

Project Final Report

Research to support the evaluation and implementation of adult cooking skills interventions in the UK: pilot RCT with process and economic evaluations [ISRCTN 91580447]

Joel Halligan^{1, 2}
Nicola O'Brien¹
Richard Purves³
Frauke Becker¹
Louis Goffe^{1, 2}
Heather Brown¹
Luke Vale¹
Deborah Stocken¹
Ashley Adamson^{1, 2}
Jean Adams^{1, 4}
Martine Stead³
Martin White^{1, 4}

Affiliations

- 1 – Institute of Health & Society, Newcastle University, UK
- 2 – Human Nutrition Research Centre, Newcastle University, UK
- 3 – Institute of Social Marketing, University of Stirling, UK
- 4 – UKCRC Centre for Diet and Activity Research (CEDAR), MRC Epidemiology Unit & University of Cambridge, UK

Address for correspondence

Name: Prof Martin White

Role: Programme Leader, Food Behaviours and Public Health Interventions

Institution: Centre for Diet & Activity Research (CEDAR), MRC Epidemiology Unit

Address: University of Cambridge, School of Clinical Medicine, Box 285, Institute of Metabolic Science, Cambridge Biomedical Campus, Cambridge, CB2 0QQ

Email: martin.white@mrc-epid.cam.ac.uk

This research was undertaken by Newcastle University and University of Stirling on behalf of the Public Health Research Consortium. The Public Health Research Consortium is funded by the Department of Health Policy Research Programme. The views expressed in this report are those of the authors and not necessarily those of the DH. Information about the wider programme of the PHRC is available from <http://phrc.lshtm.ac.uk/>.

Contributors

MW, AA and JA had the idea for the study and, with MS, JH, HB, LV, NO and DS, developed the study design and secured funding. The methods were further developed by all authors and fieldwork was undertaken by JH, RP, MS, NO and FB. Quantitative data was analysed by JH, LG and FB, with support from JA, MW, NO, DS, HB and LV. Qualitative data was analysed by RP and MS. DS and JA provided statistical advice, LV and HB advised on economic evaluation, and MS advised on qualitative analyses. All authors contributed to data interpretation. The project was managed overall JH, supported by JA, AA, MS and MW. The report was drafted by JH, NO, RP, FB, MS, JA and MW. All authors commented on drafts and approved the final version. MW is guarantor for the work.

Acknowledgements

This work would not have been possible without the help and support of a number of individuals and organisations. First and foremost, we are extremely grateful to the Jamie Oliver Ministry of Food (JOMoF) centres in Bradford, Leeds, Newcastle upon Tyne and Stratford for agreeing to work with us on this project. Without the consent and co-operation of each of their respective project managers (Simon Chappelow, Joanna Lacey, Carlos Montes & Soraya Overend), food trainers and volunteers, it would not have been possible to manage the logistics of the study, recruit participants, place participants onto courses, observe classes, or obtain information needed to permit the study to progress. We are also grateful to Ali Barker, Camilla Cameron, Neil Lovell, Rosanna Bluett and Mandie Turner at the Jamie Oliver Food Foundation who have provided support and guidance with the formation, design and setup of the study, and who have helped us form links with each of the JOMoF centres.

Secondly, we are indebted to those organisations and individuals who agreed to help us with providing access to, and recruiting participants for, the study: Tara Benn and Maureen Lillywhite at Zest – Health for Life in Leeds, David Wakefield and Malcolm Bell at Stagecoach Bus in Newcastle, Jenni Duncan at DB Regio in Newcastle, Jonnie Thelwell at ‘Eccy Meccy’ in Bradford, Bradford Metropolitan District Council and the West Ham United Foundation.

We are grateful placement students Stella Panagio-Breining and Ellie Parrott who assisted with data entry, and the project secretaries Anosua Mitra, Lisa McClure and Astrid McIntyre who provided secretarial and administrative support at different times during the project.

Finally, we would like to express our immense gratitude to the participants who took part in this research project, without whom none of this work would have been possible.

CONTENTS

I	PREFACE: WHAT THE STUDY ADDS TO KNOWLEDGE	6
II	POLICY IMPLICATIONS	7
III	EXECUTIVE SUMMARY	8
IV	STUDY OVERVIEW	18
V	STUDY METHODS AND RESULTS, BY WORK PACKAGE	28
1.	Work Package 1 – analysis of NDNS data	28
1.1.	Background	28
1.2.	Methods	29
1.2.1.	Data source	29
1.2.2.	Inclusion criteria	30
1.2.3.	Variables of interest	30
1.2.4.	Statistical analysis	31
1.2.5.	Ethics	31
1.3.	Results	31
1.4.	Discussion	38
1.4.1.	Summary of results	38
1.4.2.	Strengths and limitations of methods	38
1.4.3.	Interpretation and implications of results	39
1.5.	Conclusion	41
2.	Work Package 2 – analysis of course manual & intervention observations	42
2.1.	Background	42
2.1.1.	Behaviour change techniques	42
2.1.2.	Fidelity	42
2.2.	Methods	43
2.2.1.	Manual analysis	43
2.2.2.	Observation form development	44
2.2.3.	Observations	45
2.3.	Results	46
2.3.1.	Manual analysis	47
2.3.2.	Observations	52
2.4.	Discussion	64
2.4.1.	Summary of principal findings	64
2.4.2.	Strengths and limitations	64
2.4.3.	Interpretations and implications	66
2.5.	Conclusion	69
3.	Work Package 3 – pilot RCT	72
3.1.	Background	72
3.2.	Aims and objectives	72
3.3.	Methods	73

3.3.1.	Recruitment	74
3.3.2.	Sample size and randomisation	77
3.3.3.	Outcome measures	77
3.3.4.	Intervention & control condition	78
3.3.5.	Data collection points	78
3.3.6.	Data collection methods	79
3.3.7.	Data entry	80
3.3.8.	Qualitative study	82
3.3.9.	Data management	82
3.4.	Results	82
3.4.1.	Primary outcomes - recruitment, retention and attrition	82
3.4.2.	Process measures	88
3.4.3.	Participant & stakeholder views on study recruitment and participation	91
3.4.3.1.	Participants' views and experiences of the recruitment process	91
3.4.3.2.	Factors influencing participants' decisions to participate	93
3.4.3.3.	Stakeholder motivations for taking part in the research	97
3.4.4.	Participants' and stakeholders' views and experiences of the research methods	97
3.4.4.1.	Participants' views and experiences of the research methods	98
3.4.4.2.	Stakeholders' views and experiences of the research methods	100
3.4.5.	Secondary outcomes – socio-demographic characteristics, cooking skills and diet	102
3.5.	Discussion	114
3.5.1.	Summary of principal findings	114
3.5.2.	Strengths and limitations	115
3.5.3.	Interpretations and conclusions	117
3.6.	Conclusion	120
3.6.1.	Implications for future research	121
4.	Work package 3 – qualitative study	122
4.1.	Background	122
4.2.	Aims and objectives	122
4.3.	Methods	122
4.3.1.	Recruitment for qualitative study	122
4.3.2.	Achieved sample	123
4.3.3.	Analysis	123
4.4.	Results	123
4.4.1.	Study participants' experiences and attitudes to cooking, diet, food, and food shopping	123
4.4.2.	Attitudes towards and acceptability of cooking skills interventions	133
4.4.2.1.	Participants' perspective	133
4.4.2.2.	Stakeholders' perspectives	138

4.4.3.	The consequences of cooking skills interventions for UK adults	140
4.5.	Discussion	156
4.5.1.	Summary of principal findings	156
4.5.2.	Strengths and limitations	158
4.5.3.	Interpretation and conclusions	158
4.6.	Conclusions	159
5.	Work package 4 – pilot economic evaluation	160
5.1.	Background	160
5.2.	Aims	160
5.3.	Methods	160
5.3.1.	Data Collection Methods	160
5.4.	Results	161
5.4.1.	Costs of delivering the intervention	161
5.4.2.	Costs to Participants	163
5.4.2.1.	Response Rates and Number of observations	163
5.4.2.2.	Costs to Participants	164
5.5.	Discussion	165
5.5.1.	Summary of principal findings	165
5.5.2.	Strengths and limitations	165
5.5.3.	Interpretations and conclusions	165
VI	OVERALL DISCUSSION AND CONCLUSIONS	167
VII	RECOMMENDATIONS FOR A DEFINITIVE TRIAL	173
VIII	APPENDIX	176
IX	REFERENCES	184

I Preface: What the study adds to knowledge

This study adds to the evidence base around cooking skills and cooking skills interventions, including knowledge on the prevalence and patterning of cooking skills in the general population in the UK, the theoretical basis and likely feasibility of a cooking skills intervention, the feasibility of a randomised controlled trial (RCT) of a cooking skills intervention, and the likely approach for conducting an embedded economic evaluation.

The results of work package (WP) 1 – analysis of the UK’s National Diet and Nutrition Survey – has established that the prevalence of self-reported cooking skills in the UK is high and that a majority of respondents say they are confident at cooking a meal from basic ingredients. However, prevalence of cooking skills was socio-demographically patterned, suggesting some groups may be more in-need of cooking skills than others. This WP also highlights the difficulties in accurately measuring cooking skills and the potential biases in asking people to self-report their cooking skill ability.

The results of WP2 – analysis of the course manual and observations of intervention classes – adds to the knowledge base around the theoretical basis, and likely ‘active ingredients’, of a cooking skills intervention, in addition to the behaviour change techniques that might be reasonable to incorporate into a structured cooking skills intervention. The observations add to the evidence base around the challenges of evaluating of cooking skills, and similar, interventions.

The results of WP3 – pilot RCT including qualitative study – add to the knowledge base around the feasibility of conducting a definitive RCT of a cooking skills intervention. We have established that: recruitment of those identified as ‘most in need’ is possible; that randomisation to an intervention or control arm is feasible; that levels of loss to follow-up are not likely to be prohibitive of a definitive trial; and that the methods of data collection are feasible, including 24-hour recalls to collect dietary data and a questionnaire to collect other data around cooking skills and wider impacts. The qualitative study adds to the evidence base about the acceptability of cooking skills interventions and their likely impacts, from the perspective of both participants and stakeholders. This knowledge will be useful for those designing future interventions or evaluation of cooking skills interventions.

The result of WP4 – pilot economic evaluation – highlight some of the difficulties in collecting cost data, both from participants and from intervention providers who are not under jurisdiction of the research team. These data add to the knowledge base of likely response rates for collecting grocery spend data from participants.

II Policy implications

The results of this research contribute to the government's ambition to increase the evidence base for a range of comprehensive and integrated 'real-life' interventions. Present and future governments may increasingly seek to implement such interventions in order to contribute towards influencing a downward trend in overweight and obesity.

However, evaluation of such 'real-life' interventions can be fraught with potential challenges and complexities, for example: beginning an evaluation of an intervention that subsequently proves to be ineffective; encountering difficulties in recruiting and retaining participants; not recruiting the right socio-demographic participant group; not being able to collect the necessary data from participants; and not having an understanding of important contextual factors likely to impact upon both the success of the intervention itself and its evaluation. All of these potential difficulties may lead to the costly failure of a large-scale evaluation, which is why pilot and feasibility work is crucial when uncertainty exists around the intervention and evaluation design and methods.

This research therefore highlights the value and cost-effectiveness of pilot and feasibility work preceding large-scale, definitive trials of complex public health interventions.

III Executive summary

Background

The UK's current obesity endemic requires practical interventions that can reduce the significant health, social and economic burdens of obesity on society.

The current literature exploring the inter-relationships between home-cooked food, convenience food, and dietary outcomes, is equivocal.¹⁻⁶ Relationships between time spent on food preparation and socio-demographic variables appear to be complex, with full-time employment, low income and being male all associated with less time spent cooking.^{3 6-8}

Because of the hypothesised lack of cooking skills in the general population, the last decade has witnessed a rise in the number of interventions developed to address this perceived skills gap. However, there has been little consideration of their theoretical basis and few rigorous outcome evaluations or translational studies.⁹

Two reviews of cooking skills interventions have both concluded that no evidence to-date is robust enough to conclusively determine that such interventions can influence dietary outcomes.^{9 10} Based on these reviews, we recommended that a definitive outcome evaluation should be conducted, but that these should be preceded by a pilot study to overcome any methodological limitations.¹¹ Jamie Oliver's Ministry of Food (JOMoF) was identified as the most suitable cooking skills intervention with which to collaborate on an RCT because of its scale and sustainability.

Aims

The overarching aim of this programme of research was to establish the feasibility of conducting a definitive RCT of a cooking skills intervention (JOMoF). Sixteen research questions are addressed within four linked work packages (WP).

A summary of the aims of each WP is provided here and the research questions in subsequent chapters:

- WP1 – explore the prevalence of cooking skills in the UK, and associations between cooking skills and diet quality and body weight
- WP2 – establish whether the intervention is feasible and worth evaluating
- WP3 – establish whether the methods proposed for a definitive RCT are feasible, and whether both the methods and the intervention itself are acceptable to participants and stakeholders
- WP4 – establish whether the methods for economic evaluation of a definitive RCT are feasible.

Intervention background

The JOMoF cooking skills course in the UK (the intervention) is an 8-week, 8-session course which aims to impart basic cooking skills and techniques, as well as provide nutritional, hygiene-related, and food ethos information to all participants.

Ministry of Food centres currently exist in Rotherham, Leeds, Bradford, and Newcastle upon Tyne. All of the current centres are located in large urban areas with high levels of deprivation.¹²

Work Package 1 – analysis of NDNS data

Background

The aim of this work package was to provide up-to-date information on the prevalence and socio-demographic correlates of cooking skills in UK adults.

Methods

We conducted a cross-sectional analysis of data from wave 1 of the UK National Diet and Nutrition Survey (NDNS) (2008-9).¹³ Socio-demographic variables of interest were sex, age, socio-economic position (NS-SEC) and main food provider (MFP) status. Cooking skills were assessed in three ways - confidence in using eight cooking techniques, confidence in cooking ten foods, and ability to prepare four types of dish.

Results

In total, 509 respondents and 493 MFPs from 509 households were included in the analysis.

Almost two thirds of respondents said they prepared a main meal on most days of the week, whilst more than four fifths lived in a household where the MFP said they did so. Women and respondents who were MFPs were more likely to report cooking a main meal on most days.

Three-quarters, or more, of respondents reported confidence with using each of the eight techniques that were asked about, except stir-frying. At least 90% of respondents reported confidence with boiling, grilling, and oven-baking or roasting.

More than 90% of respondents reported being able to prepare a meal from ready-made ingredients without help, with 89.2% reporting being able to do the same for a main dish from basic ingredients.

Discussion

We are confident that this is the most population-representative data on cooking skills currently available in the UK.

With a few notable exceptions, we found high prevalence of self-reported confidence with using a range of cooking techniques and cooking a range of foods and dishes in both respondents and household MFPs.

Differences in reported cooking confidence across socio-demographic variables were scattered and inconsistent. Where these were found, in general women and respondents who were also MFPs were most likely, and those in the youngest age group (19-34 years), men and lowest socio-economic group were least likely, to report confidence.

The complexity of the phenomenon of 'cooking' has been noted.^{14 15} It is unlikely that the simple questions used here adequately capture this complex construct. A simple, but comprehensive, measure of cooking skills is required for population monitoring.

Our results suggest that most UK adults do not perceive themselves to be lacking cooking skills. Despite high prevalence of reported cooking skills, we found that these skills are not necessarily being frequently used. For example, whilst almost 90% of respondents reported being able to prepare a meal from basic ingredients without help, only two-thirds did so five times a week or more.^{16 17}

The few socio-demographic differences in self-reported cooking skills that were present suggest that any attempt to recruit adults to cooking skills interventions may find it useful to focus on recruiting men, those younger than 35 years, and those in the least affluent socio-economic groups.

Work Package 2 – analysis of course manual & intervention observations

Background

BCTs

Behaviour change techniques (BCTs) are observable and replicable, practical methods that can enhance the effectiveness of behaviour change interventions, by impacting upon the causal processes that lead to a particular behaviour.^{18 19} To help with intervention development and classification, and to increase standardisation of descriptions of interventions, taxonomies of BCTs have been developed.¹⁹⁻²¹

To establish whether the intervention was using any BCTs, we used the 40-item, CALO- (BCT) taxonomy to review the JOMoF cooking skills course manual.¹⁸

Fidelity

Understanding the fidelity of an intervention is critical to understanding the reasons for its success, or failure, in achieving its desired aims.²² Fidelity can be influenced by quality of preparation and planning, delivery and engagement.^{23 24}

We assessed whether the intervention was implemented as intended (according to the intervention manual), whether there were variations in delivery style and content, whether participants were engaged during intervention delivery, and whether any of these elements varied between JOMoF sites, instructor, or point in the curriculum.

To undertake this process of comparison of classes, both against the manual and against each other, we conducted in-person observations of classes, using a bespoke observation form.

Methods

Manual analysis

The BCTs of the cooking skills intervention were identified by coding the course manual.

In addition to this, we also extracted information relating to the structure and content of the course, in terms of nutritional messages, ethos, and practical skills such as chopping, cooking and shopping or budgeting. From this, an observation form was developed.

Observation form development

Direct, in-person observations allowed us to ascertain which BCTs and messages were being used, and whether the structure was also as described in the course manual. The observations also allowed us to establish whether additional BCTs were used that were not identified in the course manual.

The development of the observation form was an iterative process, consisting of three rounds of drafting, piloting in sessions and revisions.

Observations were conducted at three JOMoF centres. In total, 12 sessions were selected for observation.

Results

Manual analysis

After systematically coding each session outline from the manual, we concluded that some BCTs were most likely present in the course. The techniques identified were typically repeated across most sessions. Seven techniques were described in the manual across the majority of the sessions:

- Provide information on the consequences of the behaviour in general
- Goal setting – behaviour
- Prompt review of behavioural goals
- Prompting generalisation of target behaviour
- Provide instruction on how to perform the behaviour
- Model/demonstrate the behaviour
- Prompt practice

Observations – BCTs

Information about cooking skills and techniques was consistently provided, with information about nutrition, ethos, shopping and budgeting advice, and the benefits of cooking from scratch, less consistently provided.

The BCTs that were most consistently seen in the observations were included in the seven identified in the manual, except for ‘Goal setting’ and ‘Prompt generalisation of target behaviour’.

Observations – nutrition messages

The most consistent nutrition messages related to the balanced plate and portion sizes. There were also frequent mentions of carbohydrates and their role in a balanced diet, sources of fat in the diet, the benefits of 5-a-day and ways to incorporate more fruit and vegetables into the diet, and salt and its recommended level of intake. However, there was inconsistency both within and between sites in the way that nutritional messages were incorporated.

Observations – class structure

The basic structure of the class was similar across sites, with each session beginning with a brief introduction and followed by a demonstration which involved participants practising alongside the instructor, or a more staggered segmenting with participants practicing in between demonstration segments. The overall length of classes and the time dedicated to participant practice varied between classes and both between and within sites.

Observations – teaching style & participant engagement

The styles of teaching differed slightly between centres and also within centres. Some instructors had a more didactic style, whilst others possessed a more interactive style. Some parts of the sessions observed also seemed to naturally lend themselves to more interaction and engagement with participants.

The apparent interest of participants and their engagement with the course appeared to be good, although interaction between participants varied to some extent.

Discussion

The results of the manual analysis, coupled with the observations, have helped us to establish that BCTs are present in the course, and may impact upon behaviour change.

The observations revealed that there were some elements of the course that were observed as being consistently delivered across all centres, and some other elements that were less consistent between centres.

However, the number of observations that we conducted – 12 sessions were observed in total – was only small. Because of this small sample, there remains the possibility that the variability that we captured was unusual, and that further observations would have resulted in us seeing greater consistency between and within centres.

We determined from the observations that there were variations in intervention fidelity. Some of these differences may be attributable to contextual differences between the intervention's host organisations, while some may be attributable to individual instructors' background and experiences.

Whilst elements of the course content may vary between and within centres, the need to precisely standardise all elements of a complex intervention has been questioned; it is suggested that identification and consistency of the key components may be more important.^{25 26} Manualisation of an intervention, effective training of intervention deliverers, and regular monitoring may improve consistency.²⁵⁻²⁷

Based upon our observations and analysis of the course manual, we have made suggestions for where improvements could be made to the intervention to improve its effectiveness. We have suggested that JOMoF conduct a review of the course manual in order to streamline its content, focusing on providing the core messages only, and highlighting and formalising the use of BCTs. We have also made suggestions for where additional BCTs could be incorporated into the intervention that would potentially improve its effectiveness.

Overall, we observed that the intervention shows promise as an intervention that can be evaluated and has the potential to be effective at improving cooking skills. Although some differences between and within centres were observed, we have not deemed these to be so great as to threaten the evaluation potential of the intervention as part of a definitive trial.

Prior to commencing a definitive trial, further work would need to be undertaken, in partnership with JOMoF, to revise the manual and agree on the 'active ingredients' of the intervention.

Work Package 3 – pilot RCT

Background

The purpose of the pilot study was to test the proposed methods to ensure that they are feasible, practical and fit for purpose, to determine the sample size needed for a definitive trial, and to refine the outcome measures to be used in a definitive trial.

Aims and objectives

For the pilot study, we aimed to recruit 96 participants: 48 to be allocated to the intervention arm, and 48 to be allocated to a wait-list control arm. These participants were to be recruited via two routes: directly from the community (community participants); and from the existing JOMoF wait-lists (wait-list participants). Follow-up data were collected at 4-weeks post-intervention.

The primary outcome measure for the pilot study was to assess whether a definitive trial would be feasible using the same or similar methods of data collection and study procedures, assessing factors

affecting recruitment, retention and attrition, as well as practical and methodological issues that are likely to affect the success of a definitive RCT, such as non-compliance with data collection methods.

Methods

For the community recruitment, we developed and piloted recruitment methods to target those most in need; based on the results of WP1 we targeted males and people from more deprived communities. For the wait-list recruitment, we wrote to participants on the existing waiting lists for a JOMoF course.

Upon recruitment, participants were randomly allocated to one of two dietary data collection methods: three day food diaries or three x 24-h recalls. Participants also completed a questionnaire that was developed using a mixture of adapted existing instruments and newly constructed questions. Upon completion of baseline data collection, community participants and wait-list participants were randomised to either take part in the next available cooking skills intervention course at their chosen site – the intervention arm – or to wait approximately 16-20 weeks to begin a cooking skills intervention course at their chosen site – the control arm.

Results

Recruitment & retention

Recruitment took place over a 10-month period and was staggered by site. Two of the original centres (Alnwick and Rothbury) closed during the recruitment period, which resulted in changes to the original recruitment schedule. The target for the recruitment was 96 participants – 16 per each of the six sites – but this was not achieved due to the loss of two sites; the final number of participants recruited was 80. Approximately one third of participants were lost to follow-up, mainly either because they could not be contacted or they failed to attend any of the course. Most participants attended at least three-quarters of the 8 intervention classes.

Data collection

We compared the number of missing days of data at baseline and follow-up for both dietary data collection methods. At both time points, the actual numbers and proportion of missing days were small.

Some telephone diet recall interviews had multiple attempts before successful contact was made. The mean total researcher time needed to collect, clean and input the data was 170 minutes and 145 minutes for the 24-hour recall method and 3-day food diary method respectively. Our data also suggest that completing a food diary may, overall, be slightly more burdensome for participants.

Participants' and stakeholders' views of the research process

Community groups and workplaces appeared to have been a particularly effective recruitment setting. These participants felt that this made attending the course easier because the participants knew other people who would be on the course. The use of free food samples and cooking demonstrations appeared to be a good way to engage with potential participants.

Participants described a range of motives for participation in the study, including the opportunity to refresh knowledge and skills, to learn basic cooking skills, to learn more about how to eat healthily and as a social or leisure activity. For those who were already interested in and fairly confident about cooking, the course presented an opportunity to refresh their knowledge and skills and to garner some new ideas. For those participants who were less experienced and less confident about cooking, a key motive for participation was to learn some basic skills.

Generally, participants reported that they had not found it difficult to commit to the course. Participants appeared to have enjoyed participating in the study and not to have found the experience too onerous. In general, the participants did not find the concept of a waiting list control group to be a problem and accepted it was part of the study.

The stakeholders believed that taking part in an evaluation was very important for the future success of the cooking skills course. Stakeholders were also keen to stress how the course had developed since its inception and how evaluation could play an important role in developing the course in the future.

Stakeholders were motivated to take part in the study by a desire to establish an evidence base which would be used to measure the course against its agreed outcomes. Stakeholders also viewed the possibility of a definitive trial positively.

Socio-demographic characteristics and baseline cooking skill

The majority of community-recruited participants were male, aged over 30 years, white British, possessed only secondary level education and resided in areas with high levels of socio-economic deprivation. The small sample of participants recruited from the wait-list were mainly female, slightly younger than the community participants, came from smaller households in less deprived areas and had greater responsibility for shopping, meal choice and cooking.

Only around half of the sample reported being confident at cooking from basic ingredients, although around three quarters said that they were confident at following a simple recipe. Between 50% and 60% of participants said that they could prepare a main meal from basic ingredients 'with no help at all', and very few participants reported preparing a main meal 'from scratch' on every day of the week.

Between baseline and follow-up we observed increases in the proportion of participants in the intervention arm who reported being able to prepare a main meal 'from scratch' with no help at all, and in the proportion of participants in the intervention arm who report preparing a main meal from basic ingredients four to six times a week, compared to the control arm.

Dietary intake

At baseline, median intake of fruit and vegetable (FV) portions differed slightly between intervention (2.6 portions/day) and control arm (2.9 portions/day) participants, despite both arms being balanced in terms of socio-demographic characteristics; the reasons for this difference are therefore unclear.

Discussion

This study successfully managed to recruit participants identified as most likely to be most-in-need of a cooking skills intervention. We also successfully piloted recruitment via a number of different channels; these recruitment channels successfully identified a higher proportion of participants potentially in need of a cooking skills intervention than in the general population, and also managed to retain a relatively high number of participants at follow-up compared to other cooking skills interventions.^{10 28}

The study retained more participants than predicted – 69% vs 65%. The pragmatic decision to pilot a follow-up period of 4 weeks rather than 12 months may give an underestimation of the proportion of participants that would be lost to follow-up in a definitive trial with a longer follow-up period. The evaluation of the Australian Ministry of Food programme achieved a follow-up rate of 31% in its intervention arm at 6-month follow-up.²⁹

The findings suggest that a definitive study of a cooking skills interventions is feasible, using community recruitment, randomisation to a wait-list control group and collection of data using questionnaires and food diaries or 24-hour recalls. However, allocation to a 12-month waiting list control group may not be as successful at retaining a similar number of participants as were followed-up in this pilot study. An alternative control condition would be worth considering prior to a definitive trial.

Work Package 3 – qualitative study

Background

Qualitative research was conducted with intervention participants and stakeholders to explore the feasibility and acceptability of the intervention and research methods, and to explore factors influencing successful implementation of the intervention and research methods, and engagement in both.

Methods

Participants were purposively sampled to achieve maximum socio-demographic variation. Key stakeholders of the cooking skills intervention were identified during informal discussions with JOMoF.

Ten individual interviews and five focus groups were conducted with participants. The interview sample comprised five females and five males. Focus group sizes ranged from 2-5 (19 participants in total, 13 of whom were male and 6 female).

Six stakeholder interviews were conducted, representing three of the JOMoF centres and Jamie's Food Foundation.

Analysis of interview transcripts was guided by the Framework approach.

Results

Participants differed in their feelings about cooking and their motives for doing it. For some, it was a necessary and sometimes boring task which they wanted to make easier or more interesting, while others described it as something they "loved" and did frequently. A broad range of levels of confidence in cooking and preparing meals prior to the course was observed amongst the participants. A range of potential benefits from cooking were recognised by the course participants, including cost effectiveness and saving money; relaxation; and knowledge of the food consumed.

Prior to undertaking the cookery training, course participants varied greatly in their cooking habits. At one extreme, participants were consuming microwave meals only, whilst at the other, they described a wide selection of dishes which they prepared regularly. Work activities and living circumstances had an impact on cooking behaviour. Certain participants stated that they were aware they possessed food preparation skills, but the time-saving benefits of shortcuts were appreciated.

The factors influencing home food preparation behaviour were found to be similar to those affecting dietary intake. Potential difficulties in cooking for only one person were recognised by course participants, particularly in terms of cost-effectiveness, and levels of motivation. Some households struggled to find dishes that everyone would consume, especially if members of the family had entrenched eating habits or children were very selective eaters.

In general, the participants stated that they enjoyed taking part in the course, with many reporting how much they learned throughout as one of the most satisfying aspects of the course. Beginners and more experienced cooks alike felt that they gained something from the course.

Unsurprisingly, given the generally high levels of enjoyment associated with taking part in the course, an increased or renewed enthusiasm for cooking was described by several respondents. Perhaps reflective of the emphasis placed on technique and skills in the course, several participants reported having learnt and put into practice new ways of chopping and preparing ingredients. Several participants described how the course had made them think more about what food they bought and how they shopped.

Some participants had suggestions for how the experience could be improved, such as the possibility of a follow-up course, the receipt of a certificate at the end of the course, greater emphasis on cheaper ingredients and information about cooking on a budget, and provision of calorie information.

Experience of trying to replicate the dishes taught on the course at home was varied. A few had not attempted any of the dishes since completing the course, and several said that they were 'thinking about' or 'would probably' try some of the dishes again at home, but had not done so yet. A few participants described how, following the course, they had moved enthusiastically away from reliance on ready-made ingredients, towards more cooking from scratch. However, for others, there was still a tendency to rely on some processed ingredients. A few participants described having adopted healthier food preparation techniques such as reduced use of fat and salt and less frying.

Finally, a few participants mentioned other benefits from participating in the course that were not specifically related to cooking or diet, such as a break in daily routine and as a pleasant social activity.

Discussion

The qualitative interviews contributed to our understanding of participants' baseline cooking skills and feelings about cooking. A range of factors influencing cooking were identified, including cost, time, and work patterns.

The qualitative findings provide insight into the types of impacts and outcomes that might be experienced and could potentially be measured in a definitive trial. They also provide insight into how concepts such as 'increased confidence' and 'skills' can be understood.

The qualitative findings suggest that participants potentially took several different types of cooking, nutritional and food purchasing information and advice from the intervention, and that the cooking skills course as presently delivered is communicating a very wide range of information and advice, and that greater effectiveness may be achieved by focusing on a few key salient themes.

Any future definitive RCT should include a qualitative element to explore participants' engagement with the intervention and their perceptions of its impact.

Work Package 4 – pilot economic evaluation

Background

In a definitive trial the collection of expenditure data from participants and cost data from the JOMoF centres will be used to determine the costs of providing the cooking classes.

Aims

The principal aim of the economic analysis was to determine if an economic evaluation of a cooking skill intervention is feasible using the same or similar methods of data collection explored here.

Methods

A template was developed to collect the costs required to deliver the intervention.

The costs to participants of weekly food expenditure in the home and outside of the home, as well as kitchen equipment expenditure, were collected by a participant-completed questionnaire at baseline and at 4 week follow-up.

To validate the collection of these self-reported measures, participants were asked to provide receipts for their food shopping at both baseline and follow-up.

Results

Collecting this data proved challenging. The level of detail provided by each of the centres varied substantially. Because of the heterogeneity in data collection we cannot provide an estimate of the likely costs of delivering the intervention to inform a definitive trial.

The response rates between treatment and control group were reasonably similar for all the variables with the possible exception of food expenditure receipts. At follow-up approximately 44% of respondents who provided receipt information at baseline provided receipt information at follow-up. Similarly, at follow-up approximately 70% of respondents provided self-reported expenditure data if they had provided this data at baseline.

Discussion

The unsuccessful attempt to collect data from all of the sites meant that we cannot provide a feasibility estimate of possible costs associated with delivery of the intervention to inform a definitive trial.

The response rates for self-reported expenditure were reasonably high (70%) in both the control and treatment groups suggesting that this is a feasible method for data collection which could be used in a definitive trial.

Validation of the self-reported expenditure data through the use of receipts proved to be more challenging as response rates were lower at 44%. However, this rate is consistent with other studies that have elicited receipt data from participants, when controlling for participation rates in the study from the total eligible population. Receipt collection rates in the literature range from 20% to 70%.³⁰

³¹

The feasibility study provided useful information for the development of data collection tools for an economic evaluation in a definitive trial. Specifically we have identified approaches to limit the burden of data collection falling on participants and centres. These approaches should allow the required cost data to be collected and minimise missing data and loss to follow-up of participants and centres.

IV Study overview

a) Background

The challenge of obesity requires practical interventions that can reduce the significant health, social and economic burdens of obesity on society. In the UK, obesity prevalence is socio-economically patterned.³² As well as being linked to obesity, poor diet quality is also independently linked to an increased incidence of many chronic diseases, including cardiovascular disease, some cancers and dental caries.³³⁻⁴¹ The primary driving force behind growth in prevalence of obesity is excess dietary intake. Moderating dietary energy intake is therefore a significant global challenge.

Interventions that can lead to these positive dietary changes are being sought at both a national and international level.⁴²⁻⁴³ It is recognised that the drivers of food choice, and barriers to healthy eating, are complex,⁴⁴⁻⁴⁵ but increasing attention is being given to cooking skills, and whether improvements to cooking skills could contribute towards individuals consuming a healthier diet.⁴⁶⁻⁴⁸

There is ongoing debate as to whether home-cooked food is healthier, and cheaper, than convenience foods, and whether too much emphasis is placed upon cooking ‘from scratch’. A recent Scottish study which compared home cooked dishes with equivalent ready meal dishes found no difference in macronutrient profile or cost between the two meal types.¹ However, other studies have found associations between home-cooking behaviours and time spent on home-cooking, and healthfulness of the diet,³⁻⁵ and also between ready-meal consumption and excess energy intake.⁶ Relationships between time spent on food preparation and socio-demographic variables appear to be complex, with full-time employment, low income and being male all associated with less time spent cooking. However, males from smaller households are more likely to prepare food than those from larger households, and higher ready-meal consumption is reported in those with lower incomes and lower educational attainment.³⁻⁶⁻⁸ However on balance, the literature to-date suggests that home-cooking is likely to be associated with an increase in the healthiness of overall diet quality.

Anecdotal evidence has suggested that, with respect to cooking skills, there has been a deskilling of the UK adult population over the last three to four decades. This has been attributed to increasing ownership of labour-saving devices, increased employment of women, and growth and innovation in the convenience food sector.⁴⁹⁻⁵⁰ These factors are hypothesised to, in part at least, have resulted in a growing proportion of adults who lack the necessary skills or confidence to prepare food from raw ingredients (‘from scratch’).

However, some have suggested that a lack of cooking skills *per se* may not be as critical an issue as it is often purported to be, and that of greater importance may be the time that individuals and families have available to dedicate to food preparation. This lack of time may be either real or perceived, with some, most likely wealthier households, choosing to prioritise other activities over time dedicated to food preparation, whilst the working poor, and families that are particularly time-constrained, such as single-parent families, may genuinely not have the time available that is needed to prepare foods from basic ingredients, instead having to either opt for ready-prepared ingredients or convenience foods in order to provide food within the time that is available. Therefore, the decision to use pre-prepared ingredients and convenience foods may have quite different drivers in different socio-economic groups, and may not be as simple as a lack of basic cooking skills.⁵¹⁻⁵³

The UK’s Low Income Diet and Nutrition Survey (LIDNS) found that around 5% of children and 12% of adults lived in a household where the main food provider did not feel able to “prepare a main dish

(e.g. shepherd's pie or curry) from basic ingredients" without some help. Around 22% of adults did not have these skills themselves, and a lack of skills was more common in men and in younger adults.⁵⁴ These data were collected from the most deprived 15% of UK households in 2003-05. A smaller study, conducted in Scotland, reported that 46% of younger women, and 67% of older women, said that they chopped or sliced vegetables at least 4 times a week.⁵⁵

Because of the hypothesised lack of cooking skills in the general population, the last decade has witnessed a rise in the number of interventions developed to address this perceived skills gap.¹¹ Perhaps one of the most high profile interventions to date is Jamie Oliver's 'Ministry of Food', which, as at April 2015, is operating at four fixed sites in the UK: Bradford, Leeds, Newcastle upon Tyne, and Rotherham. Previously, there were also Ministry of Food centres in Alnwick and Stratford, east London. Cooking skills interventions typically involve adult group cooking classes, devoted to imparting the knowledge and skills necessary to cook basic, healthy meals. However, such interventions are at a relatively early stage of development from an empirical and theoretical point of view, with little consideration of their theoretical basis and few rigorous outcome evaluations or translational studies.¹¹ Given the paucity of the primary evidence base it not surprising that there is no systematic review evidence to support their wider implementation.⁹

Nevertheless, there have been encouraging findings from studies to date, suggesting that such interventions may indeed have the potential for a significant population impact.^{9 10} Cooking skills interventions are becoming widespread and, by implication of their continued funding, are deemed by many within public health to be successful in achieving their aims of improving diet. However, while the evidence to date does suggest that such interventions may indeed have potential, at the present time there have been no sufficiently robust evaluations that can demonstrate that cooking skills interventions can lead to significant dietary improvements in the general population.

The Department of Health (DH) commissioned a systematic mapping and evidence synthesis of adult cooking schools from the EPPI Centre, which was completed in July 2011.⁹ The review commissioned by DH found only five studies of cooking skills in the UK that comprised an intervention and comparison arm, and four of these five studies were beset by methodological issues or unclear reporting that made it impossible to conclusively determine whether the intervention itself had any significant impact upon dietary outcomes. The primary issues that affected these four studies included lack of randomisation, unclear reporting (such as a lack of presentation of baseline data) and a possibility of selection bias in that it was not clear whether initial differences in participants might have influenced the outcomes. Of these five cooking skills interventions, only one study was deemed rigorous enough to conclude that significant changes to diet occurred as a result of the intervention, but this was conducted in older people living in sheltered housing, thus making its results unlikely to be applicable to other populations. A similar, more recent review also came to markedly similar conclusions. This review also commented on the poor quality of process evaluation in many studies, and discussed the possibility that many interventions may indeed have the feasibility to bring about dietary change, but fail to do so because of inadequate attention paid to the barriers that participants face when trying to implement changes to their cooking habits.¹⁰

In May-July 2011 some of the authors of this report conducted a scoping exercise to explore the range and extent of current adult cooking skills interventions in England, in order to identify suitable examples that could form the subject of a definitive outcome evaluation. We recommended that a definitive outcome evaluation, involving a randomised controlled trial (RCT), a process evaluation,

and an economic evaluation, should be conducted.¹¹ A pragmatic RCT was recommended in order to establish the effectiveness of a cooking skills intervention in the general population. Such a trial would be designed to establish whether changes to diet, and changes in other variables, such as self-reported cooking skills and healthy eating knowledge, can be attributed to a cooking skills intervention. This would be achieved by identifying and controlling for, as far as is pragmatically possible, other factors which may also influence these outcomes.

Jamie Oliver's Ministry of Food (JOMoF) was identified as the most suitable cooking skills intervention with which to collaborate on an RCT because of its scale and sustainability. However, as the cooking skills intervention predated the evaluation and is provided by an external organisation, rather than developed internally by researchers, it was accepted that there would be limited scope to establish efficacy and internal validity. However, this less desirable aspect is countered by the practical need to demonstrate good external validity of the cooking skills intervention being evaluated, so that if proven effective, a scalable model of the intervention could be developed. We also recommended that any RCT should be preceded by a feasibility and pilot study because of the methodological challenges encountered by previous evaluations that had sought to evaluate cooking skills interventions. A pilot study aims to establish whether a definitive trial is practical and acceptable, and inform the choice of robust outcome measures. Additionally, exploration of intervention theory and implementation in a pilot trial allows the potential feasibility of the intervention to be established, and also permit the development of tools with which to design a process evaluation to be conducted alongside a definitive evaluation.

A concurrent evaluation of the JOMoF programme has recently been completed at its two sites in Australia,⁵⁶ permitting some comparison of outcomes with the evaluation described here; details of protocols and study materials were shared between evaluation teams in the UK and Australia to allow formulation of measures that will facilitate some cross-comparison. However, whilst the intervention in Australia bears the same name as its parent intervention in the UK and has a similar (but not identical) course content, there are crucial differences in funding, operations and local context that could potentially limit any judgements of similarity in effectiveness of the intervention between the two countries. The findings from the evaluation of the Australian JOMoF programme will be discussed in relation to the present study later on this report.

b) Purpose of conducting a pilot and feasibility study

Prior to this study, other research studies have sought to establish the benefits of cooking skills interventions, although as discussed, most have not been able to produce definitive evidence as to their potential impacts on diet. These limitations are not necessarily due to flawed research, but rather the inherent difficulties in researching 'real-life' interventions in community settings. It was because of these difficulties, which have limited previous research in this area, that it was felt that any definitive trial of cooking skills interventions should be preceded by pilot and feasibility work.

Prior to the commencement of this study, it was not clear what the prevalence of poor cooking skills is in the wider UK population. Therefore, the first step in this research was to determine the socio-demographic characteristics of UK adults with poor cooking skills in order to establish which key population groups should be targeted with cooking skills interventions. This would help us to understand both whether existing cooking skills interventions were reaching those most in need and whether it would be possible to target and recruit these 'in need' groups.

The intervention itself, whilst developed iteratively by a team at the Jamie Oliver Food Foundation, had not been explored in terms of its potential effectiveness at effecting behaviour change; an intervention that uses appropriate behaviour change theory is more likely to succeed in its aims.^{57 58} We therefore aimed to analyse the course materials of the intervention to establish its explicit and/or implicit aims, what behaviour change methods are used to achieve these aims, whether these are the most theoretically appropriate methods, and whether they are likely to be effective in achieving behaviour change. It was also not clear whether the same intervention was effectively being delivered in the same way across its different sites. From this analysis of the course manual, we therefore aimed to develop an observation form, to assess whether the intervention was being delivered as planned and whether there were any differences within and between centres that may impact upon intervention fidelity.

Whilst the systematic review completed by the EPPI-Centre found little robust evidence concerning the potential benefit of cooking skills interventions to individuals,⁵⁹ it is possible that this is not due to a lack of effectiveness, rather cooking skills interventions do not currently attract those with poor existing skills, knowledge or confidence. The EPPI-centre's review highlighted the methodological challenges that many studies had not overcome which had limited the robustness of their findings. These included: lack of a suitable control group or comparator, or for those which did include this, a lack of randomisation; lack of robust dietary measurement; omission of the reporting of key information, for example, baseline measurements and socio-demographic information of recruits and dropouts.⁹ We therefore determined that a pilot study would be critical, in order to address such methodological issues that may impinge upon the ability to conduct a definitive randomised controlled trial.

The purpose of the pilot study was thus to determine an 'acceptable' design in terms of randomisation, recruitment, retention and attrition, and data collection, and define appropriate and robust outcome measures for a proposed definitive RCT. We aimed to achieve this by:

- piloting methods for targeted recruitment of participants who are most likely to benefit from taking part in a cooking skills intervention, and assessing whether participants would accept being randomised to a wait-list control group.
- assessing the deliverability of the intervention and compliance of participants to their randomised group, and likely contamination of the control group.
- determining the most appropriate and feasible method of collecting dietary data from participants of a cooking skills intervention, at baseline, and four weeks after taking part in a cooking skills intervention. Two dietary data collection methods will be compared in terms of participant acceptability and validity of outcome measures: three day unweighed food diaries and three x 24-h multiple pass recalls
- piloting of a questionnaire developed to collect self-report data on cooking skills and cooking confidence, healthy eating knowledge, attitudes to healthy eating, barriers and facilitators to cooking 'from scratch', self-esteem and self-efficacy, and motivations for taking part in a cooking skills intervention, at baseline, and four weeks after taking part in a cooking skills intervention; the questionnaire will be constructed from validated (adapted for the intended audience) and newly-constructed questions covering the different domains

- conducting post-intervention interviews and focus groups with participants of a cooking skills intervention to establish feasibility and acceptability of the proposed research methods, and factors influencing successful implementation of the intervention and research methods, and engagement in both
- identifying the socio-demographic characteristics of cooking skills intervention participants
- conducting interviews with key stakeholders of a cooking skills intervention to gain their views on its feasibility developing and piloting an economic evaluation of a cooking skills intervention.

In the pilot study, the decision to collect data four weeks post-intervention was a pragmatic one that aimed to simulate a longer 12-month follow up period proposed for a definitive RCT, and rather than aiming to detect whether any intervention effects begin to decay after this time, the primary purpose of the four-week follow up was to give an indication of likely participant loss to follow up.

Comparison of two dietary data collection methods will help determine the most appropriate method for collecting dietary data in the proposed definitive RCT. Whilst there is evidence that 24-h multiple pass recalls may be preferred by study participants, and are particularly suitable for low-income populations where literacy may be poorer,⁶⁰ the socio-demographic characteristics of individuals who are likely to be most in need of cooking skills interventions were not fully determined. Whilst three day food diaries can be slightly more burdensome for participants, this method is less resource intensive.

To identify potential challenges that could be minimised when designing and conducting the definitive RCT, and assess the practicality of a wait-list randomised design, we also wished to conduct a process evaluation, including interviews at each of the intervention sites to explore the practicality and acceptability of the intervention and proposed research methods, and factors that may influence the success of the intervention and evaluation.

Even if the intervention were proven to be effective, in terms of both efficacy and effectiveness, is still unlikely to be implemented on a large-scale if the costs of the intervention far outweigh the benefits.⁶¹ Thus, the purpose of an economic evaluation would be to investigate the relationship between costs and benefits of an existing cooking skills intervention. This would establish whether the funding and resources needed for the cooking skills intervention could be justified from the public purse, in terms of potential improvements to health resulting from improved diet. However, given the other demands of participants in terms of dietary data and completion of questionnaires, there was uncertainty as to whether we would be able to obtain accurate cost data from participants relating to both regular grocery expenditure and incidental expenditures such as the purchase of kitchen equipment. As we would also require cost data from the JOMoF sites to calculate the cost of delivering the intervention, it was important to understand the ease of access to such data, and whether its level of detail would be sufficient to support a definitive economic evaluation.

For these reasons of uncertainty around the effectiveness of the intervention, the feasibility of the methods and the potential challenges in recruiting and retaining participants, a pilot and feasibility study was proposed to precede a definitive trial.

c) Aims

The overarching aim of this programme of research was to establish the feasibility of conducting a definitive RCT of a cooking skills intervention (JOMoF), which would, in turn, seek to establish whether the intervention can lead to changes in dietary intake of clinical or public health significance. Fifteen research questions were addressed within four linked work packages (WPs):

WP1 – analysis of a national dataset to explore the prevalence of cooking skills in the UK, their socio-demographic patterning and any relationships with diet quality and body weight

WP2 – analysis of the intervention course manual to understand its theoretical basis from a behaviour change perspective, and observations of intervention classes to explore the fidelity and evaluability of the intervention

WP3 – pilot RCT, including process evaluation and qualitative components

WP4 – pilot economic evaluation.

The aim of WP1 was primarily to inform the development of WP3, in that it would inform the recruitment strategy by identifying the socio-demographic characteristics of those identified as most in need of cooking skills, and help to establish whether those who were currently self-selecting to cooking skills courses aligned with those who were identified as most in need.

It was planned that WP2 would run concurrently with WP1 and WP3, so that the observations could be timed to coincide with data collection visits in the localities of each of the centres. This was for convenience, as opposed to wanting to observe classes where research participants may be present.

WP3 was to be informed by the results of WP1, which would guide its recruitment strategy. Based upon these results, a strategy for recruitment that targeted the socio-demographic characteristics of those most in need was to be formulated, and the study advisory group engaged to discuss effective methods of recruitment. The data needed for WP4 was to be collected as part of the data collection for WP3. The qualitative work that was part of WP3 was planned to coincide with some of the observations for WP2, to maximise researcher efficiency.

d) Research questions

WP1 – explore the prevalence of cooking skills in the UK, and associations between cooking skills and diet quality and body weight

- 1. What proportion of the UK adult population report poor or limited cooking skills?*
- 2. What are the socio-demographic characteristics of UK adults reporting poor cooking skills?*
- 3. Is there a relationship between poor cooking skills in UK adults and either diet quality or body weight, after taking into account of socio-economic variables such as age, gender and socio-economic position?*
- 4. Does any relationship between poor cooking skills and diet quality or body weight vary according to socio-demographic variables such as age, gender and socio-economic position?*

WP2 – establish whether the intervention is feasible and worth evaluating

- 5. What is the theoretical basis, in terms of behaviour change, of the JOMoF cooking skills intervention?*
- 6. What is the fidelity of the JOMoF cooking skills intervention?*
- 7. Are there temporal or locational variations in intervention fidelity?*

WP3 – establish whether the methods proposed for a definitive RCT are feasible, and whether both the methods and the intervention itself are acceptable to participants and stakeholders

8. *What are the baseline self-reported cooking skills and socio-demographic characteristics of participants of a cooking skills intervention?*
9. *How do the baseline self-reported cooking skills and socio-demographic characteristics of wait-list recruits compare to community recruits?*
10. *Do the socio-demographic characteristics of community wait-list recruits align with those identified as most in need of cooking skills interventions from research questions 1-4?*
11. *What are the consequences, both expected and unexpected, of cooking skills interventions for UK adults, as identified by cooking skills intervention participants and providers?*
12. *How practical and acceptable are cooking skills interventions for UK adult participants as well as those involved in commissioning and delivery?*
13. *How practical and acceptable are the research methods proposed for a definitive RCT of a multi-site cooking skills intervention, for both UK adult participants as well as those involved in commissioning and delivery?*
14. *What factors may affect non-recruitment, attrition, attendance and compliance with data collection methods?*

WP4 – establish whether the methods for economic evaluation of a definitive RCT are feasible

15. *Is economic evaluation of a cooking skills intervention feasible?*

WP1 and WP4 were conducted by researchers from Newcastle University; WP2 was a collaborative effort between Newcastle University and the University of Stirling; the quantitative elements of WP3 were conducted by Newcastle University and the qualitative elements of WP3 were conducted by the University of Stirling.

e) Intervention background

The JOMoF cooking skills course in the UK (the intervention) is an 8-week, 8-session course which aims to impart basic cooking skills and techniques, as well as provide nutritional, hygiene-related, and food ethos information to all participants; further details of the intervention content are provided in chapter 2. Initially ten weeks, the course was reduced to eight weeks not long after commencement following feedback from centres and participants.

Ministry of Food was launched in 2008 in Rotherham, South Yorkshire, as a result of Jamie Oliver's personal ambition to create a network of centres devoted to reskilling large parts of the population with cooking skills. Further centres then went on to open in Leeds, Bradford, Newcastle, Alnwick and Stratford, east London.

The Ministry of Food centres are not owned or operated by Jamie Oliver or any of his businesses. Rather each centre is set up locally by local government, a third sector organisation, or both in partnership; funding is provided by, or sourced through, these organisations, not by JOFF. The local authority or third sector organisations self-fund, or use external funding, to pay Jamie Oliver's charitable trust, Jamie Oliver Food Foundation (JOFF; previously known as Better Food Foundation) a license fee which entitles them to use the branding, course materials, recipes, and also acquire some Jamie Oliver branded equipment, merchandise and marketing support. Therefore, each centre, while

branded as Ministry of Food, is effectively owned and operated independently, albeit with considerable support from JOFF.

As part of the license fee that is paid to JOFF, the centres receive training and support from a dedicated team within JOFF's head office in London, including training days and networking days where staff and project managers from each centre meet to share knowledge and ideas. The centres must agree, as part of the license, to follow the course structure that JOFF prescribes, to embody the ethos of Jamie Oliver and his organisations, and only to use approved recipes, all of which have been assessed by in-house nutritionists to ensure that they are nutritionally balanced.

A brief background and contextual data are given below for each of the four centres and localities that were involved in this research and from where participants were recruited. Brief details are also given for the two centres that were operational at the time that the research commenced, but which subsequently closed (one has now reopened). All of the centres that we worked with are located in large urban areas with high levels of deprivation.¹² **Error! Reference source not found.** provides a summary of key demographic and health-related statistics for each of the local authorities where the JOMoF centres are located.

Alnwick

The centre in Alnwick operated as part of the Alnwick Garden tourist attraction in Northumberland. This centre was anomalous in that it was located in a predominantly affluent rural area. The centre primarily attracted tourist participants who took part in short courses rather than attracting local participants for longer 8-week courses. The centre closed in the spring of 2014.

Bradford

The centre in Bradford launched in 2009, and was set up and funded by City of Bradford Metropolitan District Council (CBMDC). The centre, fitted out specifically to host JOMoF, is managed by CBMDC's Markets arm, and is located in a street-facing shop unit in the city centre's Oastler Market complex. The centre is funded by CBMDC.

Leeds

The centre in Leeds launched in 2008, and is part of Zest – Health for Life, a local health and wellbeing charity which works mainly in the deprived areas of east and north Leeds. The centre is commissioned and funded by NHS Leeds, and is located in an enclosed unit inside the city's Kirkgate Market; this centre was also purpose-built as a JOMoF kitchen.

Newcastle upon Tyne

The centre in Newcastle upon Tyne launched in 2010 and is also part of a local food, health and wellbeing charity known as Food Nation (previously East End Health). Similar to Leeds, the centre is commissioned and funded by NHS North of Tyne. The Newcastle centre has minimal JOMoF branding because it also provides its own, in-house cooking courses; it is located in Byker, an inner-city area approximately 1.5 miles east of the city centre.

Rotherham

The centre in Rotherham was the first of the Ministry of Food centres, opening in 2008. This centre was arguably the most high profile because of the eponymous Jamie Oliver television series, also set in Rotherham, which preceded its opening. This centre launched the model of

installing a purpose-built training kitchen in former retail units in town centre locations. The centre was part-funded by NHS Rotherham, the local council and the Coalfields Regeneration Trust. JOMoF in Rotherham closed in the spring of 2014, but reopened later that same year.

Stratford, Newham (East London)

This centre was the only one located outside of the North of England, and was launched in 2011. The centre was set up by local third sector organisation, Leaside Food, with funding provided by NHS Newham. This centre's funding model differed from the rest as it aimed to be financially self-sufficient within three years, rather than having a permanent reliance on external funding. The centre was located in a purpose-built kitchen located at one side of the foyer of East Ham Leisure Centre, in the town centre of East Ham (not Stratford – it was given the name Stratford because this was part of the same borough, and a more recognisable place because of the 2012 Olympic Games).

For this research, we worked with JOMoF centres in Bradford, Leeds, Newcastle upon Tyne and Stratford. We had originally intended to also work with Alnwick and Rotherham, but, as described, these centres closed during the course of the research. Stratford ceased to continue operating under the JOMoF brand shortly after the intervention group had finished their course, therefore whilst we recruited in Stratford and collected both baseline and follow-up data from participants, it was not possible to observe any classes or collect cost data from the centre.

Table 1: Comparison of key demographic and health indicators for the local authorities (LA) where the JOMoF centres are located.^{12 62}

	Population of LA	Population density of LA (000s/sq mile) ^a	% of residents non-white British	Rank of deprivation extent ^b (out of 326)	% of residents living in income-deprived household ^c	% of adults obese ^d	% of people reporting bad or very bad health ^e
Alnwick (Northumberland)	316,028	158	1.6	124	13.3	27.3	7.7
Bradford	522,452	3656	36.1	27	21.4	25.6	5.9
Leeds	751,485	3493	18.9	59	14.3	26.0	5.4
Newcastle upon Tyne	280,177	6332	18.1	35	20.2	23.9	6.8
Rotherham	257,280	2331	8.1	51	17.6	27.6	9.3
Stratford (Newham)	307,984	21803	83.3	2	32.8	25.3	5.6

a – the population density of England as a whole is 1043 persons per sq. mile; b – rank of the proportion of the LA's population living in the top decile of most deprived lower super output areas, based on multiple domains of deprivation; c – the % of residents living in an income-deprived household for England as a whole is 14.7; d – the % of obese adults for England as a whole is 24.1; e – the % of people reporting bad or very bad health for England as a whole is 5.5.

The detailed methods for each part of the project are given in their respective sections of the project.

Ethics and Governance

Ethical approval for the project was granted by Newcastle University's Faculty of Medical Sciences Ethical Review Committee on 22/08/2013 (Ref No. 00659/2013). The pilot trial is registered with the ISRCTN registry (No. 91580447). The research sponsor was Newcastle University. The research was conducted to accepted standards of health and social care research in the UK. Details of informed consent, research governance and data security procedures are given in the relevant methods sections below.

f) Preparatory work

Engagement with JOMoF

Prior to, and during, the drafting of the study protocol, we engaged with key stakeholders both at JOFF and at the JOMoF centres. The purpose of this was to gather knowledge about the course itself, the logistics of the course and the centres, anticipate the level of time and resource commitments that the centres may be able to provide, and to informally gauge the likely feasibility of our proposed methods from the stakeholders' perspectives. This engagement work led to some minor changes and adaptations to the study protocol.

Study advisory group

In order to understand more about our proposed methods, particularly in terms of potential community recruitment methods, we formed a lay study advisory group. This advisory group consisted of members of the public, some of whom were previous participants of the JOMoF cooking skills course in Newcastle upon Tyne; others were recruited via contact with local community groups.

It was also the intention that we would potentially utilise the study advisory group in the event of any major methodological challenges in conducting the pilot study, for example, failure to recruit or study participants not accepting their allocated arm (particularly if allocated to the wait-list control arm).

During the first advisory group meeting, various topics were discussed, including: where those who had done the course had found out about it; possible ways to make the course appealing to different groups, i.e. those on low-incomes or living alone; potential recruitment channels, i.e. workplaces, community groups, social media, traditional print media; and incentives to take part in the research. One of the main outcomes of the advisory group was the suggestion to have a recruitment 'stall' at events, either providing free food samples of food that would be made on the course, or giving live cookery demonstrations. Based on these discussions, a recruitment strategy was devised that incorporated these interactive elements.

V Study methods and results, by work package

1. Work Package 1 – analysis of NDNS data

This WP sought to answer research questions 1-4, which are:

1. *What proportion of the UK adult population report poor or limited cooking skills?*
2. *What are the socio-demographic characteristics of UK adults reporting poor cooking skills?*
3. *Is there a relationship between poor cooking skills in UK adults and either diet quality or body weight, after taking into account of socio-economic variables such as age, gender and socio-economic position?*
4. *Does any relationship between poor cooking skills and diet quality or body weight vary according to socio-demographic variables such as age, gender and socio-economic position?*

Questions 1 and 2 are addressed in this chapter. However, it was not possible to answer questions 3 and 4 because overall prevalence of cooking skills were low, which prevented the planned modelling of relationships between cooking skills, socio-demographic factors, diet quality and body weight from going ahead. This work package been published in the International Journal of Behavioural Nutrition and Physical Activity.⁶³

1.1. Background

Poor cooking skills may be a barrier to healthy eating and a contributor to overweight and obesity, particularly in low income groups.^{10 64 65} People who lack cooking skills may rely on convenience and pre-prepared foods.^{7 66 67} Similarly, easy access to cheap convenience and pre-prepared foods, may decrease motivation to develop cooking skills or cause existing skills and confidence to atrophy.¹⁶

Poorer cooking skills, less frequent preparation of home-cooked food, and more frequent consumption of pre-prepared foods have been associated with poorer dietary quality and overweight and obesity.^{3 5 7 54 68-70} Growing concern about a perceived lack of cooking skills has led to policy interest in adult cooking skills interventions.^{11 59}

Many interventions promoting and teaching cooking skills to adults exist at local level in developed countries.¹¹ Although some interventions report positive effects on diet,^{17 71 72} systematic reviews have found few studies reporting high quality evidence.^{10 59} The current state of the evidence makes it difficult to confirm that cooking skills interventions have a consistent, beneficial impact on diet, or body weight. This could be because: few robust evaluations have been conducted,¹⁰ interventions are not adequate to achieve such outcomes,¹¹ good cooking skills are more common than has been assumed, or a combination of these, and other, factors.

Home cooking is a complex phenomenon without an agreed definition.^{14 15 51} For example, preparing spaghetti with Bolognese sauce at home could involve: heating up a pre-prepared 'ready meal' in a microwave; boiling dried spaghetti, frying minced-beef and adding a stir-in sauce; or making spaghetti and Bolognese sauce from the basic ingredients of flour, eggs, tomatoes, minced-beef, and vegetables. Self-reported cooking skills may also be unrelated to everyday use of such skills – with individuals choosing not to cook at home because another household member takes responsibility for this, they eat elsewhere, or they do not prioritise time for cooking.¹⁶

The most recent population-representative data on adults' cooking skills in the UK were collected in 1997. This survey found almost 80% of women, but only 25% of men, cooked a main meal on most days of the week – although the definition of 'cooking a main meal' was not clear. Overall, there

were very few techniques or foods that 90% or more of adults were confident using and there were clear gender differences, favouring women, in confidence across all techniques and foods.⁷³ Other studies have confirmed that women tend to spend more time cooking and report more developed cooking skills than men.^{5 68 74-79} Recent data from low-income UK households found that over 90% of women and children, and over 80% of men, lived in a household where the 'main food provider' (MFP) could prepare a main meal from basic ingredients without help.⁵⁴ Indeed recent data from a range of developed countries suggests that most people eat meals prepared at home on most days.^{3 68 70 73 74 80} UK surveys have found inconsistent trends in cooking skills by age, suggesting that there are not clear cohort effects in self-reported cooking skill, although there may be in how such skills are used.^{14 55 66} An inverted U-shaped relationship between self-reported cooking skill and age was reported in a Swiss sample peaking at age 50-59 years in women and 40-49 years in men.⁵ The reported relationship between markers of socio-economic position and self-reported cooking skills is inconsistent.^{73 74 76 81 82}

We are not aware of any recent, population-representative, data on UK adult cooking skills. The aim of this paper is to provide up-to-date information on the prevalence and socio-demographic correlates of cooking skills in UK adults. As food is often purchased and prepared at a household, rather than individual, level, we also explored cooking skills of the MFP (defined below) in respondents' households.

1.2. Methods

We conducted a cross-sectional analysis of data from wave 1 of the UK National Diet and Nutrition Survey (NDNS) (2008-9).

1.2.1. Data source

The NDNS is an annual cross-sectional survey assessing the diet, nutrient intake and nutritional status of the general population aged 18 months and upwards living in private households in the UK.¹³ Each year, a nationally representative sample is selected using a multi-stage random probability design.

Households across the UK are selected using a multi-stage probability design to take part in the NDNS. In each wave, a random sample of primary sampling units is selected for inclusion. These are small geographical areas that allow more efficient data collection by enabling it to be geographically focused. Within these primary sampling units, private addresses are randomly selected for inclusion. If, on visiting, it is found that more than one household lives at a particular address, one is randomly selected for inclusion. Within participating households, up to one adult and one child are randomly selected to take part as 'respondents'. Data collection includes a researcher interview covering socio-demographics and shopping, cooking and eating habits.⁸³

In each household that includes an NDNS respondent, the person with the main responsibility for shopping and preparing food is identified and labelled the MFP. When these tasks were shared equally between more than one person, either one is identified as the MFP. The MFP can, and often is, also a NDNS respondent. When they are available at the time of data collection, information is collected from MFPs via a structured interview. This interview includes MFP cooking skills and confidence.

The NDNS aims to collect data from a sample of 1,000 respondents per year: 500 adults (aged 19 years and older) and 500 children (aged 1.5 to 18 years). Wave 1 of the NDNS was conducted in February 2008 – March 2009 and included a series of interview questions on cooking skills. Data from

the NDNS were obtained from the UK Data Archive – an online resource that makes research data available to the UK research community.

1.2.2. Inclusion criteria

Respondents were included in the analysis if they: took part in wave 1 of the NDNS; were aged 19 years or older at the time of data collection; and did not report that their ability to cook was limited or prevented due to illness. The MFPs in households of included respondents were included if they also provided an in-person interview. Sixteen MFPs did not provide an in-person interview (during which questions on cooking skills were asked) and were excluded from the analyses.

1.2.3. Variables of interest

Variables of interest fell into two groups: socio-demographic characteristics of respondents and cooking skills of both respondents and MFP.

Socio-demographic variables

Socio-demographic variables of interest were sex, age (collapsed into approximately 15 year age bands for analysis), socio-economic position and MFP status.

Socio-economic position was measured using the National-Statistics Socio-economic Classification (NS-SEC).⁸⁴ This is an occupational classification that we collapsed into three groups (higher and managerial, intermediate, and routine and manual occupations) for analysis, with those not currently in employment classified according to their last main occupation. As per normal procedure, those who had never been employed (n=9) or were unclassifiable (n=10) were included in the routine and manual group (the least affluent group).

Cooking skills

Cooking skills were assessed in three ways - confidence in using eight cooking techniques, confidence in cooking ten foods, and ability to prepare four types of dish. The same questions were used to assess skills in respondents and MFPs.

Confidence in using eight cooking techniques was established using the question: “Which, if any, of the following cooking techniques do you feel confident about using?: boiling; steaming or poaching; frying; stir frying; grilling; oven-baking or roasting; stewing, braising, or casseroles; and microwaving.” Questions reported here were read verbatim to respondents by researchers.

Confidence in cooking ten foods was determined using the question: “Which, if any, of the following foods do you feel confident about cooking?: red meat, chicken, white fish (cod, haddock, plaice), oily fish (herring mackerel, salmon), pulses (such as split peas and lentils), dry pasta, rice (savory), potatoes (not chips), fresh green vegetables (cabbage, spinach, broccoli), and root vegetables (carrots, parsnips).”

For both confidence with cooking techniques and cooking specific foods, techniques and foods were listed on a show-card and respondents and MFPs identified those they felt confident with. Those who spontaneously answered that they were confident with all, or none, were coded as such. It was assumed that if a respondent or MFP did not report feeling confident with a technique or food, then they were not confident with that technique or food.

Ability to prepare four different types of dish was determined using the question “Would you be able to make the following foods and dishes from beginning to end?: convenience foods and ready meals (e.g. frozen pizza, pre-packaged curry & rice); a complete meal from ready-made ingredients (e.g.

ready-made sauces and pasta to make spaghetti Bolognese); a main dish from basic ingredients (raw potatoes, raw meat, onions etc.), possibly following a recipe (e.g. shepherd's pie, curry); and a cake or biscuits from basic ingredients (flour, milk, eggs, etc.), possibly following a recipe.” Response options for each type of dish were: "No, not at all", "Yes, with a lot of help", "Yes, with a little help", and "Yes, with no help at all". As 89% of respondents answered “Yes, with no help at all” to the first three of types of dish, leading to small frequencies in some cells, we dichotomised responses into “Yes, with no help at all” and other responses.

Respondents and MFPs were also asked how frequently they prepared a main meal for themselves, or themselves and others in their household. No further information was provided on what constitutes preparing a main meal. Seven response options were available: never, only for special occasions, less than once a week, one or two days a week, some days (3-4 a week), most days (5-6 a week), and every day. To maintain comparability with previous data,⁷³ we dichotomised answers into most days (5 days of the week or more) and less often.

For the remainder of this chapter we use the term ‘cooking skills’ as short-hand to refer to the outcomes described in this section. As described above, ‘cooking skills’ are likely to be more complex than is captured by just these questions.

1.2.4. Statistical analysis

Study weights, provided with NDNS data, were used throughout and all analyses were conducted on weighted data. These weights remove any bias imposed by the method of selecting households and individuals to take part; and reduce any non-response bias at the individual (but not question) level.¹³ The use of study weights means that all frequencies are presented as percentages (with 95% confidence intervals) rather than raw frequencies.

There was no missing data for individual respondents. As mentioned above, 16 MFPs did not provide in-person interviews and were excluded from the analyses.

Simple descriptive analyses based on calculating frequencies and proportions were conducted to ascertain the frequency of each measure of cooking frequency and skill - overall and across levels of socio-demographic variables. Chi-squared tests were carried out to establish if any differences in frequencies across socio-demographic variables were statistically significant. Given the large number of statistical tests performed, a p-value of <0.01 was taken to indicate statistical significance.

All analyses were conducted in Stata v11.

1.2.5. Ethics

Ethical approval for wave 1 of the NDNS was obtained from Oxfordshire A Research Ethics Committee. We did not require additional ethical approval for this secondary analysis of anonymised data.

1.3. Results

In total, 509 respondents, and 493 MFPs, from 509 households were included in the analysis. Table 2 shows the distribution of socio-demographic variables of interest. There was an even split of respondents by gender (49.0%, 95% confidence intervals: 44.2 – 53.9 male); median age was 46 years (inter-quartile range: 33-62 years); just over one third of respondents (36.1%, 95%CI: 31.4 – 40.9) were in the routine & manual socio-economic group and just less than one-quarter (20.1%, 95%CI: 16.5 – 24.3) were in the intermediate socio-economic group; and over two-thirds (67.5%, 95%CI: 62.5 – 72.1) were classified as the MFP in their household.

Table 2 also shows the proportion of respondents who reported preparing a main meal at least five times per week, and the proportion who lived in a household where the MFP did this. Almost two thirds of respondents (63.1%, 95%CI: 58.1 – 67.8) said they prepared a main meal on most days of the week, whilst more than four fifths (83.9%, 95%CI: 80.0 – 87.2) lived in a household where the MFP said they did so. Women and respondents who were MFPs were more likely to report cooking a main meal on most days.

The percentages of respondents reporting confidence in using the eight cooking techniques are shown in Table 3. Three-quarters, or more, of respondents reported confidence with using each of the techniques, except stir-frying (where just less than three-quarters - 74.4%, 95%CI: 70.0 – 78.4 - reported confidence). At least 90% of respondents reported confidence with boiling (93.1%, 95%CI: 90.0 – 95.2), grilling (90.6%, 95%CI: 87.3 – 93.1), and oven-baking or roasting (90.0%, 95%CI: 86.4 – 92.7).

There were some, scattered, differences in confidence with techniques by socio-demographic variables. Generally, women and respondents who were MFPs tended to be most likely, and those in the youngest age group (19-34 years) and the lowest socio-economic group least likely, to report confidence with cooking techniques.

Table 4 shows confidence with cooking 10 different foods. More than three-quarters of respondents reported confidence cooking each food, except oily fish (69.9%, 95%CI: 65.3 – 74.1) and pulses (60.4%, 95%CI: 55.5 – 65.1). More than 90% of respondents reported confidence with cooking chicken (91.3%, 95%CI: 88.1 – 93.8), potatoes (94.3%, 95%CI: 91.2 – 95.1), and fresh green vegetables (92.7%, 95%CI: 89.4 – 95.1). Again, scattered differences in reported confidence across socio-demographic characteristics were seen. As before, women and those who were the MFP tended to be most likely to report confidence; and those in the lowest socio-economic group least likely to report confidence with cooking specific foods. Trends by age were more mixed with those in the youngest age group (19-34 years) being least likely to report confidence with cooking oily fish and pulses, but those in the oldest age group (>64 years) being least likely to report confidence cooking dry pasta and rice.

The reported ability of respondents to prepare four types of dishes without help is shown in **Table 5**. More than 90% of respondents reported being able to prepare ready meals (97.6%, 95%CI: 95.3 – 98.7) and a meal from ready-made ingredients (93.1%, 95%CI: 90.1 – 95.3) without help, with 89.2% (95%CI: 85.5 – 92.1) reporting being able to do the same for a main dish from basic ingredients. Just over two thirds of respondents (69.0%, 95%CI: 64.2 – 73.4) said they could bake a cake or biscuits without help. There were few statistically significant differences in ability to prepare these dishes by socio-demographic groups. Where these were found, women and those who were MFPs were most likely to be able to prepare dishes without help.

Data in supplemental tables A, B and C (in the Appendix) show that more than 75% of respondents lived in households where the MFP reported confidence with each cooking technique and food, except oily fish (72.7%, 95%CI: 68.2 – 76.7) and pulses (63.0%; 58.1 – 67.6). The MFP in more than 90% of respondent households reported being able to prepare convenience foods (94.7%, 95%CI: 91.8 – 96.5), a complete meal from ready-made ingredients (93.3%, 95%CI: 90.4 – 95.4), and a main dish from basic ingredients (93.2%, 95%CI: 90.2 – 95.4) without help. Very few differences in MFP confidence and ability were seen by respondent socio-demographic characteristics. Where these

were seen, those in the youngest age group (19-34 years) and lowest socio-economic group were least likely to live in a household where the MFP reported confidence.

Table 2: frequency of main meal preparation, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Distribution, % (95% confidence intervals)	Respondent prepares main meal for self ± others 5+ days per week, % (95% confidence intervals)	Main food provider prepares main meal for self ± others 5+ days per week, % (95% confidence intervals)
All	100	63.1 (58.1 - 67.8)	83.9 (80.0 - 87.2)
Gender			
Men	49.0 (44.2 - 53.9)	43.5 (36.5 - 50.8)	84.5 (79.0 - 88.8)
Women	51.0 (46.1 - 55.8)	81.9 (76.0 - 86.6)	83.4 (77.4 - 88.0)
$\chi^2_{df=508}(p\text{-value})$	--	61.61 (p<0.001)	0.10 (0.753)
Age (years)			
19-34	28.0 (23.6 - 32.8)	53.3 (43.1 - 63.2)	76.9 (67.1 - 84.5)
35-49	27.6 (23.5 - 32.0)	67.8 (59.0 - 75.4)	85.6 (79.1 - 90.3)
50-64	24.4 (20.5 - 28.6)	66.3 (56.4 - 75.0)	87.8 (81.0 - 92.3)
>64	20.1 (16.5 - 24.3)	66.3 (55.5 - 75.6)	86.7 (77.2 - 92.7)
$\chi^2_{df=508}(p\text{-value})$	--	2.14 (0.094)	2.11 (0.100)
NS-SEC			
Routine & manual	36.1 (31.4 - 40.9)	60.5 (52.2 - 68.2)	81.7 (75.0 - 86.9)
Intermediate	22.2 (18.3 - 26.8)	72.7 (61.3 - 81.7)	88.4 (79.7 - 93.7)
Managerial & prof.	41.7 (37.0 - 46.7)	60.2 (52.3 - 67.5)	84.0 (77.2 - 89.1)
$\chi^2_{df=508}(p\text{-value})$	--	2.02 (0.134)	1.03 (0.356)
Respondent is main food provider			
No	32.6 (27.9 - 37.5)	16.9 (11.0 - 25.1)	--
Yes	67.5 (62.5 - 72.1)	85.3 (80.8 - 88.9)	--
$\chi^2_{df=508}(p\text{-value})$	--	163.86 (<0.001)	--

NS-SEC: National Statistics socio-economic classification; --: not applicable; **bold text** indicates p<0.01

Table 3: confidence in using eight cooking techniques, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Boiling, % (95% CI)	Steaming, poaching, % (95% CI)	Frying, % (95% CI)	Stir frying, % (95% CI)	Grilling, % (95% CI)	Oven-baking, roasting, % (95% CI)	Stewing, braising, casseroling, % (95% CI)	Microwaving, % (95% CI)
All respondents	93.1 (90.0 - 95.2)	75.0 (70.4 - 79.0)	88.2 (84.8 - 90.9)	74.4 (70.0 - 78.4)	90.6 (87.3 - 93.1)	90.0 (86.4 - 92.7)	76.0 (71.4 - 80.1)	83.1 (79.3 - 86.4)
Gender								
Men	89.7 (84.2 - 93.4)	67.3 (60.0 - 73.9)	90.0 (84.2 - 93.2)	69.7 (62.6 - 75.9)	87.7 (82.1 - 91.8)	81.9 (75.3 - 87.0)	81.9 (75.8 - 86.8)	81.9 (75.8 - 86.8)
Women	96.3 (92.6 - 98.2)	82.3 (76.9 - 86.7)	86.8 (82.1 - 90.4)	79.0 (73.4 - 83.7)	93.4 (89.4 - 96.0)	97.7 (95.1 - 98.9)	84.2 (79.2 - 88.2)	84.2 (79.2 - 88.2)
$\chi^2_{df=508}(p\text{-value})$	6.54 (0.011)	12.37 (<0.001)	0.77 (0.381)	4.81 (0.029)	3.94 (0.048)	35.42 (<0.001)	15.62 (<0.001)	0.40 (0.526)
Age (years)								
19-34	92.2 (85.7 - 95.9)	59.6 (49.3 - 69.0)	89.0 (82.1 - 93.4)	72.5 (63.1 - 80.3)	87.1 (79.1 - 92.3)	88.8 (80.5 - 93.8)	59.8 (49.6 - 69.3)	89.4 (82.0 - 94.0)
35-49	94.5 (91.1 - 97.5)	86.5 (79.0 - 91.6)	88.3 (81.5 - 92.8)	83.3 (75.5 - 88.9)	94.8 (88.9 - 97.6)	96.7 (92.1 - 98.7)	82.0 (73.9 - 88.0)	81.3 (73.8 - 87.0)
50-64	93.0 (84.2 - 97.0)	78.2 (69.2 - 85.2)	86.6 (78.5 - 91.9)	74.5 (65.2 - 82.0)	92.5 (84.8 - 96.5)	88.7 (79.8 - 94.0)	84.1 (75.5 - 90.1)	82.2 (73.7 - 88.5)
>64	92.4 (84.1 - 96.5)	76.6 (66.7 - 84.3)	88.7 (80.1 - 93.9)	64.8 (54.1 - 74.2)	87.6 (78.9 - 93.0)	83.8 (74.0 - 90.4)	80.6 (70.7 - 87.7)	77.8 (68.0 - 85.3)
$\chi^2_{df=508}(p\text{-value})$	0.16 (0.924)	7.65 (<0.001)	0.12 (0.947)	2.98 (0.030)	1.70 (0.166)	3.00 (0.031)	7.44 (<0.001)	1.81 (0.144)
NS-SEC								
Routine & manual	91.1 (85.0 - 94.9)	64.9 (57.1 - 72.0)	84.0 (77.4 - 88.9)	63.1 (55.3 - 70.3)	85.1 (78.2 - 90.0)	85.0 (78.1 - 90.0)	67.9 (59.9 - 74.9)	78.3 (71.1 - 84.2)
Intermediate	96.0 (88.3 - 98.7)	86.1 (76.2 - 92.3)	91.5 (84.1 - 95.6)	82.1 (72.9 - 88.7)	94.6 (87.7 - 97.7)	94.9 (86.8 - 98.1)	89.9 (80.5 - 95.1)	84.6 (76.1 - 90.4)
Managerial & prof.	93.3 (88.3 - 96.3)	78.6 (71.4 - 84.3)	90.4 (85.3 - 93.8)	81.0 (74.4 - 86.3)	93.8 (89.2 - 96.6)	92.0 (86.3 - 95.5)	76.4 (69.0 - 82.4)	86.9 (81.3 - 90.9)
$\chi^2_{df=508}(p\text{-value})$	0.95 (0.386)	6.95 (0.001)	2.40 (0.091)	8.74 (<0.001)	4.86 (0.008)	3.18 (0.042)	6.63 (0.001)	2.39 (0.093)
Respondent is main food provider								
No	85.7 (77.9 - 91.1)	63.2 (53.7 - 71.9)	89.7 (82.4 - 94.1)	69.8 (70.6 - 77.6)	88.2 (80.3 - 93.2)	79.2 (70.4 - 85.9)	58.7 (49.1 - 67.6)	87.5 (79.9 - 92.5)
Yes	96.6 (93.7 - 98.2)	80.6 (75.8 - 84.6)	87.4 (83.4 - 90.6)	76.7 (71.6 - 81.1)	91.8 (88.3 - 94.3)	95.1 (92.1 - 97.0)	84.4 (79.9 - 88.1)	81.0 (76.3 - 84.9)
$\chi^2_{df=508}(p\text{-value})$	15.71 (<0.001)	13.14 (<0.001)	0.39 (0.533)	2.08 (0.150)	1.21 (0.273)	24.32 (<0.001)	30.14 (<0.001)	2.42 (0.120)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates p<0.01

Table 4: confidence in cooking 10 foods, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Red meat, % (95% CI)	Chicken, % (95% CI)	White fish, % (95% CI)	Oily fish, % (95% CI)	Pulses, % (95% CI)	Dry pasta, % (95% CI)	Rice (savoury), % (95% CI)	Potatoes (not chips) , % (95% CI)	Fresh green veg, % (95% CI)	Root veg, % (95% CI)
All	87.7 (84.2 - 90.5)	91.3 (88.1 - 93.8)	79.7 (75.4 - 83.5)	69.9 (65.2 - 74.1)	60.4 (55.5 - 65.1)	84.9 (80.9 - 88.1)	87.8 (84.1 - 90.7)	94.3 (91.2 - 96.4)	92.7 (89.4 - 95.1)	89.6 (86.1 - 92.3)
Gender										
Men	87.8 (82.3 - 91.7)	88.4 (82.7 - 92.3)	74.9 (67.8 - 80.9)	63.8 (56.5 - 70.5)	55.1 (47.7 - 62.2)	78.8 (72.3 - 84.2)	83.2 (76.9 - 88.1)	92.4 (87.0 - 95.7)	87.9 (81.9 - 92.1)	85.5 (79.5 - 90.0)
Women	87.6 (82.6 - 91.3)	94.2 (90.3 - 96.6)	84.3 (79.1 - 88.4)	75.7 (70.0 - 80.7)	65.4 (58.9 - 71.4)	90.7 (86.0 - 93.9)	92.1 (87.9 - 95.0)	96.2 (92.1 - 98.2)	97.3 (93.7 - 98.9)	93.5 (89.2 - 96.1)
$\chi^2_{df=508}(\text{p-value})$	0.002 (0.964)	4.37 (0.037)	5.54 (0.019)	7.12 (0.008)	4.46 (0.035)	11.06 (<0.001)	7.66 (0.006)	2.20 (0.139)	11.50 (<0.001)	6.64 (0.010)
Age (years)										
19-34	82.0 (73.8 - 88.0)	88.9 (82.0 - 93.4)	70.5 (60.7 - 78.7)	56.5 (46.4 - 65.6)	46.4 (36.6 - 56.4)	92.3 (85.7 - 96.0)	91.7 (84.8 - 95.6)	93.4 (85.8 - 97.1)	90.4 (82.5 - 95.0)	85.7 (77.7 - 91.2)
35-49	91.0 (84.1 - 95.1)	93.6 (87.2 - 96.9)	78.7 (70.3 - 85.3)	78.0 (69.9 - 84.4)	67.1 (58.4 - 74.8)	92.0 (84.6 - 96.0)	93.4 (86.0 - 97.0)	94.9 (87.6 - 98.0)	93.1 (85.7 - 96.8)	92.7 (86.0 - 96.3)
50-64	91.1 (83.1 - 95.5)	92.1 (83.3 - 96.4)	86.2 (77.5 - 91.9)	74.4 (65.2 - 81.9)	65.2 (55.6 - 73.7)	81.9 (72.6 - 88.5)	84.9 (75.7 - 91.0)	94.6 (86.4 - 98.0)	93.1 (84.4 - 97.1)	90.3 (81.6 - 95.1)
>64	87.0 (78.4 - 92.5)	90.6 (82.1 - 95.3)	86.0 (76.8 - 92.0)	71.9 (61.3 - 80.5)	64.7 (53.9 - 74.1)	68.3 (57.7 - 77.4)	78.2 (68.2 - 85.7)	94.6 (87.3 - 97.8)	94.9 (87.9 - 98.0)	90.0 (80.9 - 95.0)
$\chi^2_{df=508}(\text{p-value})$	1.90 (0.129)	0.53 (0.662)	3.40 (0.017)	4.81 (0.003)	4.35 (0.005)	8.58 (<0.001)	3.83 (0.010)	0.08 (0.971)	0.44 (0.723)	0.93 (0.427)
NS-SEC										
Routine	84.0 (77.4 - 88.9)	88.2 (82.0 - 92.5)	73.7 (66.0 - 80.2)	57.6 (49.8 - 65.1)	46.0 (38.5 - 53.7)	79.0 (71.8 - 84.8)	81.3 (74.2 - 86.8)	91.8 (85.6 - 95.5)	88.7 (81.8 - 93.2)	84.1 (77.2 - 89.2)
Intermediate	93.9 (87.3 - 97.1)	96.0 (88.6 - 98.7)	85.4 (75.5 - 91.7)	79.6 (69.4 - 87.0)	69.3 (58.2 - 78.5)	85.2 (75.6 - 91.5)	93.2 (86.5 - 96.7)	97.5 (84.5 - 99.6)	99.6 (96.9 - 99.9)	97.6 (90.9 - 99.4)
Managerial	88.0 (81.9 - 92.2)	91.8 (86.3 - 95.2)	82.4 (75.8 - 87.5)	76.4 (69.4 - 82.2)	69.2 (61.7 - 75.9)	90.2 (84.5 - 94.0)	91.0 (84.9 - 94.8)	95.1 (90.3 - 97.5)	92.9 (87.4 - 96.1)	90.5 (84.7 - 94.3)
$\chi^2_{df=508}(\text{p-value})$	2.73 (0.066)	2.04 (0.130)	2.74 (0.065)	9.00 (<0.001)	10.43 (<0.001)	3.67 (0.026)	5.01 (0.007)	1.16 (0.310)	6.19 (0.004)	5.25 (0.005)
Respondent is main food provider										
No	81.7 (73.5 - 87.8)	84.3 (76.2 - 90.0)	67.4 (58.0 - 75.6)	56.2 (46.8 - 65.3)	49.5 (40.2 - 58.8)	81.6 (73.3 - 87.7)	84.2 (76.0 - 89.9)	90.0 (82.6 - 94.4)	83.9 (75.6 - 89.7)	81.1 (72.7 - 87.3)
Yes	90.6 (86.9 - 93.3)	94.7 (91.7 - 96.7)	85.7 (81.3 - 89.2)	76.4 (71.5 - 80.7)	65.6 (59.9 - 70.8)	86.5 (81.9 - 90.0)	89.5 (85.4 - 92.6)	96.5 (92.9 - 98.3)	97.0 (93.7 - 98.6)	93.7 (90.2 - 96.0)
$\chi^2_{df=508}(\text{p-value})$	6.43 (0.012)	12.39 (<0.001)	17.09 (<0.001)	16.21 (<0.001)	8.61 (0.004)	1.53 (0.217)	2.15 (0.143)	5.58 (0.019)	18.51 (<0.001)	14.28 (<0.001)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates p<0.01

Table 5: ability to prepare four dish types without help, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Convenience foods & ready meals, % (95% CI)	Complete meal from ready-made ingredients, % (95% CI)	Main dish from basic ingredients, % (95% CI)	Cake or biscuits from basic ingredients, % (95% CI)
All respondents	97.6 (95.3 - 98.7)	93.1 (90.1 - 95.3)	89.2 (85.5 - 92.1)	69.0 (64.2 - 73.4)
Gender				
Men	95.7 (91.3 - 97.9)	89.2 (83.6 - 93.0)	82.8 (76.1 - 87.9)	47.6 (40.0 - 54.9)
Women	99.4 (97.1 - 99.9)	97.0 (94.0 - 98.5)	95.5 (92.1 - 97.4)	89.5 (85.1 - 92.7)
$\chi^2_{df=508}(\text{p-value})$	6.77 (0.010)	11.05 (0.001)	18.52 (<0.001)	95.09 (<0.001)
Age (years)				
19-34	98.9 (95.6 - 99.7)	95.6 (89.8 - 98.2)	86.0 (77.5 - 91.6)	64.8 (54.7 - 73.8)
35-49	99.2 (94.5 - 99.9)	97.4 (93.0 - 99.1)	91.6 (84.1 - 95.8)	79.1 (70.9 - 85.4)
50-64	94.5 (85.9 - 98.0)	90.4 (81.6 - 95.3)	89.9 (81.0 - 95.0)	67.8 (57.8 - 76.4)
>64	97.2 (91.1 - 99.2)	87.1 (78.1 - 92.8)	89.5 (80.8 - 94.6)	62.4 (51.5 - 72.1)
$\chi^2_{df=508}(\text{p-value})$	2.26 (0.082)	3.36 (0.019)	0.57 (0.636)	2.69 (0.045)
NS-SEC				
Routine & manual	96.9 (91.2 - 98.9)	91.4 (85.8 - 94.9)	86.4 (79.6 - 91.1)	65.5 (57.7 - 72.5)
Intermediate	98.1 (92.6 - 99.5)	94.2 (85.1 - 97.8)	88.5 (77.9 - 94.4)	66.9 (55.4 - 76.7)
Managerial & prof.	97.9 (94.5 - 99.2)	94.2 (89.4 - 96.9)	92.3 (87.0 - 95.6)	73.5 (66.1 - 79.7)
$\chi^2_{df=508}(\text{p-value})$	0.27 (0.761)	0.52 (0.590)	1.27 (0.282)	1.20 (0.272)
Respondent is main food provider				
No	94.7 (88.0 - 97.8)	85.3 (77.3 - 90.8)	74.0 (64.8 - 81.5)	48.7 (39.4 - 58.0)
Yes	98.9 (97.3 - 99.6)	96.9 (94.6 - 98.3)	96.6 (93.4 - 98.1)	78.6 (73.6 - 82.9)
$\chi^2_{df=508}(\text{p-value})$	7.51 (0.006)	21.18 (<0.001)	48.56 (<0.001)	34.02 (<0.001)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates $p < 0.01$

1.4. Discussion

1.4.1. Summary of results

As far as we are aware, this is the only exploration of the prevalence and socio-demographic correlates of adult cooking skills using recent and population-representative UK data. Our results also contribute to the limited international evidence on this topic. With a few notable exceptions, we found high prevalence of self-reported confidence with using a range of cooking techniques and cooking a range of foods and dishes in both respondents and household MFPs. Almost two-thirds of respondents said they cooked a main meal at least five times per week and more than four-fifths lived in a household where the MFP did so. Almost 90% of respondents reported being able to cook a main dish from basic ingredients without help, and more than 90% of respondents lived in a household where the MFP could do so.

Differences in reported cooking confidence across socio-demographic variables were scattered and inconsistent. Where these were found, in general women and respondents who were also MFPs were most likely, and those in the youngest age group (19-34 years) and lowest socio-economic group were least likely, to report confidence. However, older adults were least confident particularly with cooking dry pasta and savoury rice. These differences indicate a number of social inequalities in cooking skills according to gender, socio-economic position and age.

1.4.2. Strengths and limitations of methods

The NDNS aims to recruit a population-representative sample at each wave. We used the study weights provided to reduce biases related to the sampling method and non-response at the respondent level, where this exists. Thus, we are confident that this is the most population-representative data on cooking skills currently available in the UK. Previous quantitative studies have either been restricted to those living in low-income households,⁵⁴ small convenience samples,⁵⁵ or were conducted more than 15 years ago.¹⁶

It is possible that self-reported data on cooking skills is subject to social desirability bias.¹⁶ However, it is not clear that this would be stable across socio-demographic groups. For instance, whilst women may feel pressure to report more confidence than they feel with cooking,⁵¹ men may not. Thus, our results may over-state gender differences in cooking skills. Although there is evidence of gender differences in the social desirability bias in dietary self-report,⁸⁵ we are not aware of any studies of social desirability bias in cooking skills specifically. The directions of effect of any other socio-demographic differences in social desirability bias are harder to predict.

The validity and reliability of the questions used to assess cooking skills have not been explored. Differences in individual interpretations of the meaning of 'confidence' with cooking techniques and foods are likely to introduce error. Systematic differences in interpretations across socio-economic groups may also exist, leading to bias. Again, it is difficult to predict the directions of any effects.

The complexity of the phenomenon of 'cooking' has been noted.^{14 15} It is unlikely that the simple questions used here adequately capture this complex construct. A short questionnaire, with good test-retest reliability and internal consistency has been recently developed.⁵ Whilst this shares some similarities with some of the questions used here, it too is simplistic and unlikely to capture the full complexity of cooking skills. Another questionnaire has been developed to assess the impact of cooking skills interventions.⁸⁶ However, this focuses on the wider potential outcomes of cooking skills interventions, rather than just the skills themselves - covering issues such as confidence in using a

recipe; and frequency of purchasing convenience food and experimenting with new foods. A simple, but comprehensive, measure of cooking skills is required for population monitoring.

Data from wave 1 of the NDNS are now around five years old. It is possible, although unlikely, that prevalence of cooking skills has changed substantially over these years. Although more recent waves of the NDNS have been conducted, they did not include questions on cooking skills. Ongoing monitoring of population cooking skills would be valuable.

At just over 500 adults, wave 1 of the NDNS is relatively small. The NDNS is currently conceived as a 'rolling programme' with each new wave being combined with previous waves to increase sample size. As indicated above, we were not able to take advantage of more recent waves of data. Nor did we include the approximately 50% of wave 1 respondents who were children. Although children are asked some questions about cooking, these do not cover skills and confidence as in adults. This means data from children could not be combined with that from adults to increase the sample size.

As only 10% of the NDNS were non-white, we were not able to reliably study ethnic variations in cooking skills. Nor did we study where respondents and MFPs obtained their cooking skills from.

We had originally intended to model the relationships between markers of cooking skill and markers of dietary quality and body composition, using multivariate methods, which would have answered the research questions:

5. *Is there a relationship between poor cooking skills in UK adults and either diet quality or body weight, after taking into account of socio-economic variables such as age, gender and socio-economic position?*
6. *Does any relationship between poor cooking skills and diet quality or body weight vary according to socio-demographic variables such as age, gender and socio-economic position?*

However, as cooking skills were so highly prevalent, and little variability was present, these measures were not effective at differentiating respondents within the population, meaning that it was not possible to further explore relationships between poor cooking skills, diet quality and body weight. Future work should explore these relationships further.

1.4.3. Interpretation and implications of results

Our results suggest very high prevalence of reporting confidence with cooking. Compared to similar data collected in the UK in 1997, reported confidence in cooking all ten food items has increased in both men and women.⁷³ For example, whilst more than 75% of respondents were confident with all techniques except stir-frying in the current work, confidence was only this high for boiling, grilling, frying and oven-baking in 1997. Furthermore, gender differences seen in cooking confidence for all ten foods in 1997 were much less evident in the current work.⁷³ Possible explanations for these improvements include the proliferation of local cooking skills initiatives across the UK,¹¹ increased media coverage of food and cooking topics, and changes in individuals' perceptions of their own skills.

Our results suggest that most UK adults do not perceive themselves to be lacking cooking skills - or, at least, are not willing to acknowledge this to a researcher. This suggests that most UK adults are unlikely to think (or, perhaps, admit) they would benefit from a basic cooking skills course and so

volunteer for such an intervention. Indeed, previous studies have struggled to recruit to evaluations of cooking skills interventions.¹⁷ This is not to say that few individuals would benefit, but any intervention would have to be well-targeted and carefully consider how best to reach and recruit those most likely to benefit.

Despite high prevalence of reported cooking skills, we found that these skills are not necessarily being frequently used. For example, whilst almost 90% of respondents reported being able to prepare a meal from basic ingredients without help, only two-thirds did so five times a week or more. This confirms that possessing cooking skills is not the same as making frequent use of these skills.^{16 17} One reason why people may not make regular use of their cooking skills is that other members of their household are responsible for cooking. This is reflected in the high frequency of meal preparation amongst MFPs - with over 80% preparing main meals on five or more days per week.

It seems logical that having cooking skills is a pre-requisite for being able to prepare nutritious meals, and associations between cooking skills and dietary quality have been reported.^{3 5 69 70} As described above, the high prevalence of reported cooking skills meant we were unable to study any relationships between cooking skills and either dietary quality or adiposity. However, it should not be assumed that possessing cooking skills means that food cooked, or eaten, will necessarily be nutritious. Fresh green vegetables were one of the foods that respondents were most confident with preparing (92.7% reporting confidence), yet less than 40% of respondents in wave 1 of NDNS consumed five or more 80g portions of fruit and vegetables per day.¹³ Providing individuals with the skills to cook nutritious meals may be necessary, but not sufficient, to ensure that they do so regularly.^{87 88} In order to have a substantial positive impact on the population's dietary intake, interventions should also take account of the many social and environmental determinants of diet.¹⁴

89

Whilst we found few socio-demographic differences in self-reported cooking skills, those that were present tended to indicate that women and respondents who were MFPs were most likely to be confident with cooking, whilst those age 19-34 years and those in the lowest socio-economic group were least likely to be confident. These findings suggest that any attempt to recruit adults to cooking skills interventions may find it useful to focus on recruiting men, those younger than 35 years, and those in the least affluent socio-economic groups.

Many others have confirmed that women continue to spend more time cooking than men,^{68 74-79} so the finding that they report more developed cooking skills is not surprising. It makes sense that the individual in the household with most skill and confidence should become the MFP, and also that confidence and skill would develop in those who spend most time preparing food. Thus, the relationship between MFP status and cooking skill is also not surprising.

Age-related differences in cooking skill may reflect differences in frequency of cooking - with the youngest adults being least likely to have, or have had, children at home and so be preparing food frequently and therefore developing their skills. The results give some credence to the popular belief that younger generations have 'forgotten' how to cook due to increased exposure to convenience foods.⁹⁰ However, it is also possible that young adults only develop cooking skills when they perceive these to be required - for example, when they become responsible for their own children. Previous work with small sample sizes has found that older and younger UK women report similar levels of cooking skills - although use these differently.^{14 55} Further work is required to explore how and when

individuals develop cooking skills and if there are any particular ‘windows of opportunity’ for intervention.

There was a consistent finding that those in the lowest socio-economic group had the lowest cooking confidence. Qualitative research has described a number of barriers to developing cooking skills through experimentation in more deprived groups, including: lack of time, fear of waste, difficulties with following written recipes (perhaps compounded by limited literacy and numeracy), and uncertainties over food safety and labelling.^{14 91} The proportion of adults living in a household where the MFP could cook a meal from basic ingredients (93% overall) was higher in the current general population sample than in a UK low-income sample (90% of women and 80% of men).⁵⁴ This suggests socio-economic inequalities in household cooking skills exist in the UK.

1.5. Conclusion

In this population-representative sample of UK adults, self-reported confidence with using most cooking techniques and preparing most foods was high in respondents and those in their households responsible for food preparation. The great majority of respondents said they were able to prepare a main meal from basic ingredients without help. There were few socio-demographic differences in reported cooking skills, but where these did occur women and those who had primary household responsibility for food tended to be most likely, and those in the lowest age (19-34 years) and socio-economic group least likely, to report confidence. Adult cooking skills interventions should be clearly targeted at those most at risk of reporting low levels of cooking confidence and poorer cooking skills. Careful consideration of how best to reach and recruit those most likely to benefit is required.

2. Work Package 2 – analysis of course manual & intervention observations

2.1. Background

This work package aimed to answer research questions 5-7, which are:

1. *What is the theoretical basis, in terms of behaviour change, of the JOMoF cooking skills intervention?*
2. *What is the fidelity of the JOMoF cooking skills intervention?*
3. *Are there temporal or locational variations in intervention fidelity?*

2.1.1. Behaviour change techniques

In the absence of any explicit theoretical basis for the course, our approach was to seek theoretical constructs within the course materials and delivery of the course. To achieve this we sought specific behaviour change techniques, which we anticipated could then point us to a potential underlying theory that might, in future, be used to support course development. Behaviour change techniques (BCTs) are practical methods that can enhance the effectiveness of behaviour change interventions.¹⁸
¹⁹ BCTs are typically things that can be done or said by intervention deliverers to, or with, intervention recipients. For example, these may include the setting of specific behavioural goals, making action plans, or provision of feedback or rewards dependent on successfully performing a behaviour. A BCT should be observable and replicable, and designed to have an impact on the causal processes that lead to a particular behaviour; they are sometimes referred to as the ‘active ingredients’ of interventions, as it is thought that these specific techniques are what may cause a particular intervention to be successful.^{18 21 92} To help with intervention development and classification, and to increase standardisation of descriptions of interventions, taxonomies of BCTs have been developed by reviewing descriptions of effective health-related interventions to identify what active ingredients appear to be consistently effective.¹⁹⁻²¹

To establish whether the JOMoF intervention was using any BCTs, we used the 40-item, CALO-RE BCT taxonomy, which was specifically developed from descriptions of interventions targeting physical activity and healthy eating behaviours. The taxonomy provides definitions for 40 BCTs.¹⁸ A full list of 40 BCTs in the taxonomy, together with definitions is shown in Table D the Appendix.

The JOMoF cooking skills course has a formal manual, the purpose of which is to guide its setup and implementation, by providing an outline for the course and session structure, and acting as a reference tool for the centres. The manual is broken down by class topic, with information provided about nutrition, ethos, key cooking skills, shopping advice and food safety. The information is laid out by section, and is presented as short paragraphs or bullet points rather than being a structured breakdown of exactly what should be done or said in each parts of each class; recipes are selected from an approved list supplied by JOMoF.

2.1.2. Fidelity

The stated aims of the course

The principle aim of the JOMoF intervention is teach people how to cook, for the purpose of improving people’s diets and diet-related health outcomes. It also acknowledges the potential peripheral effects of learning to cook, such as improved self-esteem and social connectedness.

Specifically, the course aspires to have each participant leave the course with the ability to:

- “Cook from scratch

- Prepare healthy, balanced meals – no matter what their budget
- Follow a recipe
- Know what an appropriate portion size and balanced plate looks like
- Balance their meals and understand simple nutrition
- Get excited and curious about food, where it comes from and how it's grown
- Understand the benefits (on their health and finances) of buying local, seasonal ingredients
- Try new foods and flavours, and discover new favourites
- Get into the habit of eating well, for good
- Pass the knowledge and skills they've gained onto their children, friends and family."

Based on these statements, we determined that the principle aim of the course is to teach people to cook in order to improve their diets, but that the course also aims to impact upon other behaviours related to food and eating.

Understanding fidelity

Understanding the fidelity of an intervention is critical to understanding the reasons for its success, or failure, in achieving its desired aims, and differential outcomes by population group or intervention location.²² The term 'fidelity' may be used to describe one or more dimensions, including whether an intervention is delivered as planned, the reasons why an intervention fails or succeeds, and whether an intervention changes or adapts as it progresses. All of these can be influenced by quality of preparation and planning, delivery and engagement.^{23 24} The fidelity of an intervention is thus likely to impact upon its feasibility, which is important to establish in the context of this work.

We therefore proposed to assess whether the intervention was implemented as intended (according to the intervention manual), whether there were variations in delivery style and content, whether participants were engaged during intervention delivery, and whether any of these elements varied between JOMoF sites, instructor, or point in the curriculum. The results of the analysis of these elements will establish whether a definitive RCT is both justified and practical, based on the existing intervention model, and contribute to the development of a protocol for a definitive trial.

To compare and contrast classes, both against the manual and against each other, we conducted in-person observations of classes. To guide these observations, a bespoke observation form was developed, based on the review of the course manual and iterative piloting and revision.

2.2. Methods

2.2.1. Manual analysis

The purpose of analysing the manual was twofold: firstly, to establish the theoretical basis of the intervention, in terms of behaviour change; and secondly, to extract information about the content and structure of the course in order to develop an observation form with which to measure fidelity. The target behaviours that we were interested in were those related to both cooking skill and healthy eating.

The BCTs of the cooking skills intervention were identified by undertaking a coding exercise with the course manual. We established whether the course has any explicit or implicit theoretical basis in terms of which, if any, BCTs are used. The coding was conducted independently by two researchers (RP and JH), trained in the application of the taxonomy to code intervention techniques by an experienced coder (NO). Each of the eight sessions were coded separately for the presence or absence of each BCT. Each researcher also stated their level of confidence about each judgement. Disagreements or discrepancies in coding between the two researchers were discussed in consultation with a third, experienced coder (NO). A matrix displaying which BCTs were expected to occur in each of the eight sessions was developed to serve as an observation form. Other relevant information, relating to nutritional messages and teaching style, was also extracted from the manual, and recorded on the observation form. During the observations, any messages relating to nutrition were noted verbatim. It should be noted that the manual, at the time of coding, contained session outlines for 10 sessions, as the course originally followed a 10-session format. However, shortly after commencement of the course, following feedback from the JOMoF centres and participants, one of the sessions (roast dinner) was removed from the course and two others sessions were combined into one (eggs and breakfast). Therefore, for the purposes of these analyses the roast dinner class was omitted and the coding for the eggs and breakfast classes were pooled into one session, yielding 8 sessions in total.

In addition to this, we also extracted information relating to the structure and content of the course, in terms of nutritional messages, ethos, and practical skills such as chopping, cooking and shopping or budgeting. The information that was extracted, in combination with the interventions, would help us to determine whether the intervention, in practice, aligned with its description in order to establish its fidelity.

2.2.2. Observation form development

The observation form captured the structure, learning style, teaching style, messages and use of BCTs during the cooking skills course. Direct, in-person observations allowed us to ascertain which BCTs and messages - identified from the course manual - were actually used, and whether the course structure was as described. The observations also allowed us to establish whether additional BCTs were used that were not identified in the course manual.

The development of the observation form was an iterative process, consisting of three rounds of drafting, piloting and revisions. The initial draft of the observation form comprised mainly forced choice, tick box style responses, which used the framework of BCTs and course structure that had been identified from the course manual. On piloting of this first draft, it became clear that each site had adapted the outline of the course to suit their individual circumstances and organisational aims. Thus, the subsequent iteration remained semi-structured with fewer closed, tick-box elements, and adopted an approach to capture data that allowed for the capture of multiple segments of facilitator input and participant practice. This format allowed us to capture the heterogeneity in sessions in terms of the number of facilitator input segments, and the order of input and practice segments. Initially, it was planned that each session topic would have a separate observation form, but piloting demonstrated that one observation form could be used to capture all session topics, thus serving to facilitate easier comparison.

The final iteration of the form resulted in two new parts: 1) to capture data around instruction and instructor input; and 2) to capture data around participant practice and engagement. This two-part structure was included for each 'segment' of the class, which was typically aligned with a particular step within each recipe, for example, chopping onions. Free-text boxes were included within each part of the form to capture data about what was taking place in relation to the pre-specified topic areas, for example, nutrition information or technique instruction. Observer judgement of teaching style and participant engagement was noted using forced choice, tick-box responses. A list of BCTs and nutritional messages that had been identified in the manual, and thus were expected to occur, was provided to allow the observer to mark which had occurred.

2.2.3. Observations

Sampling and inclusion

Initially, it was planned that two observations would take place at each of the six JOMoF sites. However, because of three sites ceasing to continue aligned to JOMoF, the final schedule of observations differed slightly. Table 6 shows which classes were observed at which sites; the sites have been anonymised. Observations were not necessarily planned to be conducted in classes in which pilot study participants were attending.

As each centre does not run courses in the same order of topics (i.e. week 2 for one centre may be meat, while week 2 for another centre may be vegetables), sessions that were observed were selected by topic, not by week number. This was so we could observe some topics at multiple sites. The selection of topics was a pragmatic choice, based initially to ensure that the first class in the course was not observed, and secondly on cost and logistical requirements to observe classes in tandem with other fieldwork. The rationale for not wanting to observe the first class in the course was to avoid disturbing the dynamic of the class when participants are likely to be most apprehensive about attending.

In total, 12 sessions were selected for observation. The only criterion for inclusion of a class was that it was a class that was open to the general public (i.e. not a commissioned class for a specific group or organisation). All topics were observed with the exception of 'eggs and breakfast' and 'chicken'. Classes were observed that took place at various times of the day and days of the week, including evenings and weekends.

Classes on the same topic were observed at different sites to allow comparisons between sites and overarching common 'themes' across sites to be explored. Three of the 12 sessions were observed by two researchers to compare the reliability of observations.

Table 6: Topics of sessions observed at each site

Site	Class observed
A	Grains (pasta) Vegetables (veggie curry) Fish Grains (pasta)
B	Meat (hotpot) Grains (jambalaya) Meat (hotpot) Fish
C	Meat (chilli) Baking (pizza) Soup Baking (pizza)

Ethics and recruitment

Prior to commencement of planning for the observations, verbal consent was obtained from the project manager at each site. Following this overall agreement, and prior to observation of individual sessions, verbal consent was obtained from the session instructor. The instructor then obtained verbal agreement from all class members, and gave written informed consent for the observation on behalf of the class. As most study participants were distributed across existing classes, and thus were mixed with other members of the public who were not part of the study, classes were not necessarily observed that contained study participants. Hence, this is why there would be inherent difficulties in audio- or video-recording observations (see discussion), as there were no classes made up solely of intervention attendees. Written informed consent was not obtained from individual participants in the sessions as no personal information about participants was collected and the observations focused on the tutors and the session itself. Instructors were reassured that should a member of the class object to the observation taking place, either prior to or during the observation, the observation would be terminated and another class would be observed instead.

Observation procedure

During the observation, the researcher attempted to place themselves in an unobtrusive location as possible, out of the direct eye line of participants but able to see them practising the cooking skills and interactions between the instructor and participants; the researcher, where practicable, did not join in conversation or ask any questions. Following the observation, the researcher conducted a short debrief with the instructor, to ascertain whether the session was typical and to give the instructor the chance to ask any questions. At the end of the session, the researcher then completed the tick-box section of the observation form relating to BCTs and nutritional messages.

2.3. Results

The following section describes the theoretical basis of the course, and answers research question 7:

What is the theoretical basis, in terms of behaviour change, of the JOMoF cooking skills intervention?

2.3.1. Manual analysis

After systematically coding each session outline from the manual, we concluded that few BCTs were present in the course. The BCTs identified were typically repeated across most sessions, as can be seen in table 7 below.

Note. The numbers next to the BCTs relate to the number given to that technique in the taxonomy.

The main techniques that were described across the majority of the sessions were:

- (1) Provide information on the consequences of the behaviour in general
- (5) Goal setting – behaviour
- (10) Prompt review of behavioural goals
- (15) Prompting generalisation of target behaviour
- (21) Provide instruction on how to perform the behaviour
- (22) Model/demonstrate the behaviour
- (26) Prompt practice.

The course manual implied a common structure and common use of BCTs across the different sessions, and ostensibly, across different sites too. BCT 1 - ***Provide information on consequences of behaviour in general***

This BCT was typically described as being used during the introduction to the session, when the instructor would be expected to give a brief overview of the session's topic and aims, and provide information on some benefits of both cooking from scratch, and of consuming the food or type of food that they would be preparing. Common themes described that would be examples of this BCT included telling participants how they could save money by cooking from scratch, and how they would be able to control what ingredients were used and so be able to make healthier meals by using less salt and oil, for example. Examples of text mapped to this technique are shown in Box 1.

Some examples of this type of information, whilst perhaps seeming like common sense, are not supported by the current evidence base. For example, the manual suggested instructors could tell people how a lack of cooking skills had led to obesity and other diet-related diseases.

Figure 1 shows the typical class structure and flow as described, with positioning of BCTs. Further on in this section, actual versus described class structures are compared.

Some examples of extracted text that were mapped to each of these techniques are shown over the subsequent pages.

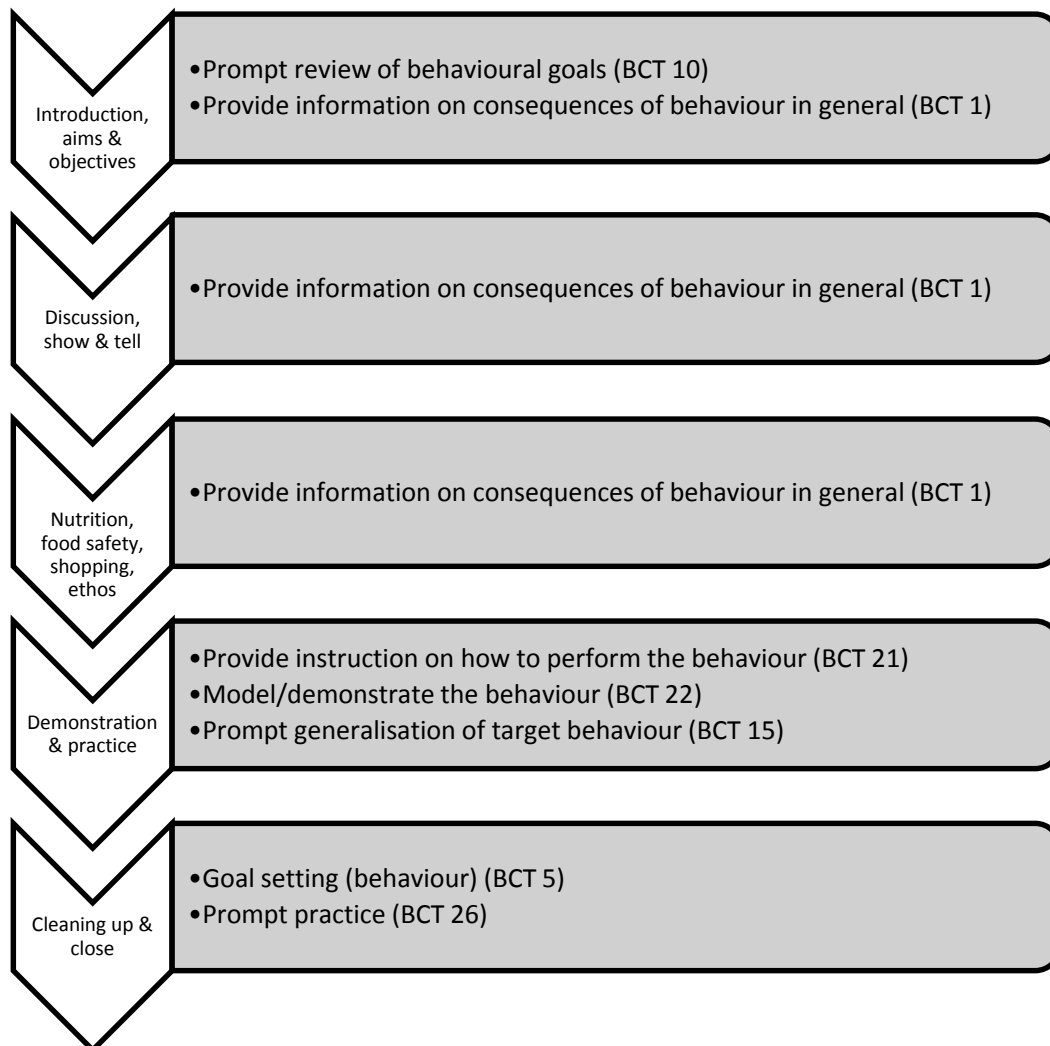
BCT 1 - Provide information on consequences of behaviour in general

This BCT was typically described as being used during the introduction to the session, when the instructor would be expected to give a brief overview of the session's topic and aims, and provide information on some benefits of both cooking from scratch, and of consuming the food or type of food that they would be preparing. Common themes described that would be examples of this BCT included telling participants how they could save money by cooking from scratch, and how they

would be able to control what ingredients were used and so be able to make healthier meals by using less salt and oil, for example. Examples of text mapped to this technique are shown in Box 1.

Some examples of this type of information, whilst perhaps seeming like common sense, are not supported by the current evidence base. For example, the manual suggested instructors could tell people how a lack of cooking skills had led to obesity and other diet-related diseases.

Figure 1: Flowchart of session outline, as described in the course manual - shows BCTs mapped onto the part of the class in which they were most likely to occur



Box 1: Extracts from the manual that were mapped to BCT 1 - Provide information on consequences of behaviour in general

[Eggs] *"People don't know how to cook ... This has led to a huge problem in this country with more people suffering from obesity and diet-related disease such as diabetes and heart disease."*

[Breakfast] *"A balanced nutritious breakfast will stop you grabbing mid-morning snacks which are usually high in fat and sugar."*

[Meat] *"Talk about the benefits of making your own from scratch. Talk about the price and how in some cases it is quicker to make your own from scratch than heating up a shop-bought product."*

[Salad & vegetables] *"5-a-day has been proven to reduce the risk of cancer, stroke, heart disease and obesity. Fruit and vegetables are essential elements of a balanced diet and can help us maintain a healthy weight. They provide us with a variety of vitamins and minerals."*

[Baking] *"Research shows that people who eat more wholegrain food may be protected against coronary heart disease."*

Table 7: Table of BCTs present in the manual, by class (a tick represents a minimum of one occurrence of the usage of that BCT. Remainder of the 40 BCTs that are not shown were not present in the manual at all).

Technique	Class							
	Eggs & breakfast	Soup & salad	Pasta	Meat	Veg	Chicken	Fish	Baking
1. Provide information about consequences of behaviour in general	✓	✓	✓	✓	✓	✓	✓	✓
5. Goal setting (behaviour)	✓	✓	✓	✓	✓	✓	✓	✓
9. Set graded tasks	✓	x	x	x	x	x	x	x
10. Prompt review of behavioural goals	✓	✓	✓	✓	✓	✓	✓	✓
14. Shaping	x	✓	x	x	x	x	x	x
15. Prompting generalisation of target behaviour	✓	✓	✓	✓	✓	✓	✓	✓
21. Provide instruction on how to perform behaviour	✓	✓	✓	✓	✓	✓	✓	✓
22. Model/demonstrate the behaviour	✓	✓	✓	✓	✓	✓	✓	✓
24. Environmental restructuring	x	✓	x	x	x	x	x	x
26. Prompt practice	✓	✓	✓	✓	✓	✓	✓	✓

BCT 5 - Goal setting (behaviour)

Examples of this BCT were frequently present towards the end of the session, when the manual described how the instructor would be expected to summarise what the participants had covered during the lesson and set 'soft' targets, that is, instructors were described as providing encouragement rather than specific, individual targets. Examples of text mapped to this technique are shown in Box 2.

Box 2: Extracts from the manual that were mapped to BCT 5 - Goal setting (behaviour)

[Soup] *"Remind your students to practice their knife skills whenever they get the chance. Making more soup at home is good for practice."*

[Meat] *"Ask your students to practice what they have learnt today and challenge them to make a home-made version of their favourite take away dish."*

[Salad] *"Challenge your class to experiment with different leaves, herbs and vegetables. Ask them to try making a chopped salad, which is great for kids, or their own jam jar dressing."*

[Vegetables] *"Ask your students to try making a vegetarian meal at home, especially using ingredients they've never had before."*

[Baking] *"Challenge your students to make a cake or pizza instead of buying one."*

BCT 10 - Prompt review of behavioural goals

This BCT was typically described as being used during the beginning of the session, when the instructor would greet participants and ask them whether they tried to make use of any skills or techniques learnt in the previous week's session; this prompting was related to the 'soft' behavioural goals, such as prompting. The recurring description that was mapped to this BCT was:

"...chat about last week's recipe: did anyone practice last week's recipe? How did they turn out? If not, did anyone try to cook something else?"

BCT 15 - Prompting generalisation of target behaviour

Comments that were mapped to this BCT were less specific in nature, but suggested that instructors should make a comment about how the BCT could be used in other circumstances. Some comments that were mapped to this section were also mapped to BCT 5 – goal setting (behaviour) – because of their suggested encouragement to practice skills *per se*, rather than the particular dish that had been used in the class. Examples of text mapped to this BCT can be found in Box 3.

Box 3: Extracts from the manual that were mapped to BCT 15 - Prompting generalisation of target behaviour

[Breakfast] *"Encourage your students to make time to have a decent breakfast and to try a variety of breakfast foods until they find one that works for them."*

[Pasta] *"...to teach students how to cook great pasta dishes from scratch, and encourage them to do so at home"*

[Meat] *"Ask your students to practice what they have learnt today and challenge them to make a home-made version of their favourite take away dish."*

BCT 21 - Provide instruction on how to perform the behaviour

Text extracts that were mapped to this BCT were frequently also mapped to BCT 22 – model/demonstrate the behaviour – because participants were often provided instruction at the same time as the instructor was demonstrating the technique. However, there were some examples of instruction being provided without demonstration, such as in the case of ancillary information being provided, or ‘what if’ clauses; such examples are used in Box 4.

Along with BCT 22 (model/demonstrate the behaviour), BCT 21 was by far the most frequently used technique that was described in the manual. The manual indicates that the majority of time should be dedicated to showing participants how to perform particular cooking skills, along with verbal instruction, followed by the participants practising the skills themselves. For each session, the manual described many different learning points and comments which were mapped to this technique, not only encompassing cooking skills, but also healthy eating, shopping tips and messages around ethos.

Box 4: Extracts from the manual that were mapped to BCT 21 - Provide instruction on how to perform the behaviour

[Soup] *“Always clean vegetables really well to remove dirt, especially from farm-bought ones. To wash a large amount of vegetables at once, fill up a clean sink with cold water and give the vegetables a quick soak.”*

[Meat] *“Trim the visible fat; instead of frying choose healthier cooking methods such as grilling, roasting, and barbecuing; when using meat in soups and stews, skim any fat that rises to the top.”*

[Salad] *“Dress your salad just before serving. If it is dressed too far in advance it will wilt. Add your dressing a little at a time, toss the salad, taste it and then gradually add more if needed.”*

[Fish] *“Talk about how to buy fish and how to tell if it's fresh.”*

BCT 22 - Model/demonstrate the behaviour

In most cases, this BCT was identified as occurring concurrent with BCT 21 – provide instruction on how to perform the behaviour – and was related to the modelling or demonstrating of cooking techniques, such as chopping. Because of the demonstrative and interactive nature of the course, as described in the manual, this technique was frequently identified as being described or implicit in the aims of the session. Examples of text mapped to this BCT are shown in Box 5.

Box 5: Extracts from the manual that were mapped to BCT 22 - model/demonstrate the behaviour

[Soup] *“...three main chopping techniques: rock, cross and tap.”*

[Breakfast] *“Serve up the breakfast showing what is an appropriate serving size.”*

[Meat] *“Demonstrate the techniques involved in cooking meat and how to tell if it's cooked.”*

[Salad] *“Show how to wash and prepare lettuce.”*

[Fish] *“Show students advanced knife skills”*

[Baking] *“Demonstrate different techniques used in baking; show kneading, if making bread dough.”*

BCT 26 - Prompt practice

This BCT was typically described towards the end of sessions, as participants had practised the skills that were being learned that day. There was overlap between this BCT and BCT 5 – goal setting (behaviour) – because of the ambiguity in the manual as to whether the goal setting was specific, or

whether it was a more general prompting of practice. Examples of text mapped to this BCT are shown in Box 6.

Box 6: Extracts from the manual that were mapped to BCT 26 - Prompt practice

[Eggs] *“Encourage students to practice making eggs at home - and let them know that you'd like to know how they got on.”*

[Breakfast] *“Encourage your students to make time to have a decent breakfast.”*

[Pasta] *“Ask your students to practice what's been learned today and experiment with making sauces.”*

Theoretical basis

The review of the manual revealed no explicit discussion of the course's theoretical basis, or the way in which it seeks to impact on behaviour. Specific BCTs were identified in the manual. However, although the course lacks an explicit theoretical basis, the BCTs identified align with some of the principles of Bandura's Social Cognitive Theory⁹³ and Kolb's Experiential Learning Theory.⁹⁴ The evaluation of the JOMoF intervention in Australia also suggests these underpinning theories.⁵⁶

From the perspective of Social Cognitive Theory, the cooking skills course, based on interpretations of the manual, could be seen as seeking to: help individuals to overcome some of the barriers that stop them from adopting a healthier diet, that is, their lack of cooking skills or knowledge of cooking techniques; motivate individuals by providing information about how the changes in their behaviour can benefit their health and wellbeing; and provide interactive guidance to help individuals master the skill of cooking, in a social context.⁹³ From the perspective of Experiential Learning Theory, the manual suggests that the cooking skills course aims to provide the key element of concrete experience, which is posited to be central to learning, as opposed to abstract descriptions. By being in receipt of concrete experience during the learning process, the individual's motivation to learn increases, which, in turn, is then hypothesised to lead to a change in knowledge and behaviours.⁹⁴

2.3.2. Observations

In the following section, the following two research questions will be addressed:

7. *What is the fidelity of the JOMoF cooking skills intervention?*
8. *Are there temporal or locational variations in intervention fidelity?*

To address fidelity, we sought to understand whether the intervention was implemented as intended, and whether there were variations within and between centres, in terms of style, content and participant engagement.

To understand whether the intervention was implemented as intended we compared the intervention as observed, with the intervention as described (in the manual); this assessment is addressed in 0. Differences between and within centres are also described in section 0, to explore variations in fidelity.

The observations revealed that the structure of the classes varied between sites, and also, to some extent, within sites. In the manual, the implicit class structure was essentially linear, as shown in Figure 1. Observations revealed that the flow between segments was more variable, with some parts interspersed throughout the class, such as information on ethos, food safety and nutrition.

Coverage of manual content

Specific elements of the manual were covered more consistently than others, which are detailed below. While the manual, for each class in the course, provides detailed information that could be given about nutrition, ethos, shopping and budgeting advice, and the benefits of cooking from scratch, this information was much less consistently provided, and when it was provided, was often inconsistent and piecemeal. However, the core information about cooking skills and techniques was consistently provided, mostly in a detailed way that was consistent between and within the different centres.

Figure 2Error! Reference source not found. shows a conceptual model of the current intervention structure, emphasis and influences, as determined by the observations that were conducted. The model shows that cooking skills are the foundation of the model and the consistent topic to which everything else is ancillary. On top of cooking skills instruction are the provision of nutritional information, which was a prominent, but slightly inconsistent, feature, and information about the benefits of cooking from scratch, which was a smaller component. At the top of the model, representing the most variable elements, are the provision of shopping and budgeting information and information about food ethos; arguably these are of the least importance to the intervention. This 'building block' model is framed by other factors which appear to influence the intervention, including: the context of the site and its setup, and aims and ethos of its parent organisation; the physical location and facilities; the experience, personality and teaching style of the instructor; and the personalities of the participants in each group. As these other factors can arguably be less readily influenced than the course content, any suggestions for improvement for the course should be based around the course content, but should not neglect to take into account these important contextual factors.

Figure 2: Model of the observed 'building blocks' and framing of the cooking skills course; the 'building blocks' are scaled to the approximate contribution of each of the main element.

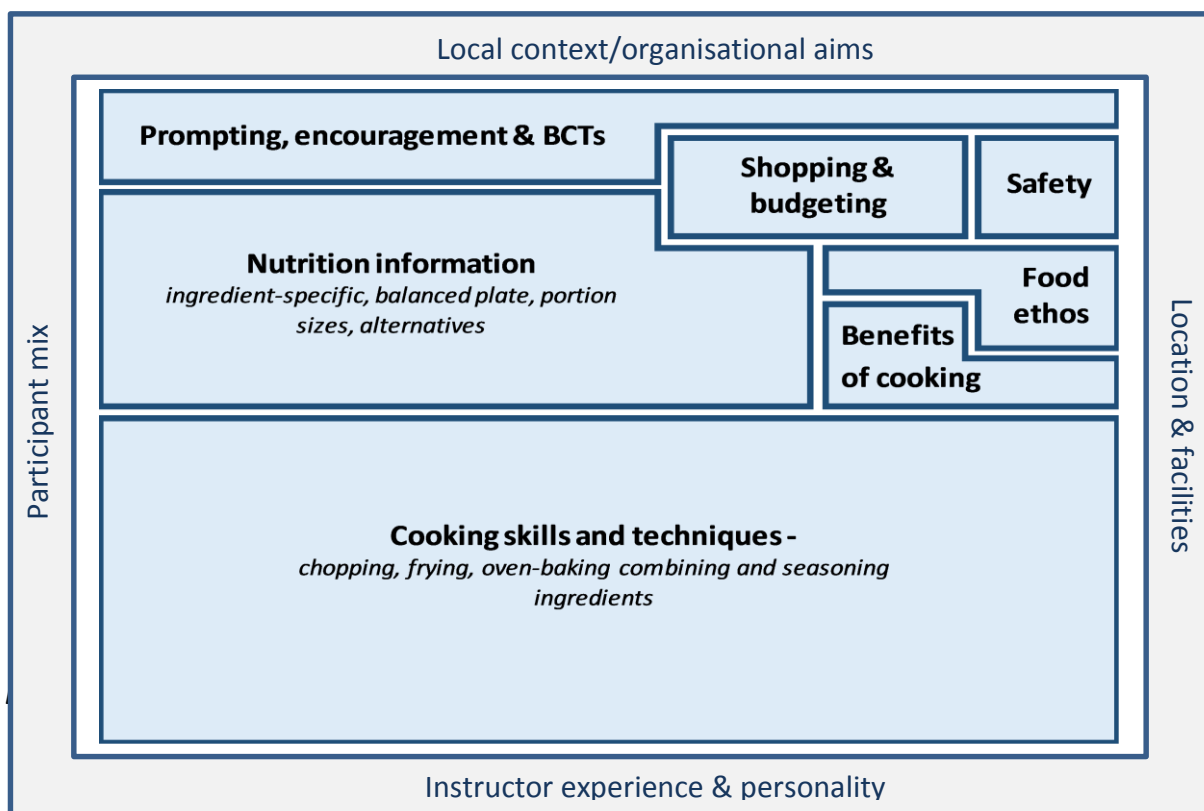


Table 8 shows a comparison of the BCTs that were identified in the manual and those that were observed during classes. The table shows an aggregate of the BCTs that were observed; the presence and absence differed slightly by observation.

The BCTs that were most consistently seen in the observations were: (1) ‘provide information on consequences of behaviour in general’; (10) ‘prompt review of behavioural goals’; (21) ‘provide instruction on how to perform the behaviour’; (22) ‘model/demonstrate the behaviour’; and (26) ‘prompt practice’.

Other BCTs that were less consistently observed were: (4) ‘provide normative information about others’ behaviour’; (12) ‘provide rewards contingent on effort of progress towards behaviour’; (13) ‘provide rewards contingent on successful behaviour’; and (15) ‘prompting generalisation of target behaviour’.

Table 8: Comparison of BCTs expected (from analysis of the manual) and observed during JOMoF classes (a tick represents a minimum of one occurrence of the usage of that BCT. BCTs that are not shown were not present in the manual or observations at all.^a)

Technique	Soup		Pasta		Meat		Veg		Fish		Baking	
	Man.	Obs.	Man.	Obs.	Man.	Obs.	Man.	Obs.	Man.	Obs.	Man.	Obs.
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	x	x	x	x	x	✓	x	✓	x	x	x	✓
5	✓	x	✓	x	✓	x	✓	x	✓	x	✓	x
9	x	✓	x	x	x	x	x	x	x	x	x	x
10	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	x
12	x	x	x	x	x	✓	x	x	x	x	x	✓
13	x	x	x	✓	x	✓	x	✓	x	x	x	✓
14	✓	x	x	x	x	x	x	x	x	x	x	x
15	x	x	✓	✓	✓	x	✓	✓	✓	x	✓	x
21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

a – a full description of all BCTs can be found in Table D in the appendix.

The presence or absence of BCTs also differed by site, when the same topic was observed at different sites. However, from the small number of observations it was not possible to infer any pattern in the use of BCTs; the topic and instructor appeared to be the most likely source of variation. Some BCTs that were expected did not occur as often as expected; these were mainly BCT (5) “goal setting (behaviour)” and BCT (10) “prompt review of behavioural goals”.

There were, however, more cases of BCTs observed that were not expected. For example, BCT (4) “provide normative information about others’ behaviour” was observed on three occasions. Examples of this include when an instructor prompted all participants, at the beginning of the session, to say where they bought their pizzas from normally and what kind of toppings they had, or when an instructor prompted participants to say whether anyone had ever made soup at home

before, and if so, what they usually made. Another example of a BCT observed but not in the manual was BCT (13) “prompt rewards contingent on successful behaviour”, which was observed on four occasions. Examples of this include when an instructor was seen to give verbal praise to specific participants when they had chopped something correctly. However, these additional BCTs were not consistent between classes.

Nutrition messages

Table 9 shows the difference between what was expected to occur and which messages were actually observed. There are a large number of differences between what was expected to be covered, based on the manual, and what was observed. This suggests that the manual acts more as a guide to the setup and format of sessions, but that the specific content is much less reliant on the manual.

The most consistent nutrition messages were related to the balanced plate and how to balance the dish being served (by addition of vegetables, for example), and portion sizes. There were also frequent mentions of carbohydrates and their role in a balanced diet, sources of fat in the diet, the benefits of 5-a-day and ways to incorporate more fruit and vegetables into the diet, and salt and its recommended level of intake. However, there was inconsistency both within and between sites in the way that nutritional messages were incorporated. There were also differences in the ways that nutrition messages were conveyed, with some instructors dedicating a part of the session to focus on nutrition, and others mentioning nutrition in a more ad-hoc way.

Interestingly, there were many occasions where additional nutrition messages were being provided beyond those that were expected, as instructors embellished upon the given material and provided more information than suggested. Whilst this could be seen by some as beneficial, and may indeed have been appreciated by some of the participants, it was perceived by the observers that the provision of too much information meant that its delivery was often rushed, and that too many complex nutrition-related messages were being skimmed over. Thus, these messages were deemed unlikely to have been effective in increasing overall nutrition knowledge, and fewer messages, given with more reinforcement, may be preferable.

Table 9: Comparison of nutrition messages between those expected based on the analysis of the manual, and those observed during classes.

Message	Soup		Pasta		Meat		Vegetables		Fish		Baking	
	Man	Obs	Man	Obs	Man	Obs	Man	Obs	Man	Obs	Man	Obs
Sugar – effects on health	x	x	x	✓	x	✓	x	x	x	x	✓	x
Sugar – labelling	x	✓	x	x	x	x	x	x	x	x	✓	x
Sugar – nomenclature	x	x	x	x	x	x	x	x	x	x	✓	x
Carbohydrates – part of balanced diet	x	x	✓	✓	x	✓	x	✓	x	✓	✓	✓
Carbohydrates – simple vs complex	x	x	✓	✓	x	✓	x	✓	x	x	✓	x
Fat – sources	x	x	x	✓	✓	✓	x	x	✓	✓	x	x
Fat – replacements low for high	x	x	x	x	✓	x	x	x	x	✓	x	✓
Fat – ways to make low fat	x	x	x	x	✓	x	x	x	x	x	x	x
Fish – omega-3 and -6	x	x	x	x	x	x	x	x	✓	✓	x	x
White vs oily fish	x	x	x	x	x	x	x	x	✓	✓	x	x
Wholegrain – sources	x	✓	✓	✓	x	x	x	x	x	x	✓	x
High fibre – sources	x	x	✓	✓	x	x	x	x	x	x	✓	x
Salt – limits	✓	x	x	✓	✓	✓	x	x	x	✓	x	x
Salt – food labels	✓	✓	x	✓	✓	x	x	x	x	x	x	x
5-a-day – benefits	✓	x	x	✓	x	✓	✓	✓	x	✓	x	x
5-a-day – what counts	x	x	x	✓	x	x	✓	✓	x	✓	x	x
5-a-day – how to incorporate more	x	x	x	✓	x	✓	✓	✓	x	x	x	x
Guideline Daily Amounts – how to use	✓	x	x	x	x	x	x	x	x	✓	x	✓
Balanced plate – explanation	✓	x	✓	✓	✓	✓	✓	✓	x	✓	x	✓
How to balance dish being made	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Portion sizes	✓	x	✓	✓	✓	✓	✓	✓	✓	x	✓	✓

Man = identified in manual; Obs = observed in class

Physical setup of classes

There were physical differences between each centre which appeared to influence the structure and flow of the class, and the way in which actual cooking skills were taught and supervised. Two of the centres where sessions were observed had semi-circular workstations surrounding the instructor, resulting in a 'cook-along' type of class. The other site had multiple blocks of workbenches which were not centred around the instructor, resulting in participants having to break off from cooking to go and observe the instructor before returning to their workbenches. Photographs taken at each of the centres are shown in Figure 3 - Figure 5, demonstrating the different setups of the kitchens.

Figure 3: Picture of a Ministry of Food kitchen, in 'semi-circle' style



Structure of classes

The basic structure of the class was similar across sites, with each session beginning with a brief introduction, followed by a demonstration. Demonstrations either involved participants practising alongside the instructor, or a more staggered segmenting with participants practicing in between demonstration segments. Sessions ended with a brief segment where participants tried the food that they had been cooking and then assisted with cleaning. The main differences were in the teaching style of the instructor, the things that the instructor said or interactions between participants.

Figure 4: Picture of a Ministry of Food kitchen, in 'semi-circle' style



Figure 5: Picture of a Ministry of Food kitchen, in individual bench style



Class length and time for practice

Table 10 provides details of the topics, class timings, and class composition of the classes that were observed. The overall length of classes and the time dedicated to participant practice varied between classes and both between and within sites. The average length of the sessions that were observed was 78 minutes, although session length ranged from 60 to 95 minutes. In sites with a semi-circular, 'cook-along' type setup, there tended to be more chance for participants to practice the techniques due to the lack of interruption BY having to return to the instructor's workbench. Overall, the

average time spent in demonstrating was 50 minutes, but this ranged from 31 to 80 minutes, while the average time participants spent practising was 38 minutes, ranging from 24 to 57 minutes. However, to take into account session length, the ratio of time spent demonstrating to time spent practising was calculated. This showed that the average ratio of time spent practising to demonstration was 0.8, but with a range from 0.4 to 1.7. Excluding the session with a ratio of 1.7 (because of the anomalous ratio compared to the other observations) reduced the average ratio to 0.7. In practical terms, this means that for approximately every 10 minutes spent demonstrating, between 7 and 8 minutes is spent by participants practising skills. These times may also not be mutually exclusive, as demonstration and practice tended to overlap at two of the sites where sessions were observed.

Table 10: Details of classes that were observed at each site (Note that the time spent in demonstration and practice may not add up to the total length of the class, as there was often overlap between the segments)

		Class topic	No. participants	No. instructors	No. volunteers	Session length ¹	Time spent in demo. ¹	Time spent in practice ¹	Ratio of practice to demo
Site A	1	Grains	4	1	1	85	70	57	0.8
	2	Vegetables	2	1	0	90	61	36	0.6
	3	Fish	6	1	1	95	80	56	0.7
	4	Grains	5 (+1 carer)	1	0	87	79	33	0.4
Site B	5	Meat	3	1	1	80	38	32	0.8
	6	Grains	4	1	2	85	31	54	1.7
	7	Meat	2	1	3	62	33	24	0.7
	8	Fish	5	1	2	60	35	26	0.7
Site C	9	Meat	4	1	0	60	40	45	1.1
	10	Baking	9	1	0	75	34	30	0.9
	11	Soup	8	2	0	71	50	40	0.8
	12	Baking	4	1	0	80	54	26	0.5

¹ – times shown are in minutes

There appear to a number of reasons for the variation in session length, including the class topic, the instructor's speed and experience, the time of day of the class, whether the class started late because of latecomers, and number of attendees. Levels of attendance varied from as low as 2, up to 9, with an average of 5 participants per class. The presence of volunteers to assist with the running of the class also varied, with 6 of the 12 classes observed having no volunteers, 3 classes having 1 volunteer, 2 classes having 2 volunteers and 1 class having 3 volunteers; one of the three sites consistently had volunteers present while one site consistently had no volunteers.

House rules and branding

All sites site had consistently clean and well-presented teaching areas. At the beginning of each session, a brief overview of the session was given, which included the aims and focus of the session, although some instructors provided more detail than others. There were few observations of reiteration of the 'house rules' given at the beginning of the session (hand washing, mobile phones switched off, not to carry knives or hot pans around), which the manual recommends always giving. However, this did not seem to be necessary, as most participants washed their hands before

beginning (some prompted) and no instances of dangerous practices were observed. Thus it may be assumed that giving these in the first session is sufficient and that the centres, from experience, recognise this.

Two of the centres had prominent Ministry of Food branding and presence of some Jamie Oliver products, such as cookbooks. The third centre had minimal branding, but this site also ran non-JOMoF cooking skills courses. During the classes, references to Ministry of Food or to Jamie Oliver were sporadic.

Teaching style & participant engagement

The styles of teaching differed slightly between centres and also within centres. Some instructors had a more didactic style, whilst others possessed a more interactive style. Some parts of the sessions observed also seemed to naturally lend themselves to more interaction and engagement with participants, although overall the sessions that were observed had a greater proportion of didactic elements than interactive. An example of part of the class that was typically more interactive would be when instructors introduced the session and asked participants if they had tried to make a certain dish before, or asked what their favourite flavour or variety of food was in relation to the dish they were making. The actual demonstration and instruction of specific skills tended to be more didactic, although the instructor would usually be carrying out a particular action whilst instructing.

The emphasis different instructors placed upon different parts of the course was variable and appeared to be partly influenced by site. At one of the sites, greater emphasis appeared to be placed on nutritional information, and to a lesser extent, ethical information. In contrast, at another of the sites, more emphasis was placed on the imparting of knowledge relating to cooking skills and techniques, although some information was still given about nutrition. The third site was more balanced in the emphasis placed on nutrition and cooking skills, although there was still variation between instructors.

The apparent interest of participants and their engagement with the course appeared to be good. Participants mostly appeared to listen to the facilitator and follow the instructions that were given. However, participants did not always appear to be confident, or feel the need to, ask questions, with most participants not choosing to do so. However, these assessments of confidence were based on observer judgement and therefore subjective – typical features that might have denoted lack of confidence were slowness compared to other class members, glancing at other participants' workbenches to look at their actions, and asking others for help or guidance. It was noted that there tended to be an absence of the instructors checking back with participants to see whether they had understood information or instructions had been given.

Interaction between participants was also varied, which impacted upon the overall feeling of 'liveliness' and 'energy' of the class. In some classes, there were participants who knew one another and interacted, while in others classes there was little interaction or socialisation between participants – however, often participants appeared engrossed in the prescribed tasks which may have served to dampen this, at least in some parts of the class. Overall, the dynamic of the class seemed to vary according to the instructors' personalities and teaching style, physical setup, session topic, and participants' own personalities.

Similarities and differences between and within sites

The themes that sites had most in common were hygiene, prompting to try making the dish at home, information about salt, information about the balanced plate (also known to as the Eatwell plate),⁹⁵ good temperature control of the hob, advice about shopping and understanding food labels, information about portion sizes, and substituting ingredients and adapting recipes.

Two of the course topics were observed at two different sites, allowing a comparison of similarities and differences of the same class taught in different locations. We also observed some of the same class topics within two of the locations: at the first site, four different classes were observed over three different topics (one topic observed twice) and three different facilitators; at the second site, four different classes were also observed over three different topics, but only two different facilitators.

In all sessions that were observed there was instruction and demonstration of cooking skills and techniques, such as peeling, chopping, mixing, seasoning, frying and oven-baking. This was common between all sites and all instructors, and appeared to be the core element of the sessions that were observed. Beyond the teaching of practical cooking skills and techniques, coverage of the manual and consistency between instructors and sites was more variable, with different emphasis given to different topic areas.

Table 11: Case study comparison of the same topic (grains – pasta or rice dish) at two different sites. Table 11 illustrates the similarities and differences seen when the same class topic was observed at two different sites. The class topic was ‘grains’, which could include both pasta- and rice-based dishes. As the illustration demonstrates, there were some similarities in the overarching themes of information that was provided; instructors tended to provide information about portion sizes, the balanced plate, and recipe-relevant nutritional information, however, the specific message and level of detail varied.

In addition to the differences that existed between different sites, differences were also apparent within sites, depending mainly upon the instructor and the class topic. These are described below.

Table 11: Case study comparison of the same topic (grains – pasta or rice dish) at two different sites.

	SITE A	SITE B
Dish	Pasta and sauce	Rice and meat dish
No. Participants	5	4
No. Volunteers	0	2
Session length	1h 25m	1h 25m
Demonstration Time	70m	31m
Practice time	57m	54m
Time of day	Early afternoon	Early evening
Nutritional information	<ul style="list-style-type: none"> -Benefits of wholegrain – including how to incorporate into diet -Explains difference between pure fruit juice and juice drink -Says that shop-bought salad dressing are high in fat and salt -Says pure sea salt is ‘stronger’ and so don’t need to use as much -Explains hard cheese is high in saturated fat and so should use sparingly -Explains alternative reduced-fat ricotta -Explains the Balanced Plate and how the dish maps onto it -Advises to add salad to the dish 	<ul style="list-style-type: none"> -Explains what one portion of veg is and demonstrates using palm of hand -Explains carrots contain vitamin A and carrots contain lycopene, and what each is good for -Explains garlic and onion have antiseptic and anti-inflammatory properties -Says no need to add oil when cooking with chorizo -Says olive oil is good because it contains ‘good’, unsaturated fat which counteracts ‘bad’ fat and cholesterol -Explains what correct portion size for meat and fish should be -Explains that stock cubes are high in salt
Welfare/ethos	<ul style="list-style-type: none"> -Explains how pre-made/shop-bought dressings are high in additives, whereas a home-made dressing is ‘simple’ 	<ul style="list-style-type: none"> -Tells participants that organic, free-range eggs are higher welfare but cost and taste the same
Shopping & budgeting advice	<ul style="list-style-type: none"> -Tells participants that wholegrain isn’t more expensive than white pasta -Talks about different types of pasta and their suitability -Talks about different types of hard cheese and to check labels if vegetarian -Says that pasta dishes are cheap and easy -Explains that balsamic vinegar can be expensive, but a cheap bottle can be bought and boiled down to sweeten -Says that lettuce is very cheap to buy -Explains how to keep opened salad items fresh by keeping in aerated bag -Explains the sauce made is a basic tomato sauce and can be used for other dishes, such as chilli 	<ul style="list-style-type: none"> -Tells participants that dried spices are cheap to buy and last a long time -Explains plain flour can be used instead of self-raising, but with raising agents -Explains jambalaya is good for using up leftovers as can add other meats to it
Practical hints and tips	<ul style="list-style-type: none"> -Other soft cheeses can be used -Talks about different cooking methods for onions -Pasta can dry out if cooked cooled -Tells not to add salad dressing before ready to eat as will make soggy 	<ul style="list-style-type: none"> -Explains that always need to wash hands after handling raw chicken

Differences within centres

All instructors at site A provided detailed commentary about the nutrition of the ingredients that they were using for the recipe. They also provided many, varied brief comments on topics such as the

benefits of cooking and the disadvantages of buying shop-bought food, 5-a-day, the balanced plate, alternative ingredients for those being used, food storage and flavouring ingredients. In all classes, there were detailed demonstrations and instructions given for chopping and temperature control if frying, as well as briefer instructions for adding oils and other ingredients, cooking tips, preparation such as oven-warming and washing vegetables. In all classes, participants practiced chopping vegetables and cooking food on the hob or in the oven.

At site B, volunteers were present in addition to the instructor. In two of the classes that were observed at this site, the observer did not judge any of the instructor's comment to be detailed, rather they were all deemed brief. In the other two classes, there were only a small number of detailed comments, which related to ingredient-specific nutrition and food ethics (free-range eggs). There were, however, many brief comments covering most aspects of the class, including nutrition, the balanced plate, alternative uses for ingredients, nutrition, portion size and 5-a-day.

At site C, detailed comments were more consistently given about ingredients that were being used in the recipes, portion sizes and shop-bought alternatives. More brief comments were made around sourcing of meat, the benefits of cooking from scratch, the balanced plate and adaptation of recipes. As with the other sites, all classes involved detailed instruction about the preparation of ingredients, either chopping or kneading dough, with briefer instructions on frying, combining ingredients and checking when food is cooked. All participants practised the techniques that were being taught in the class.

Inter-rater reliability

Three of the twelve observations that were conducted were observed by two members of the research team. The purpose of this was to compare observations to ensure that there was consistency between observers and that the observation protocol was fit for purpose in collecting the relevant and necessary data.

However, given that the data collected during the observations were primarily qualitative in nature, any sophisticated statistical comparisons were impossible. Table 12 shows Cohen's kappa statistic for the tick-box part of the observation form that was completed to measure the presence or absence of specific nutrition messages and BCTs that were expected to be observed, based on the analysis of the course manual.

Table 12: Cohen's kappa statistic for agreement between present/absent ratings for nutrition messages and BCTs

	<i>Observation 1</i>	<i>Observation 2</i>	<i>Observation 3</i>
BCTs	-	1.0 (1.0, 1.0)	0.8 (0.3, 1.0)
Nutrition	0.4 (0.0, 0.9)	0.9 (0.7, 1.0)	0.1 (0.0, 0.6)

2.4 Discussion

2.4.1 Summary of principal findings

The results of the manual analysis, coupled with the observations, have helped us to establish that there is no explicit theoretical basis for the intervention, although BCTs were both implicit in the course manual and were observed during in-person observations. These specific techniques, such as such as modelling and demonstration of cooking skills techniques, and prompting participants to practice skills and dishes at home, may contribute towards changing participants' cooking behaviour.⁹⁶⁻⁹⁹

The observations revealed that there were some elements of the course that were consistently delivered across all centres, and other elements that were less consistent between centres. The elements that were consistently delivered were instructions around specific cooking skills and techniques. The less consistent elements included messages related to nutrition, food ethos, and shopping and budgeting tips.

We also determined from the observations that there were both temporal and locational variations in intervention fidelity. Some of these differences may be attributable to contextual differences between the intervention's host organisations, while some may be attributable to individual instructors' background and experiences. Such differences included differences in class timings, the ratio of participant practice to instructor demonstration, the level of interaction between participants and instructors, and the emphasis on particular messages, such as nutrition, food ethos and shopping and budgeting advice.

Lastly, the courses were delivered at a group level with limited opportunity for the facilitator to tailor to individual needs, related to existing skills or interest for example. The limited flexibility of the course structure may therefore have reduced the likelihood of people from different target groups with different needs obtaining the maximum available benefits from the course.

2.4.2. Strengths and limitations

To our knowledge, this is the first study to conduct an in-depth analysis of a manualised cooking skills intervention, and to conduct observations of cooking skills interventions – in order to understand the basis by which it may effect changes in cooking skill behaviour – using the 40-item BCT taxonomy, which was developed by health psychologists based on extensive reviews of the descriptions of effective interventions.^{19 57} This particular taxonomy was chosen as it was specifically developed for dietary interventions, therefore has greater specificity for the purposes of this work. In contrast, the more recent 93-item version aims to develop a consensus for grouping distinct BCTs that is useful across all behavioural domains, for example diet, physical activity, smoking and sexual health.

Whilst a similar evaluation of the JOMoF intervention in Australia attempted to determine the overarching theoretical basis of the intervention, they did not perform systematic observations of sessions to explore the more specific ways in which behaviour may be changed. The Australian evaluation proposed that the JOMoF intervention is underpinned by Social Cognitive Theory and Experiential Learning, a conclusion that we arrived at independently here.⁵⁶ In coding the BCTs, we used the input of two independent researchers, with the aid of a third, experienced coder, to minimise the risk of bias.

The course manual gives details of all elements of potential curriculum topics and outlines its contents. However, we have determined that it is not, as expected, a prescriptive document that provides minutiae on exactly how each class should be run. It could therefore be argued that as the manual provides such a large amount of information, and possible topic areas, that it would not be realistic to expect all of the elements of the course structure to be covered in each session. Additionally, the manual is not a 'live' document, in the sense that it is not continually updated to reflect changes in the course content. Rather, much of the day-to-day dissemination of changes or updates to the material are carried out by the JOMoF team at JOFF, and therefore some of the things discussed in the manual may no longer be emphasised or messages may have been changed or adapted. However, it has been argued that complex public health interventions, such as this, do not necessarily need to be exactly and fastidiously replicated between intervention locations.²⁶ The more important aspect of such an intervention may be consistency of the 'active ingredients', with scope to adjust ancillary components according to organisational and contextual factors.¹⁰⁰

We conducted in-person observations of cooking skills classes that were available to the general public. The observations were facilitated by a bespoke observation form that was iteratively developed and refined for this evaluation, with input from a Health Psychologist and a researcher with experience of conducting assessments of implementation fidelity. However, because of the 'open' nature of the observation forms – necessary to capture the different styles and messages given by the different centres – and the typical fast pace of the classes, capturing all of the relevant information was difficult at times, especially during more lively, interactive classes. It is therefore possible that some things said by the instructors or volunteers, particularly if as an aside or as a one-to-one comment, may have been missed as part of the observation process.

The observations were conducted discreetly so as not to interfere with the class; however the presence of a researcher may have influenced the instructor's or participants' behaviour. Thus, we may not have observed a typical cooking skills class. Instructors may have found the presence of a researcher with a clipboard off-putting, or they may have felt the need to incorporate more nutritional, or other, information that they would not normally include. Possibly a more discreet way to conduct observations would be to video record them, but this would then require individual consent from all participants in the class, something which could prove quite difficult to achieve in practice, especially if not all of the class members have been recruited as participants in a trial. Alternatively, audio recording could be considered as a less intrusive, more economical method that may be less likely to influence the behaviour of facilitators.¹⁰⁰ However, such a method would not be able to interpret non-verbal cues relating to participant engagement, nor would it permit an assessment of the delivery of demonstrations of specific cooking skills.

The sample of sessions that were observed provided us with a good spread across sites, instructors, class topics, time of day and season. However, the number of observations that we conducted – 12 sessions were observed in total – was only a small number and may not have given us a representative insight into all of the different nuances of the course dependent on the site and instructor. For example, an evaluation of implementation fidelity of school-based drug education observed 320 classes.¹⁰¹ Because of this small sample, there remains the possibility that the variability that we captured was unusual, and that further observations would have resulted in us

seeing greater consistency between and within centres. However, as this research aimed to explore the feasibility of a definitive trial, full fidelity of the intervention need not be established. Rather, an indication of whether the intervention is likely to be effective is what is required at this stage, as well as identification of what the 'active ingredients' of the intervention may be, and data to inform a rigorous process evaluation as part of a definitive trial.

2.4.3. Interpretations and implications

Theoretical basis

In this intervention, behaviour may be influenced via the use of recognised BCTs. Also, giving participants the opportunity to practice cooking skills in a supported, social environment, may enhance the likelihood that they successfully learn these new skills.⁹⁴ Nonetheless, some classes and sites afforded more time for participants to practice these techniques, meaning that there may be greater opportunity at some sites for participants to be able to master the skills being taught. This theoretical basis, and the theorised pathway to behaviour change, is explored later in this section with the use of a draft logic model. A review of the use of BCTs in interventions targeting diet and physical activity found that out of 101 interventions, an average of 6 BCTs were present in the intervention descriptions.⁹⁶ Our study found that typically around 6 BCTs were being used across sessions that were observed, thus the intervention compares favourably to other, similar interventions, despite not being developed by public health interventionists.

There is also evidence that specific behaviour change techniques may be superior to others in interventions of this type, including the use of self-monitoring of behaviour when coupled with other techniques, and the combined use of action planning and coping planning.^{96 102} We have, therefore, proposed some additional BCTs that the intervention could incorporate, and we will also make suggestions to JOMoF concerning better structuring and incorporation of BCTs, which may enhance the intervention's ability to result in behaviour change.

During the observations, we also noted the teaching style and levels of engagement between instructors and participants, to understand whether there were crucial differences between instructors, and whether the teaching styles used were likely to be appropriate for the audience and thus likely to be effective in transmitting key messages. Overall, the class style was generally interactive, comprising short segments of demonstration and instruction, followed by participants attempting to practice the cooking skill or technique for themselves. The teaching style varied more, with some instructors being more didactic in their approach, and others being more interactive and discursive, although we did not judge any instructor's technique or teaching style to be excessively interactive or didactic, or wholly inappropriate for the aims of the course and the audience.

It is suggested that adults learn differently compared with children and adolescents, with no single style of teaching appropriate.¹⁰³ For example, some adults may prefer abstract, didactic approaches, while others will prefer the use of concrete experience. The current intervention makes use of both styles of teaching, meaning that it is likely to appeal to many different types of learners. It is also suggested that adult learners should be active, seek to use repetition when learning, and taught to generalise their skills to other settings, all of which were observed in the present intervention to some extent.¹⁰⁴

Fidelity

By comparing the manual to observations of intervention classes, and comparing between observations, we have explored the differences and similarities between and within centres, which answers the final research question of this work package. The outcomes of these exercises have showed that the core element of the intervention, both stated and observed, is the provision of instruction on how to perform basic cooking techniques, coupled with practical demonstration of these. Beyond this core element, the other aspects of nutrition, ethos, food safety, and shopping and budgeting advice, vary considerably between centres, and even within centres. However, the need to precisely standardise all elements of a complex intervention, such as this, has been questioned.²⁶ Rather, it has been suggested that it is the key elements of the intervention that are likely to lead to behaviour change that are most important in terms of fidelity. Therefore, by identifying these key components and ensuring that these are used, regardless of where and by whom the intervention is delivered, is likely to be of greater importance to the potential effectiveness of the intervention than ensuring that the intervention is delivered in a rigid and formulaic way.^{25 26} Once these key components related to behaviour change have been identified, it is possible to take certain steps to increase the likelihood of high fidelity of an intervention, such as detailed manualisation of an intervention, effective training of intervention deliverers, and regular monitoring.²⁵⁻²⁷ Some possible changes that could be made to the current intervention to improve its effectiveness are discussed later on in this section.

Another aspect of fidelity that may also be useful to explore in a definitive trial would be to what extent the course delivers accurate information about cooking skills, nutrition, hygiene ethos and shopping. Analysis of the manual and observations revealed that some information which instructors provided was not necessarily based in evidence, or was factually incorrect. Whilst these incidences of misinformation were deemed to be minor, and may well have been accidental or used by instructors to reinforce or simplify a particular message, these messages may serve to confuse participants, dilute genuine messages, or undermine participants' views of the instructor as knowledgeable in their area of expertise.

These exercises have provided us with the knowledge needed to develop a process evaluation that would complement a definitive trial. Such a process evaluation should seek to use the MRC's recently published framework to guide its development and implementation.²² Using the MRC's model, the observations, manual analysis and pilot study have already given an indication of the intervention's contextual factors and potential causal mechanisms, and we have deduced a description of the intervention. A definitive trial would allow fidelity to be fully established, and provide further data on the dose and reach of the intervention and its mechanisms of impact.²² Prior to measuring fidelity in a definitive trial, it would be critical to have formulated a definition of what fidelity is in the context of the intervention. The stated aim of the course is to give its participants basic cooking skills, in addition to advice on nutrition, hygiene and shopping, and in doing so, improve the diets and health of the participant and their families, increase social connectedness, and empower people to make the right food choices in their day-to-day lives. However, from our observations, we have established that the key element of the course is to impart cooking skills, with the other aims secondary to this. Therefore, it may be beneficial for a definitive trial, and indeed for JOMoF, to consider revision of their aims to make this their primary aim, as evidence suggests that interventions with a single target

behaviour may have better effects on outcomes.¹⁰⁵ Therefore, an evaluation of fidelity in a definitive trial may focus on this one aim, and the specific ways in which the behaviour is being targeted.

Recommendations for a definitive trial

In order to measure fidelity, we propose that the observation form that was piloted in this study should be adapted for use in a definitive trial, through discussion with JOMoF to refine the aims of the course and agree which elements of the course are central to these aims. An observation form for use in a definitive trial would be more focused, using more closed questions to capture prioritised key items of information, rather than attempting to capture a wide range of information. These key items would be those that we hypothesise to be the ‘active ingredients’ of the intervention based on our observations conducted as part of this research.

A definitive trial would also need the observation forms to be revised once the aims of the course and definitions of fidelity had been agreed upon. For a process evaluation embedded in a definitive trial, it is envisaged that the observation form will be revised by refinement of the key aspects of the intervention that are judged to be critical to its success in achieving behaviour change – the ‘active ingredients’. By hypothesising as to what these ‘active ingredients’ are, more closed questions will be incorporated into the observation form, replacing the open, free-text data capture boxes, thus making it easier for the researcher conducting the observations. A process evaluation would also be supported by qualitative interviews with participants and trainers.

Recommendations for improvements to the intervention

Based on our observations and analysis of the course manual, discussions within the project team and the existing evidence base, we have made recommendations for improvements that could be made to the intervention to improve its effectiveness.

Course manual

As the current course manual provides a wealth of information for instructors to use, it serves more as a reference tool than intervention description. We recommend that JOMoF conduct a review of the course manual in order to streamline its content, focusing on providing the core messages, and highlighting and formalising the use of BCTs.

Behaviour Change Techniques

We have recommended where additional BCTs could be incorporated into the intervention that would potentially improve its effectiveness. These recommendations have been made based on discussion within the project team, which includes an experienced health psychologist, and are based on existing evidence of techniques that have been shown to be particularly effective in similar interventions. These additional BCTs, which could be incorporated into the course, with minimal disruption to the overall class structure, are:

- Incorporating personal action planning at the end of each session
- Identifying barriers to cooking at home
- Explaining how participants can use coping planning to overcome barriers

These techniques have been shown to enhance the effectiveness of behaviour change interventions, particularly when used in combination.^{102 106}

We also recommend that the use of BCTs should be formalised and standardised within the class structure and within JOMoF's training that it provides to course trainers, as at present there is no explicit use of BCTs by instructors, and they are not explicitly discussed during training. JOMoF could, therefore, seek to incorporate these more explicitly, so instructors can be aware of the techniques, the benefits of using them, and how to use them in the context of each class. To facilitate this, JOMoF's trainers could seek training on the use of BCTs from a trained health psychologist. Use of the recommended BCTs in the course would be classified as a 'low intensity intervention' as specified in the health behaviour change competency framework, which details the competency domains that a person delivering a low intensity intervention would need.¹⁰⁷

Nutrition messages

The nutrition messages that are provided should be pared down and refined, so that only simple, key messages are provided that are appropriate to the level of a basic cooking skills course. Messages could be strategically aligned with certain classes to make them more salient, for example discussing saturated fat in the meat class, and sugar in the baking class. Instructors could focus on these key messages, using simple, practical examples, and avoiding overly scientific or complex information. The use of relevant concrete examples, delivered with clarity, are known to be useful in the context of adult learning. Instructors should err on the side of less content rather than attempting to teach too many things.^{103 108} For example, instructors could talk about alternatives for butter as a frying medium, and then ask participants to recap what kinds of oil they should try and use for frying foods. Instructors could also check participants' understanding and retention of information and provide reinforcement by asking questions during the class. Further reinforcement can be achieved by repeating such questions at the start of the following class.¹⁰³

Instructors should also be aware of how some messages may cause confusion, by provision of conflicting information or not fully quantifying amounts. For example, if oil is used to fry rather than butter, then that should be used consistently rather than switching between butter and oil, or at least a clear message given about when one might be more appropriate than the other. Or, if instructors are teaching participants how to season food, a measured amount of salt should be added, and this should be used consistently. These steps should help key nutrition messages to be better assimilated by participants.

2.5. Conclusion

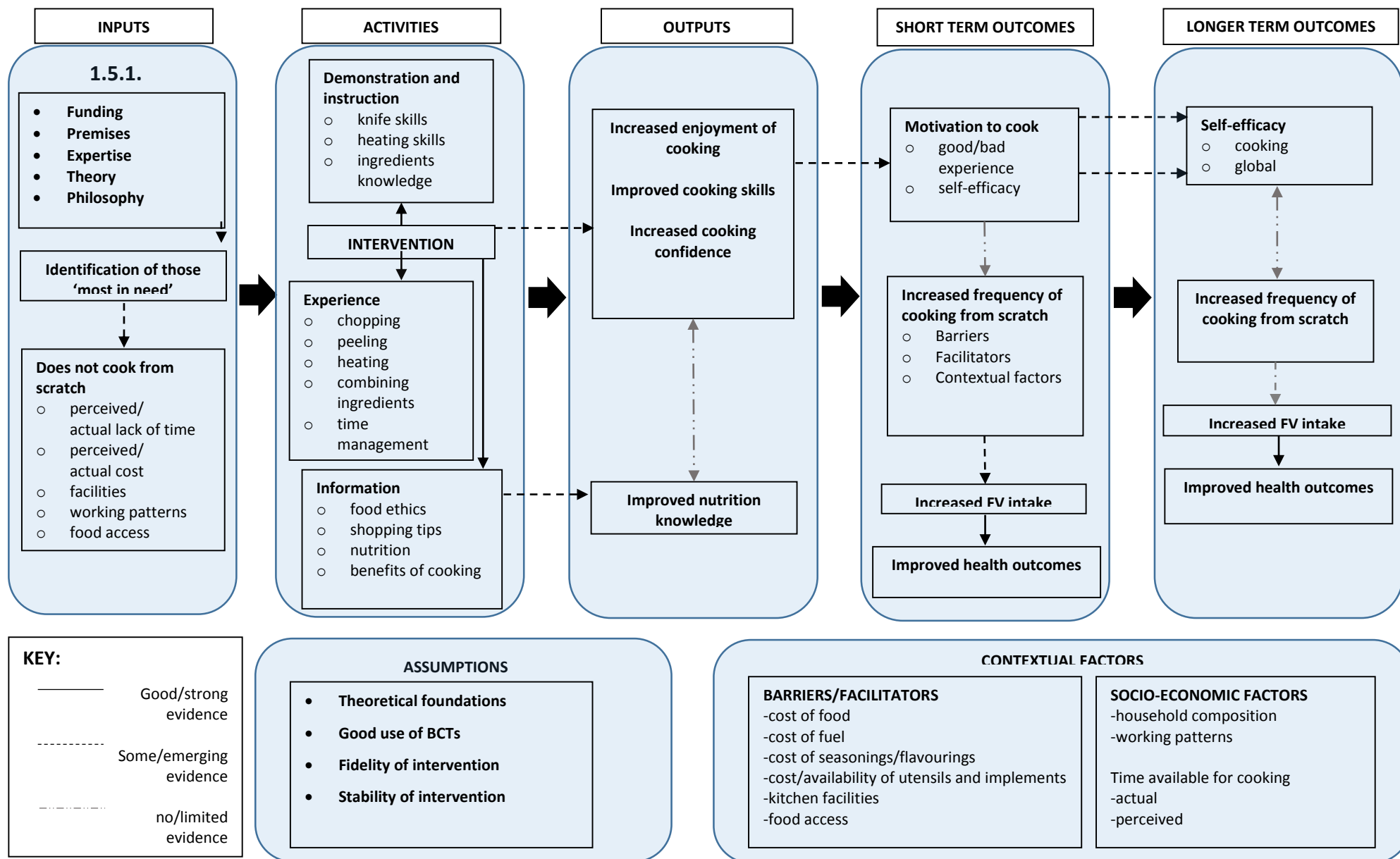
Overall, we observed that the intervention shows promise as an intervention that can be evaluated and has the potential to be effective at improving cooking skills. Although some differences between and within centres were observed, we have not deemed these to be so great as to threaten the evaluation potential of the intervention as part of a definitive trial. However, we do believe that some changes to the intervention may increase the potential of its effectiveness, such as standardisation of BCTs, incorporation of additional BCTs, streamlining of nutrition messages and refinement of the course's aims and training.

Prior to commencing a definitive trial, further work would need to be undertaken, in partnership with JOMoF, to revise the manual and agree on the 'active ingredients' of the intervention. Following this, a training plan would need to be implemented by JOMoF so that any changes can be

communicated to course trainers. Support from a Health Psychologist with this work would be of benefit.

Analysis and observation of the intervention has enabled us to theorise the intervention and its potential impacts. We have documented our thinking to date in a draft logic model (Figure 6), which will inform the design of a definitive trial.

Figure 6: Draft logic model for JOMoF Cooking Skills Intervention



3. Work Package 3 – pilot RCT

3.1. Background

To date there have been no rigorous trials of cooking skills interventions in general adult populations, with previous studies beset by a range of methodological challenges.⁵⁹ The purpose of this pilot study was to test proposed methods for a definitive randomised controlled trial (RCT) to ensure that they are feasible, practical and fit for purpose, to determine the sample size needed for a definitive trial, and to refine the outcome measures to be used in a definitive trial.

The MRC's guidance for evaluating complex interventions recommends that randomised designs should be used where practicable.¹⁰⁹ Randomised designs provide more robust outcome data, by minimising confounding, and evenly distributing characteristics of participants that may influence the outcomes. For these reasons, we wished to pilot a design that used randomisation to either an intervention or a control group, in order to assess the practicality and acceptability of this from a participant's perspective. We chose a wait list design because it was anticipated that at least some of our participants would already have made a decision to attend a JOMoF cooking skills course.

In a definitive trial, the collection of dietary data will enable us to establish whether participation in a cooking skills intervention leads to a sustained change in diet of public health or clinical significance (measured at 12 months' post intervention). A clinically significant change in diet was defined as a statistically significant increase of at least a half a portion (40g) of fruit and vegetables per day. This magnitude of increase has been demonstrated to reduce the incidence of many cancers.^{110 111} A change in diet of public health significance might be smaller than this, but we felt that without evidence that this intervention could be scalable for population impact, clinical significance should drive the study design.

3.2. Aims and objectives

For the pilot study, we aimed to recruit 96 participants: 48 to be allocated to the intervention arm, and 48 to be allocated to the wait-list control arm. These participants were recruited via two routes: directly from the community (community participants); and from the existing wait-lists (wait-list participants) at the six sites of the JOMoF cooking skills intervention. Follow-up data were collected at 4-weeks post-intervention; in a definitive trial the follow-up period would most likely be 12-months. Rather than aiming to detect whether any intervention effects begin to decay after this time, the primary purpose of the 4-week follow up was to give an indication of likely participant loss to follow up.

The primary outcome measure for the pilot study was to assess whether a definitive trial would be feasible using the same or similar methods of data collection and study procedures, assessing factors affecting recruitment, retention and attrition, as well as practical and methodological issues that are likely to affect the success of a definitive RCT, such as non-compliance with data collection methods.

In order to make a decision about the feasibility of a definitive trial based on the results of the pilot trial, rates of the following were assessed:

- i) *recruitment*, reported as a proportion of those interested in taking part (as identified from notes taken at recruitment events) who actually signed up to take part in the study
- ii) *attrition*, reported as the % of participants who do not provide follow-up data
- iii) *compliance*, reported as a proportion of the total number of participants who accept their randomisation allocation

- iv) *attendance*, reported as the average number of intervention sessions attended by intervention arm participants.
- v) *extent of missing data*, reported as the average number of missing days of dietary data and average proportion of missed questionnaire responses.

There was no *a priori* definition of what would constitute a ‘feasible’ rate of each of the above because of the lack of precedent for an RCT of a cooking skills intervention – each rate will be assessed separately and discussed amongst the project team, with reference to rates for similar studies, to make a decision about whether such a rate would be acceptable for a definitive trial.

Overall, the pilot study aimed to address the following research questions:

- 8. *What are the baseline self-reported cooking skills, diet and socio-demographic characteristics of participants of a cooking skills intervention?*
- 9. *How do the baseline self-reported cooking skills, diet and socio-demographic characteristics of wait-list recruits compare to community recruits?*
- 10. *Do the socio-demographic characteristics of community wait-list recruits align with those identified as most in need of cooking skills interventions from research questions 1-4?*

The pilot study also aimed to answer, in part, the following research questions. The answers to these questions are based around the collection of both quantitative and qualitative data; the quantitative results are addressed here and the qualitative results are addressed in chapter 4.

- 13. How practical and acceptable are the research methods proposed for a definitive RCT of a multi-site cooking skills intervention, for both UK adult participants as well as those involved in commissioning and delivery?
- 14. What factors may affect non-recruitment, attrition, attendance and compliance with data collection methods?

3.3. Methods

In the current JOMoF model, some participants are self-selecting volunteers, whilst others attend a course commissioned by external agencies. Courses commissioned by external agencies are more likely to target specific groups, identified as in need of cooking skills, such as widowed men. While volunteers are likely to be enthusiastic and committed, they may not necessarily be those most in need. We determined those ‘most in need’ using the results of WP1, which found that, in general, men and those from lower socio-economic groups were more likely to report poorer confidence at using specific skills and at cooking ‘from scratch’. Therefore, for the pilot trial, we recruited participants via two routes:

- directly from the community, identified as most in need using the results of WP1; these participants will be referred to as ‘community participants’
- from the existing wait-lists of the JOMoF cooking skills intervention sites; these participants will be referred to as ‘wait-list participants’.

Initially, it was planned that participants at three sites would be recruited from the community, and participants at the remaining three sites would be recruited from existing waiting lists. The determination of which sites will be allocated to which recruitment method was pragmatic, based

upon whether the wait list structure would accommodate recruitment of participants, and the guidance of JOMoF.

Changes to recruitment schedule

Initially, the plan for this research was to engage and work with all six of the extant Ministry of Food centres that were operational at the time of planning. However, whilst we did work with, and recruit participants from the localities of four of the centres, two of the centres (Rotherham and Alnwick) closed during the data collection stage thus resulting in changes to our recruitment and data collection plans. The centre at Alnwick, anomalous in terms of its location and target market, closed down shortly before recruitment was due to commence there. This closure was not entirely unexpected, as some indication of the non-viability of the site had been given prior to commencing. Secondly, also shortly before recruitment was due to commence, the JOMoF centre in Rotherham was unexpectedly closed due to health and safety concerns. This closure was temporary, and the rectification of these problems and the centre's reopening were initially planned to take place soon after its closure. Unfortunately this was delayed, resulting in it not being feasible for us to recruit participants and collect follow-up data within the timescales of the study. The Rotherham centre has now reopened.

The centre in East London withdrew from its partnership with JOFF shortly before the control arm were due to begin the cooking skills course. This meant that the observations could no longer go ahead as planned at this site, and participants in this arm were no longer able to take part in the cooking skills course; this did not impact upon the data that needed to be collected for this research.

Inclusion and exclusions criteria

To be included, participants had to be 18 years or more, living in the community, speak English fluently, self-identify as having the potential to benefit from a basic level cooking skills class, and able to commit to eight weekly sessions of 90 minutes. Participants younger than 18 years, unable to speak English fluently or living in an institution were excluded, as were those who could not commit to the eight week intervention course. Participants were also expected to accept randomisation to either the intervention or control condition. The control condition involved waiting for approximately 16 weeks to join a cooking skills course.

3.3.1. Recruitment

Community participants

It was proposed that a robust method, replicable in the definitive RCT, be developed to identify eligible participants in the community. To do this, we developed and piloted recruitment methods to target those most in need. Results from WP1 suggested that the recruitment strategy should be developed to target males and people from more deprived communities. The recruitment strategy at each of the sites is detailed below:

Leeds, West Yorkshire (16 participants) – We worked with Zest Health for Life, the host organisation for JOMoF, to approach and recruit women in inner-city, deprived areas immediately to the east of central Leeds. With the support of a community development worker, we attended an after-school 'tea' club to approach mothers with children at the school. At this club were around 6-7 mothers with their children, which provided a relaxed and informal environment in which to talk about the study and for people to ask questions. Similarly, we also attended a coffee-morning at a different school nearby, also run by the

same community development worker; this group also had around 6-7 mothers. We attended these events on three consecutive weeks, in order build trust and give people a chance to reflect before committing (conveniently, some of the dietary interviews were conducted at the same time). These two approaches resulted in 6 sign-ups.

In addition to this, the community development worker also publicised the study via a text message sent to all parents on their mailing list, which resulted in 2 people signing up. Another 4 people heard about the study at a parenting course that they were attending, also run by Zest Health for Life, while another 2 were told about the study via another community development worker (also from Zest Health for Life) in north Leeds. The final 2 participants heard about the study via a Facebook post by JOMoF. In summary, recruitment in Leeds was primarily facilitated by working with community groups, supported by a local health and wellbeing charity and their community development workers, and use of social media.

Newcastle upon Tyne, Tyne and Wear (16 participants) – In Newcastle, we focused on recruiting male participants through workplaces. The first recruitment event was arranged to take place in the drivers' break area of a large, local bus company. Based on feedback that we received at our first advisory group meeting, these recruitment events were hosted in partnership with JOMoF, who brought a branded stand and provided free samples of food that we used to engage people. There was a lot of interest at this first event. However, only 2 participants actually signed up, as the remainder changed their mind or could not be contacted after the event. We then hosted a second event at the same company's other depot in the city. Although based in a quieter part of the depot, this event saw 3 people sign up to the study.

The remainder of the recruitment (11 people) in Newcastle was achieved through two similar recruitment events hosted within the control centre of the Tyne and Wear Metro – the event was held in a break area used mainly by train drivers. For this event, we were supported by the local 'health in the workplace' coordinator, who publicised the event to staff beforehand which helped a great deal in canvassing interest in the study.

Stratford, London (17 participants) – In Stratford, we primarily had to rely on JOMoF's existing links into the community because of the distance from Newcastle, leading to inherent difficulties in arranging events there ourselves. The first event was hosted at West Ham Football Club's community sports facility in Beckton, Newham, and was attended mainly by young adults who were using the facility to train and play football. For the event, JOMoF provided a live cooking demonstration, followed by a brief talk from a researcher about the research which resulted in 9 people signing up. Another similar event was hosted at a community support group for older Asian men, but this resulted in only 1 participant signing up, as most of the group did not wish to be randomised individually, and did not want to travel to the JOMoF venue (~2 miles away).

The remainder of the participants (7 people) in Stratford were recruited via two live cooking demonstrations that were hosted at the JOMoF kitchen, which was located in the busy foyer of East Ham Leisure Centre and so naturally had a large amount of 'passing trade'.

Bradford, West Yorkshire (23 participants) – In Bradford, we used a mixture of workplace and community recruitment approaches, using JOMoF's links within the city council and new community links that we established specifically for recruitment. For the workplace recruitment, we adopted a similar approach to the recruitment events in Newcastle, working with JOMoF to provide a branded recruitment stand and free samples of food. Two events were held in the reception of a large council office-block in the city centre, and a further event in the city hall. These three events resulted in 11 people signing up, some of whom had seen publicity for the event beforehand that had been posted on the council's intranet page.

The remaining 12 participants were all recruited via a community support group for older men – most of the men at the group were widowers, had some mental health issues or were socially isolated. We were strongly supported by the group's project manager, who believed that a cooking skills course would be of great benefit to many of the men attending. In order to recruit these men, we attended the group's weekly coffee morning and gave a brief presentation about the study. As in Leeds, we also returned the following two weeks, both to collect data but also to recruit additional people who decided that they wanted to take part. Again, this recurring presence of a researcher seemed to encourage some more reticent individuals who would not have had the confidence to sign up at the first event.

Individuals from the community who were interested in participating were informally screened for eligibility. This was done by explaining to the potential participant that we were looking to recruit people who want to gain or improve their basic cooking skills, and as the course aims to teach basic skills, that the participant would be unlikely to benefit if they already perceived their skills to be adequate. The onus was on the participant to decide if they would benefit from taking part, having been given the details of what the course would entail.

If a participant decided that they would like to participate, the researcher gave the individual an information sheet, which the participant could take away and read. Some participants, particularly in workplaces, would then return to the researcher and ask to sign up; others were followed up by telephone call a few days later to ask if they would still like to take part.

Wait list participants

Participants on waiting lists for JOMoF courses at all participating centres that fitted with the recruitment schedule were sent letters on our behalf by the local JOMoF centre to which they had signed up. The letter enclosed an information sheet to introduce the research, and asked them if they would be willing to participate. The reason for using JOMoF as an intermediary was to avoid JOMoF having to reveal their participant's personal data to us, which would be in breach of the Data Protection Act (1998). A reply form and prepaid return envelope allowed those on the wait list to reply directly to the research team, giving their contact details. Alternatively, these individuals could telephone the research team directly if they wished. If individuals responded via reply form, we then contacted respondents by telephone to confirm their willingness to participate, explain the research further and arrange a home visit.

If participants did not agree to participate after reading the information leaflet and considering what the study would require of them, we asked them to return a slip indicating their reasons, by free text, for deciding not to participate; very few participants did this.

Procedures for data collection were explained when participants were recruited, either at a recruitment event or a subsequent home visit.

3.3.2. Sample size and randomisation

For the pilot study, we aimed to recruit a total of 96 participants. This sample size was chosen as it was deemed feasible within both the recruitment timescale and the overall timescale for the study. The target recruitment figure of 96 was chosen (16 per site) in order to allow for an expected attrition rate of approximately 30%. This would have resulted in full data from 34 people per arm, which is slightly greater than the recommended 30 people with full data per arm of a pilot study.¹¹²

Upon recruitment, participants were allocated to one of two dietary data collection methods: three day food diaries or three x 24-h recalls. To achieve this, all unique study identifiers were generated prior to commencement of recruitment, and randomly allocated to one of the two dietary data collection methods, so that as participants were recruited, they were automatically allocated to one method. Upon completion of baseline data collection, community participants and wait-list participants were randomised, on a 1:1 basis using a computer-based variable block size allocation method stratified by site (independently prepared in advance by our study statistician (DS)), to either take part in the next available cooking skills intervention course at their chosen site – the intervention arm – or to wait approximately 16-20 weeks to begin a cooking skills intervention course at their chosen site – the control arm. Intervention arm participants were either distributed among existing classes according to date/time preferences of the individual, or took part in a block-booked course set up solely for intervention participants, dependent on the JOMoF site.

3.3.3. Outcome measures

The outcome of the pilot study was to establish whether a definitive trial would be possible using the same or similar methods, both in terms of recruitment and retention, and also in terms of data collection methods. Part of this assessment was based around the collection of data which would inform the primary outcome (dietary change) in any such definitive trial, collection of questionnaire data around cooking skills and other health-related knowledge and behaviours, and collection of information around costs to participants.

Primary outcome measures

Feasibility was assessed by establishing rates of: i) recruitment; ii) attrition; iii) compliance; iv) attendance; and v) extent of missing data (See section 0 for definitions).

Secondary outcome measures

We used either three-day food diaries or three x 24-h multiple pass recalls to gather data on the habitual diet of a cooking skills intervention participant before, and four weeks after, participating in a cooking skills intervention.

A questionnaire was developed using a mixture of adapted existing instruments and newly constructed questions, to investigate self-reported cooking skills and cooking confidence, healthy eating knowledge, attitudes to healthy eating, barriers and facilitators to cooking ‘from scratch’, self-esteem and self-efficacy, and motivations for taking part in a cooking skills intervention (see Table F in the appendix for details of question instruments and sources; a full copy of the questionnaire is available upon request from the research team). Given the complex nature of cooking and cooking

skills, proxy measures were used. These were taken from existing instruments, assessing confidence in using eight cooking techniques, ability to prepare four types of dish (both questions taken from NDNS), and confidence at being able to cook from basic ingredients, following a simple recipe, preparing and cooking new foods and recipes, that what is cooked will 'turn out' well, and at tasting foods not eaten before; these last questions were taken from a validated cooking skills questionnaire.⁸⁶

These variables were measured in cooking skills intervention participants, before and after taking part in the JOMoF cooking skills intervention. The questionnaire was also used to record socio-demographic data in the form of age, sex, ethnic origin and age at leaving full-time education.

3.3.4. Intervention & control condition

Intervention

Following randomisation, participants who had been allocated to the 'intervention' group were offered a place on an eight-week, eight-session cooking skills course, at no expense to themselves. Follow-up measures were collected approximately 4 weeks after completion of the cooking skills course. We used class registers to ascertain the level of participant attendance.

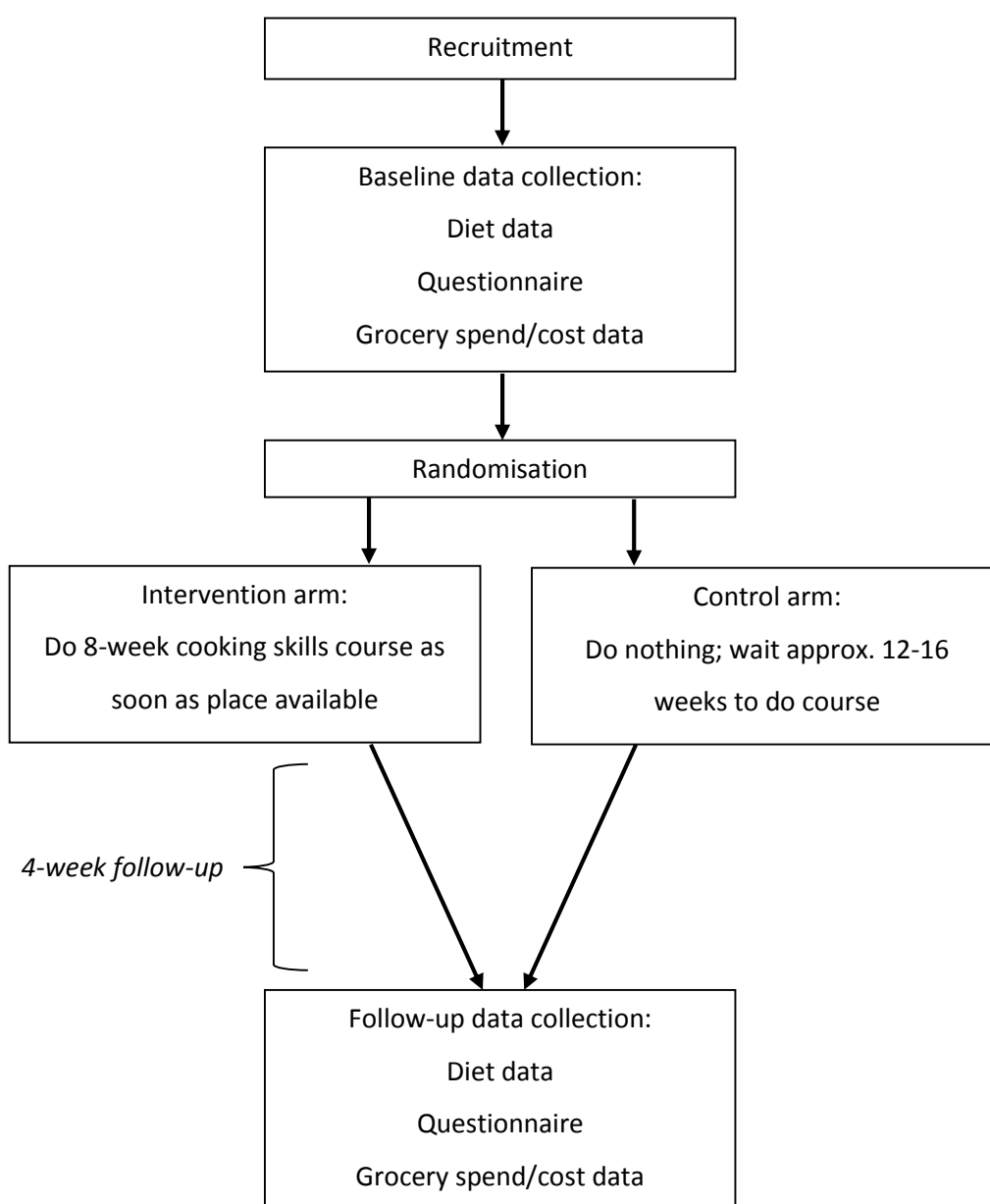
Control condition

This group were offered the intervention once all follow-up measures had been collected (i.e. approximately 16 weeks after randomisation), but were not prevented from voluntarily seeking cooking skills tuition during the trial. We asked this group whether they had sought cooking skills training independently during the follow-up period.

3.3.5. Data collection points

All participants provided dietary data and completed a questionnaire prior to randomisation. Participants randomised to the intervention arm then provided dietary data and completed a questionnaire again approximately four weeks after the last cooking skills intervention course session. Participants in the control arm provided dietary data and completed a questionnaire at the same time as participants in the intervention arm. All participants, in addition to receiving the cooking skills course at no expense to themselves, also received two £20 shopping vouchers; one to thank them for providing dietary data and completing questionnaires at baseline, and another for completion of the same at follow up. Figure 7 **Error! Reference source not found.** shows details of participant flow and data collection points.

Figure 7: Diagram of participant flow through pilot study, and data collection at each time point



3.3.6. Data collection methods

Three day food diaries

Participants were given the baseline three day food diary, along with written instructions for how to complete it, after providing informed consent. They were asked to complete the food diary over a period of three consecutive days, with one of the days being a weekend day. For completion of the second food diary, the participant was asked, if possible, to record the same three days of the week that were recorded for the first food diary.

The participant was encouraged to keep the diary with them at all times on the days that they are recording, and to consume their normal diet over the recording period, using the food diary to record detailed information about all food and drinks consumed, as well as leftovers.

Upon completion of the food diary, a researcher met again with the participant to conduct an interview. The purpose of the interview was to scrutinise the food diary in order to clarify ambiguous items and portion sizes, and check that all food and drink consumed has been recorded.

24-hour multiple pass recalls

Participants were interviewed, either by telephone or in person, to gather information about the foods and drinks that they consumed on the day prior to the interview. The first two 24-hour recall interviews will be conducted by telephone, and the third and final one conducted in person. To allow comparison with three day food diaries, two 24h recall interviews were conducted on a weekday, and one conducted on a weekend day. Initially, it was planned that the dates of the two telephone interviews would be generated in the Microsoft Access study database, but in practice these often took place on days and times that were convenient for the participants.

If there were difficulties contacting a participant by telephone, the researcher attempted each recall on no more than six occasions, and not more than twice on one day. Researchers also sent text reminders to participants so that the participant was aware that the researcher was trying to contact them. If, after the sixth attempt, the participant still could not be contacted, the researcher omitted this recall interview. Follow-up dietary data was collected using another three 24-hour recall interviews. As at baseline, the first two 24-hour recalls were conducted over the telephone, and the final 24-hour recall conducted in person.

Participants were asked to consume their normal diet during the data collection period. The 24-hour recall interview used the multiple-pass method, which involves three stages of probing questions, permitting collection of detailed information about all foods and drinks consumed on the previous day.¹¹³ The three stages are: 1) quick list; 2) detailed information; 3) final review.

Questionnaire

Participants were asked to complete the questionnaire, in private, before the second meeting with the researcher. On collection, the researcher checked that all questions had been answered, asking the participant to complete any missing responses (if omitted by mistake).

In order to overcome any literacy barriers that some participants may face in attempting to complete the questionnaires, all participants were given the option for the questionnaire to be administered in person by the researcher.

3.3.7. Data entry

Dietary data

Individual food items from 3-day diaries and 24-hour recalls were coded into the most appropriate McCance and Widdowson¹¹⁴ food code for the item; this was done by a researcher experienced in using these food codes.

For composite foods prepared by the participant, where possible, each item was coded individually, even if a code for the 'whole' dish was available, except in the case of the participant not being able to recall the ingredients for the dish, for example when another member of the household had prepared it.

For composite dishes bought from a supermarket or other retailer where the ingredients list and nutritional information were available, either via the internet or from the packaging itself (if the participant has kept it), the researcher coded the meals' composite parts.

Where a breakdown was not available for a composite dish, for example foods obtained from a takeaway or restaurant, or if ingredients lists did not provide sufficient information, the researcher instead used an appropriate code for the whole dish in the database.

Most portion weights were ascertained during the dietary interview, but for some foods this may not have been possible. This could be because the food was not available in the food atlas or the food was purchased from a take-away or restaurant. In these cases the MAFF Food Portion Sizes booklet¹¹⁵ was considered in the first instance. This booklet provides a standard, larger than average or smaller than average portion size for most commonly consumed foods. The size of the portion used was guided by the participant's description of the food. If the food was not available in the MAFF Food Portion Sizes booklet then the website 'weightlossresources.co.uk' was searched to see if there is a standard portion weight available in its database of foods.

Questionnaire data

Individual questions, or sub-questions, were numerically coded into a database using a predetermined coding scheme. All questionnaires were double-coded and then checked for discrepancies.

To establish the socio-demographic characteristics of participants, we used the 2010 Index of Multiple Deprivation (IMD) rank, matched to participant's unit postcode, and age at leaving full-time education.¹¹⁶

Data processing & analysis

Dietary data and questionnaire data were linked and merged prior to analysis. Descriptive statistics were calculated for both dietary and questionnaire data using Stata v. 13.¹¹⁷ Data from the main study database (Microsoft Access 2013) were also used to calculate some process measures; these analyses were conducted using Microsoft Excel 2013.

Using data from the main study database, the following were calculated in Microsoft Excel:

- total number of attempts taken for each telephone recall
- total number of attempts taken for each visit
- time elapsed between recruitment and randomisation
- time elapsed between recruitment and start of course (for intervention arm participants)
- time elapsed between end of follow-up period and end of follow-up data collection
- total time spent in the pilot study

Using the dietary data, the following were calculated in Microsoft Excel:

- total food energy
- total fat, and % energy from fat and saturated fat
- total non-starch polysaccharide (fibre)
- total non-milk extrinsic sugars (free sugars)
- portions of fruits and vegetables consumed -

- one portion equalled 80g of fresh fruits or vegetables, or 30g of dried fruit. A one portion per day limit was applied to instances of fruit juice or consumption of any kind of beans.

Using the questionnaire data, the following were calculated in Microsoft Excel (a copy of the questionnaire is provided in the appendix with full labelling of questions):

- number of cooking techniques confidently using – this was calculated by summing the number of positive responses to the question “For each cooking technique, please tick yes if you are confident using this technique, or no if you are not confident using this technique”
- knowledge of healthy eating guidelines – this was calculated by summing the number of correct responses to questions 6.3, 6.4 and 6.5
- number of reported difficulties that participants may have when trying to eat healthier – this was calculated by summing the positive responses to all of the sub-parts of question 6.8
- nutrition self-efficacy score – this was calculated by summing the scores for each sub-part of question 6.13.

3.3.8. Qualitative study

The methods for the qualitative findings that are presented in this chapter can be found in section 0.

3.3.9. Data management

All dietary data and questionnaire data were entered into a secure database. Each participant was allocated a unique study identifier, which was used on food diaries/24-h multiple pass recalls and questionnaires, and on interview and focus group documentation, so that the identity of each participant remained confidential and all data remained anonymous. Participants’ personal information was stored on a separate password-protected file. Hard copies of completed food diaries/24-h multiple pass recalls and questionnaires are held in secure archive facilities at Newcastle University. Any data presented in reports, publications and presentations is fully anonymised; therefore, it will not be possible to identify individual participants from these outputs.

3.4. Results

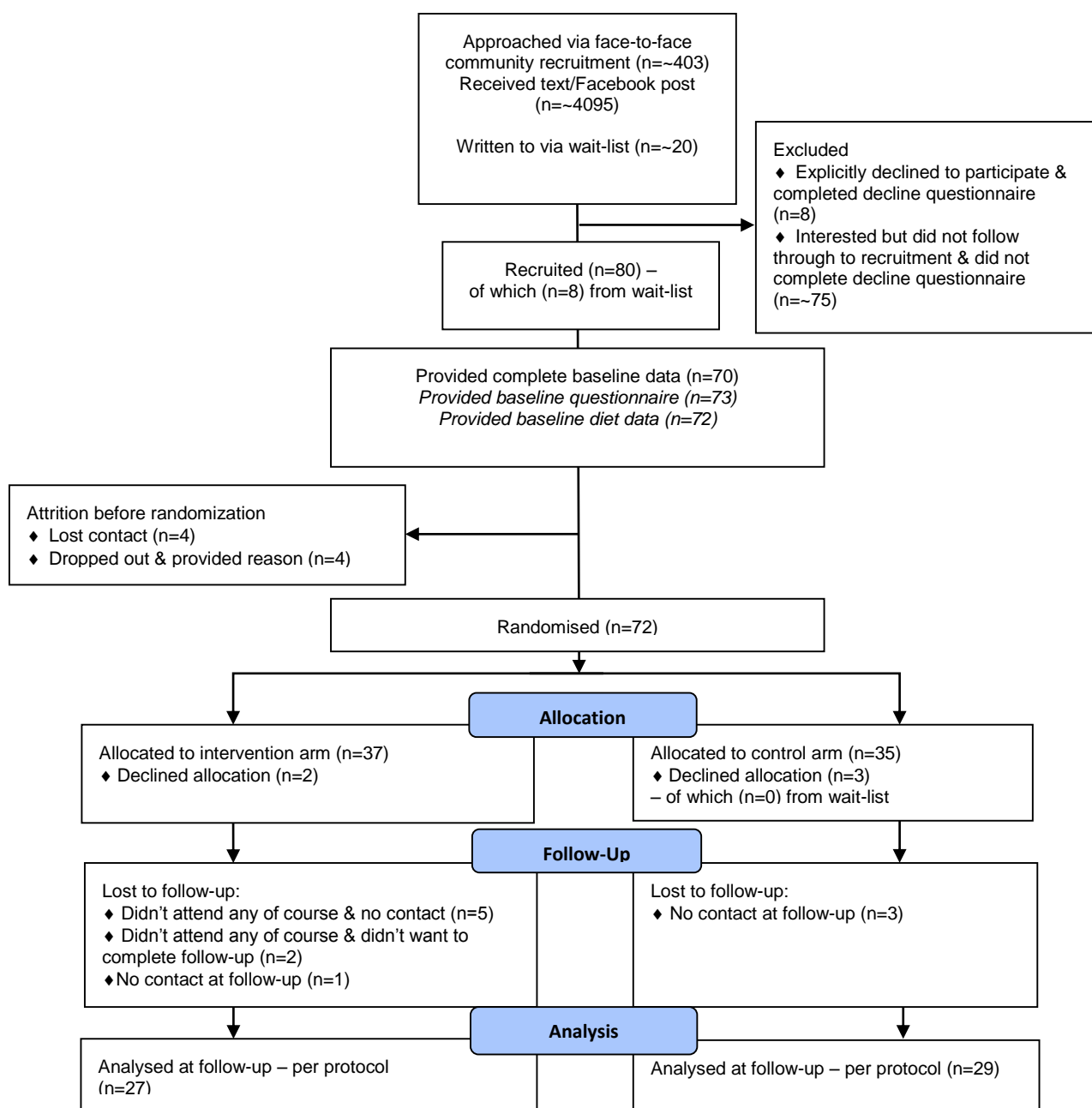
3.4.1. Primary outcomes - recruitment, retention and attrition

This first section will address the primary outcome, as well as quantitative data on the data collection processes and extent of missing data. This section answers the following research question:

13. How practical and acceptable are the research methods proposed for a definitive RCT of a multi-site cooking skills intervention, for both UK adult participants as well as those involved in commissioning and delivery?

Figure 8 is the CONSORT¹¹⁸ flow diagram for the pilot trial. The target for recruitment was 96 participants – 16 from each of the six sites – but this was not achieved due to the loss of two sites (as described above); the final number of participants recruited was 80.

Figure 8: CONSORT flow diagram for pilot study



A number of different approaches were trialled for community recruitment, based on the results of WP1, which identified that men in routine and semi-routine occupations were more likely to report poorer cooking skills. A recruitment strategy was devised that aimed to target recruitment at this demographic. However, because of the inconclusiveness of WP1's results, recruitment was not targeted exclusively at this group. The aim of the recruitment strategy was therefore for the sample to consist of around two-thirds males, with the remainder females, and with the majority of participants from low socio-economic backgrounds.

Pilot recruitment strategy

Table 13 shows the progress of recruitment during the pilot trial by centre. Recruitment took place over a 10-month period and was staggered by site. Initially, it was planned that recruitment would be

evenly split between two discrete methods: wait-list and community. However, it quickly became apparent that approaching people on the existing waiting lists for a cooking skills course was not likely to attract many participants. The reasons for this are threefold: firstly, based on the small amount of feedback received, people signed up to a course were generally not willing to accept a possible change of course commencement date, as had been anticipated at the design stage; secondly, sign-up to a cooking skills course was often done only shortly before the course commenced (by individuals rather than JOMoF), resulting in an insufficient lead time to allow us to recruit these people and collect their baseline data; lastly, the under-resourced JOMoF centres lacked the time and capacity to be able to forward introduction letters to all participants who were signing up to courses, meaning that many potential participants were probably not approached.

Wait-list recruitment was also piloted in Newcastle, to ensure that the lack of success in Bradford was not an anomaly, but waiting list recruitment in Newcastle was equally unsuccessful. Therefore, it was decided that waiting list recruitment would not be feasible for a definitive trial, and that the community recruitment approach should be expanded in order to meet the required number of participants for the pilot trial.

Two of the centres closed during the recruitment period, which resulted in changes to the original recruitment schedule. It was therefore decided to carry out additional community recruitment in Bradford to backfill these two centres. Only one replacement site was chosen because of the slight delays resulting from the previous closures, making it an unrealistic proposition to be able to recruit at two additional centres and remain within the study timescale.

Table 13: Numbers of participants recruited per month by site and recruitment strategy

	<i>Oct 2013</i>	<i>Nov 2013</i>	<i>Dec 2013</i>	<i>Jan 2014</i>	<i>Feb 2014</i>	<i>Mar 2014</i>	<i>Apr 2014</i>	<i>May 2014</i>	<i>Jun 2014</i>	<i>Jul 2014</i>	<i>Total by site</i>
Bradford (wait-list)	1	0	0	2	1	1	2	0	0	1	8
Leeds (community)	8	8	0	0	0	0	0	0	0	0	16
Newcastle (community)	0	0	2	3	0	0	11	0	0	0	16
Stratford (community)	0	0	0	12	5	0	0	0	0	0	17
Newcastle (wait-list)	0	0	0	0	0	0	0	0	0	0	0
Bradford (community)	0	0	0	0	0	0	0	0	18	5	23
Total by month	9	8	2	17	6	1	13	0	18	6	80

Rates of recruitment, randomisation and retention

Table 14 shows the rates of recruitment, randomisation and retention. Data is only presented here for those who were recruited via community recruitment. As discussed, wait-list recruitment is not likely to be feasible in a definitive trial and therefore numbers are not presented for this method.

The figures relating to the number of people who were approached are approximate, and based on notes taken at recruitment events and informal discussions with recruitment partners. However, these figures do not include the numbers for people who may have seen a small number of recruitment ‘advertisements’ that were published via social media. While the number of followers for the social media channels are high (e.g. Ministry of Food sites’ Facebook pages), we were unable to determine how many people would have seen and attended to the recruitment message.

The recruitment rate, based on the approximate number of people approached or who were in attendance at one of the recruitment events, was 17.9%. Of those who were recruited, 88.9% went on to be randomised. Those who were recruited but did not proceed to randomisation were either non-contactable following recruitment, or explicitly said that they could no longer participate. No participants said that they no longer wanted to participate because of study design issues, rather personal circumstances meant it was not possible for them to continue.

Table 14: Rates of recruitment, randomisation, retention and attendance for the community recruitment arm only – proportions and 95% CI. Based on in-person recruitment, excluding social media postings.

	<i>Number/denominator (rate(%)) [95% CIs]</i>
Recruitment rate as a % of the approximate number of people approached/aware of recruitment	72/403 (17.9) [14.3, 22.0]
Randomisation rate as a % of the total number recruited	64/72 (88.9) [79.3, 95.1]
Retention rate* as a % of the total number recruited and randomised	50/64 (78.1) [66.0, 87.5]
Retention rate* as a % of the total number recruited only	50/72 (69.4) [57.5, 79.8]

** - participants who were ‘retained’ are defined as: participants who were recruited, provided baseline data, accepted their allocated study arm, attended ≥50% of the intervention sessions (if intervention arm) and provided follow-up data.*

Table 15 provides socio-demographic details about the participants who rejected their allocated study arm – two participants in the intervention arm and three in the control arm. It was expected that a greater proportion of participants in the control arm would reject their allocated arm because of the wait to take part in a cooking skills course, but this did not seem to be evident. The table also presents free text comments from participants on reasons for not participating.

It had originally been anticipated that 65% of participants would be retained at follow-up. The final retention rate, based on all those recruited, was slightly higher at 69.4%. As a proportion of all participants who were recruited and proceeded to randomisation, 78.1% were retained. These rates of recruitment and retention will need to be taken into account in sample size calculations for a definitive trial.

Table 15: Number of people who dropped out, declined their study arm, or were lost to follow-up at different stages of the study, broken down by socio-demographic characteristics and study arm (for those who dropped out post-randomisation).

	<i>Declined allocation – Intervention arm</i>	<i>Declined allocation – Control arm</i>	<i>Didn't attend course – Intervention arm (only)</i>	<i>No contact for follow-up – both arms</i>
Total	2	3	7	4
Sex				
M	1	1	3	3
F	1	2	4	1
Age			#	
Mean (Range)	39*,76*	36.7 (18-47)	38.0 (18-52)	38.8 (20-52)
Ethnicity			#	
White British	1	1	4	1
White - other	0	0	1	0
Indian	0	2	0	0
Pakistani	0	0	1	0
Black African	0	0	1	0
Black Caribbean	0	0	0	0
Mixed	0	0	0	0
Age left full-time education			^#	#
Mean (Range)	16*,20*	20.3 (18-23)	17.0 (15-19)	17.7 (15-21)
IMD quintile of area- level deprivation*				
% in 1-2	1	3	4	3
% in 3-5	0	0	3	1
No. people in household			#	
Mean (Range)	2*,2*	4.7 (3-6)	3.3 (2-4)	3.3 (1-7)
Most responsibility in household for:				
% Food shopping	1	1	4	3
% Meal choice	1	1	3	2
% Cooking	1	1	4	2

^ - 1 participant was still in education; # - 1 participant did not provide this information; * - actual values are shown

Table 16 details the responses that were received from participants who returned the 'recruitment decline' questionnaire, both closed and free-text responses. The most common reason that people gave was they did not want to risk having to wait 4-6 months to take part in the course. People also identified structural barriers to participation, such as shift work and childcare commitments. Courses were run at various times of the day and week, including evenings and weekends, but participants were expected to attend the same class for the duration of the course, so whilst there was some flexibility, those with work patterns that changed between weeks found it difficult to always accommodate the classes. One person said that they did not want to provide dietary or grocery spend information.

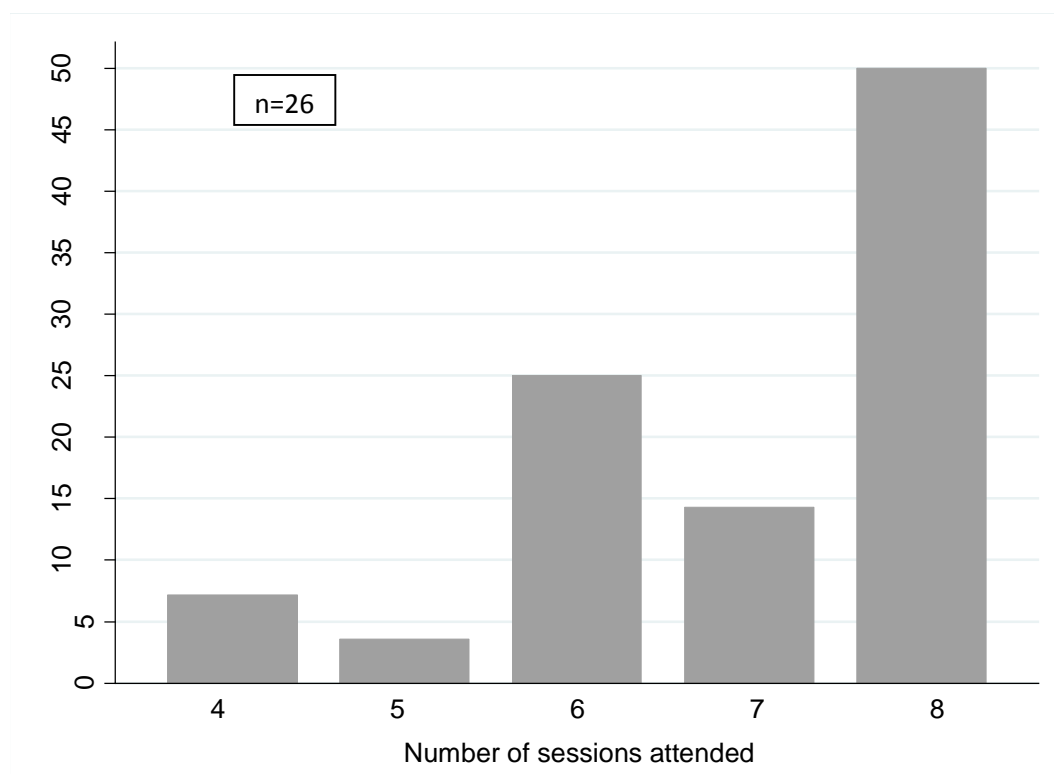
Table 16: Responses to questions asked regarding peoples' decisions not to take part in the research (before recruitment); 6 responses received

<i>Statement</i>	<i>No. agreed with statement n=6</i>
"I don't want to take part in a cooking skills course"	2
"I don't want to have to wait 4-6 months to take part in a cooking skills course"	4
"It would not be possible for me to attend the cooking skills course"	2
"The study involves too much effort"	0
"I don't want to give information about my diet"	1
"I don't want a researcher to visit me in my home"	0
Other reasons (free text)	"I work a shift pattern that prevents me from putting 100% effort in"
Reasons for not wanting to take part in cooking skills course (free text)	"Although I would like to take part it would be difficult to attend because of the children" "I have a two year old who attends nursery three afternoons but it would be really difficult to squeeze it in in so little time as I pick up kids at 3.15 and baby at 3.30"
Reasons why can't attend a cooking skills course (free text)	"Due to family commitments I would be unable to take part in your study"
Other comments (free text)	"Don't want to fill in a food diary or keep receipts" "As I don't want to wait 4-6 months to complete the course. I am restricted with work for available dates and early June is the only available time." "Maybe in future when my daughter in full time education I would access this course if it's available" "we cannot take part in your study because we cannot wait 3-4 months to start the course." "we don't want to take part because we cannot wait 3-4 months to start the course."

Attendance

Error! Reference source not found. shows the distribution of the number of cooking skills classes attended by participants in the intervention arm. The median number of sessions attended was seven, with half of participants managing to attend the full 8-week course. Some participants who worked shift patterns commented that this prevented them from attending fully, despite their desire to do so. This was because of the fixed day and time of the course, and the relative inflexibility of JOMoF to accommodate attendance at different classes; this is understandable from a planning perspective, where ingredients have to be purchased in advance based on the expected number of attendees. A small number of participants did comment that JOMoF had tried to accommodate them at another session if a session was missed, but this wasn't always feasible. Issues of attendance and flexibility of the courses are discussed further in the qualitative section of this report.

Figure 9: Distribution of the number of sessions attended by participants in the intervention arm (excludes participants who did not attend any sessions).



3.4.2. Process measures

Dietary data collection methods

We compared the number of missing days of data at baseline and follow-up for both methods. At both time points, the actual numbers and proportionate missing days were small. For 24-hour recalls, there were 1 and 5 missing days (out of 111 days in total for all participants) at baseline and at follow-up respectively. For 3-day food diaries there were 3 and 3 missing days (out of 105 days in total for all participants) at baseline and at follow-up respectively.

There were occasionally some difficulties in contacting participants to conduct telephone 24-hour recalls and often participants requested phone calls in the evenings, both of which made this method more resource intensive compared to food diaries, where just one home visit was conducted to interview the participant about the content of the diary.

Table 17 compares dietary measures by the method of dietary data collection, to assess whether the methods appear to results in consistently different measures of intake. The only two outcomes that appear to differ consistently are percentage of energy from non-milk extrinsic sugars, and portions of fruit and vegetables, although the differences between the two methods are negligible and the 95% confidence intervals overlap considerably, suggesting no real difference. However, it should be noted that participants were only allocated to one method of dietary data collection, not both, and thus there may have been some socio-demographic differences between participants which has influenced the data.

Table 17: Comparison of key dietary markers collected either by 3-day food diary or 3 x 24 hour recall interviews. Data is stratified by arm, and includes all participants who provided dietary data at baseline; all data are means and 95% confidence intervals unless otherwise stated.

	<i>Intervention</i>		<i>Control</i>	
	<i>3-day diary n=19</i>	<i>24-hour recall n=18</i>	<i>3-day diary n=18</i>	<i>24-hour recall n=17</i>
Energy intake (kcal/day)	1797.3 (1545.2, 2049.5)	2148.9 (1701.7, 2596.1)	1909.5 (1596.5, 2222.5)	1626.1 (1311.4, 1940.9)
NSP intake (g/day)	12.5 (10.3, 14.7)	14.8 (10.8, 18.8)	13.0 (10.0, 16.1)	10.8 (6.6, 15.1)
Salt intake (g/day)	6.7 (5.4, 8.0)	8.1 (6.2, 10.0)	9.1 (7.6, 10.5)	6.4 (5.3, 7.5)
% energy from fat	35.5 (32.8, 38.1)	34.9 (31.7, 38.1)	35.5 (32.4, 38.7)	37.0 (33.3, 40.7)
% energy from saturated fat	11.6 (10.4, 12.9)	11.6 (9.9, 13.3)	11.0 (9.5, 12.5)	12.3 (10.6, 14.0)
% energy from NMES	10.6 (7.3, 13.8)	12.2 (9.0, 15.5)	9.8 (6.3, 13.2)	13.1 (8.9, 17.3)
Median (IQR) portions of fruit and vegetables per day	2.6 (1.7, 5.1)	3.8 (2.1, 5.3)	2.2 (1.2, 3.0)	2.1 (1.2, 3.1)

Table 18 shows a range of the mean measures of attempts and time taken for various key data collection and entry tasks. Some telephone diet recall interviews had multiple attempts before successful contact was made. However, in-person home visits did not typically present the same challenge of participants being unavailable. Telephone diet recall interviews typically lasted around 8 minutes, and home visits lasted, on average, between 23 and 38 minutes depending on the method of dietary data collection; three-day food diary home visits would inevitably take longer because the full three days were being checked, as opposed to a single day for the 24-hour recall. Data coding and entry time was typically around 20 minutes, regardless of data collection method. The mean total researcher time needed to collect, clean and input the data was 170 minutes and 145 minutes for the 24-hour recall method and 3-day food diary method respectively. However, there were large variations in the average total time taken, suggesting that there may be little difference between the two methods in terms of resource intensiveness.

Additionally, for each of the two methods, an approximate participant time burden was calculated. This time was based on the time spent in recall interviews and home visits, and an approximation of the time likely spent completing the food diaries.¹¹⁹ These data suggest that completing a food diary may, overall, be slightly more burdensome for participants.

Table 18: Mean (95% CI) number of attempts OR time taken for data collection and processing tasks by dietary assessment method

	<i>3 day food diary</i>	<i>3 x 24 dietary recall</i>
Number of attempts to contact participants to conduct dietary assessment	1.0 (1.0,1.1)	1.6 (1.5,1.8)
Time taken (mins) per home visit	37.8 (34.6,41.1)	23.2 (21.5,24.9)
Time taken (mins) per telephone diet recall interview (1 x 24 hour)		8.3 (7.9,8.7)
Time taken (mins) to code and enter one day of dietary data	20.3 (17.2,23.5)	20.9 (18.4,23.4)
Total researcher time taken (mins) to conduct and process all data collection	145.3 (122.5, 168.1)	170.4 (147.4, 193.5)
Total participant time contributed (mins) to provide diet data	129.4 (119.2, 139.7)	101.2 (89.8, 112.7)

1- based on the assumption that each participant spent an average of 35 minutes per day completing the food diary¹¹⁹

Questionnaire – missing data

Table 19 shows the number and percentage for participants who did not provide full data. At baseline, two participants did not return the questionnaire; at follow-up, this increased to four participants. However, although the majority of participants returned the questionnaire, between a fifth and a quarter of questionnaires had missing data. It should be noted that the questionnaire was lengthy, and took around 20-30 minutes to complete, and that in cases where there were missing data, most were simple oversight of one sub-part of a question, rather than omission of full questions or sections due to a desire not to answer a particular question. Excluding questions that were free text and those that related to elicitation of data around spend on individual food items (which were only completed if receipts were not provided) there were a possible 129 responses, meaning that omission of one question or question sub-part is equal to 0.8% of the total questionnaire, and omission of six is equal to 4.7% of the total questionnaire.

Table E (in the appendix) gives a full breakdown of the count of number of times a question or sub-part of a question were missed. This shows there was no discernible pattern to the missed data, except for the question related to difficulties (with 21 sub-parts) that was omitted in its entirety by two participants at follow-up. A greater number of participants did not either keep grocery receipts as requested, or did not complete the alternative section of the questionnaire.

Table 19: Number and % of participants who did not provide full data at either baseline or follow-up

	<i>Baseline n=72</i>	<i>Follow-up n=56</i>
Provided questionnaire, but missed at least one question or one question sub-part	14 (19.4)	14 (25.0)
Provided questionnaire, but missed at least six questions or six question sub-parts	0 (0.0)	2 (3.6)
Did not provide questionnaire	2 (2.8)	4 (7.1)
Did not supply grocery receipts or complete the section of the questionnaire about grocery shopping	12 (16.7)	13 (23.2)

3.4.3. Participant & stakeholder views on study recruitment and participation

Participants in the focus groups and interviews were questioned regarding their experiences of recruitment process and factors which may or may not have affected their decision to participate in the study. Stakeholders were questioned regarding their experiences of being involved with the study.

3.4.3.1. Participants' views and experiences of the recruitment process

Participants recalled having been recruited to the study through a variety of routes. These included community groups, workplaces, and local mother and toddler groups, mobile demonstrations led by the local Ministry of Food (JOMoF) team and referrals from the JOMoF centres.

Community groups and workplaces

Community groups and workplaces appeared to have been a particularly effective recruitment setting. Participants reported observing posters or notices at their workplace which advertised the study and encouraged them to attend a presentation led by the Newcastle study team. Here they were given more information about the study and the opportunity to sign up:

“Well, (study team member) came in and addressed the group and he said he would like some volunteers.... So that’s how we all got involved” (Focus group A, males).

“It’s the internal Bradford Council web-page so it was on there...and it said come along to a food road-show...They were doing some food demonstrations and there were people from the Ministry of Food and then (study team) as well. So there were varying options to like join the cooking courses and obviously they (study team) were offering this other food study option” (Focus group B, mixed).

Where participants were recruited through community groups it was often the case that a large number of the group signed up for the study:

“It’s a men’s club and he asked for volunteers – I think he got about 12, didn’t he? Something like that. He got quite a lot” (Focus group A, males).

“It’s just a coffee morning where loads of mums get together and somebody had come in with the information that the cooking skills course were going on and who wanted to take part” (Participant interview D, female).

These participants felt that this made attending the course easier because the participants knew other people who would be on the course:

“Safety in numbers.....if one or two of us volunteered then we were happy. Was it not eleven or twelve people who signed up from here?” (Focus group C, males).

Many participants were glad to have other people they knew signing up for the study as they felt that not knowing anyone on the course would be a potential barrier for attending. This confirms the value of recruiting through existing networks such as community groups and workplaces.

Ministry of Food centres and mobile demonstrations

Some participants were referred to the study by others who believed they might benefit from participation. These individuals were informed of the course either by people they worked with or through local community support units working in partnership with the Ministry of Food. One participant in particular was referred to the JOMoF as part of his recovery from alcoholism and it was suggested that taking part in the course would help him to improve his health because he would learn about nutrition and basic cooking skills. The facilitator at JOMoF then mentioned to him that he might be able to take part in the study:

“The recovery unit, the people from there had an agreement with Jamie Oliver’s Cookery Group which is nearby to the city, that some people could go there for therapy you know learning basic cooking skills and things like that” (Participant interview B, male).

Other participants who reported that they already had an interest in attending a cooking skills course were recruited to the study because they contacted their local Ministry of Food centre where they were informed of the study. They then actively pursued the study team in order to take part:

“I just went in and found out the information and I, myself, got all the information and I called them, put pressure on them to put me on the group and that. So I was basically very much interested in cooking” (Participant interview H, female).

“Oh yeah, I was, I used to come into the gym, the leisure centre in East Ham, and I have seen people they are.....you know downstairs, one day I have seen the board and I asked them about cooking skills. One lady was telling that me that I could do the course, we will send you a form or something else, phone you, I didn’t remember about that time. And then they said the course will start, you are entitled, you can come, and then you start like that” (Participant interview J, female).

One group also reported that they heard about the study by attending a mobile demonstration led by the JOMoF team. They were attracted to food demonstrations and when they enquired about the various options to attend the cooking course they were informed of the option to take part in the research study:

“They were doing some food demonstrations and there were people from the Ministry of Food and (study team) as well. So there were varying options to join the cooking courses and obviously there was this other food study option” (Focus group B, mixed).

3.4.3.2. Factors influencing participants’ decisions to participate

Participants described a range of motives for participation in the study, including the opportunity to refresh knowledge and skills, to learn basic cooking skills, to learn more about how to eat healthily and as a social or leisure activity. Each theme is presented below, as well as findings on the relevance or otherwise of the Jamie Oliver/Ministry of Food brand to the decision to participate, and any anxieties or concerns participants had prior to attending the course.

Refreshing knowledge and skills

For those who were already interested in and fairly confident about cooking, the course presented an opportunity to refresh their knowledge and skills and to garner some new ideas.

“It was something I’d been thinking about doing for a while because I was interested in what the course was delivering and just to get some ideas of the different foods to prepare at home for the kids and yeah just a bit of a refresher really on things” (Participant interview C, female).

“Well, I love cooking. We do a lot ourselves already, so it was just to see if there was anything we didn’t know or anything you know we could learn” (Participant interview F, male).

These more experienced cooks were focused on improving their cooking skills and were keen to address any gaps in their knowledge:

“I mean, I’m quite a good sort of cook anyway but, as I say, there was some gaps, particularly in baking and making bread and cakes and buns and things” (Focus group A, males).

“Yeah and things like I’ve always been awkward chopping vegetables and again we are being shown how to chop vegetables properly and it’s great you know, some of us make a bit of a mess of it” (Focus group C, males).

An additional driver for two participants who had immigrated to the UK was to learn new techniques and recipes. They were already skilled at cooking food from their own culture and, out of a desire to branch out and at the request of their children who attended school with children from different cultural backgrounds, wanted to learn a more ‘Western’ or ‘English’ style of cooking:

“I know how to cook Asian dishes. I want to try new because I’ve been here for 14 years. My kids, they wanted to eat some of the stuff here so that’s why. Trying new things, you know, that’s my passion” (Participant interview H, female).

“Mainly to improve, the reason for my joining cooking class was basically, I do a lot of Asian cooking.... But for me, the main intention was also to learn specifically...an English way of doing things, of English cooking” (Participant interview I, male).

Learning basic cooking skills

For those participants who were less experienced and less confident about cooking, a key motive for participation was to learn some basic skills. Some participants had little experience of ‘cooking from scratch’ because they had either not previously had to cook for themselves or had managed to get by on microwave meals and processed foods:

“I think my main reason for going is to try and encourage me to do a bit more cooking you know, instead of buying ready meals or whatever, so that was probably my main reason” (Focus group B, mixed).

“I want to learn cos I’m on my own. I want to learn how to cook properly. That’s what I’m doing it for. Living on me own it’ll come in useful” (Focus group A, males).

“Well I’d never done any cooking before at all so it’s all new to me. And I nearly didn’t sign up but I did eventually at the last minute” (Focus group C, males).

Some of these less confident cooks talked about wanting to learn time-saving tips or other shortcuts which would make cooking more accessible to them:

“I was looking for short cuts in cooking you know, cut down time and things like that. There are a lot of things you can pick up which makes it easier” (Focus group C, males).

“Which is why I wanted to do this course cos I can learn how to make some simple meals quickly” (Focus group A, males).

Healthy cooking and making changes to diet

For a few participants, a motive for joining the study was to learn more about cooking healthily. Some were conscious of general injunctions to eat healthily, or were aware that their own diet had room for improvement. Some perceived that healthy eating was the main objective of the study and cooking course:

“Well it was about healthy eating but also to encourage you to eat and cook fresh food wasn’t it really, so, and to see whether going on the cookery course would improve your cooking skills or your likelihood to eat fresh cooked food, so that was what it was about wasn’t it?” (Focus group B, mixed).

Some participants were driven by specific concerns about their health. One described having recently had surgery which had prompted him to examine his diet, specifically in terms of reducing fat intake; another had been advised by her doctor to change her diet and get more exercise:

“And this year I had my gallbladder removed so I knew I had to change my diet and make it a little bit more healthier, low fat and things so I just thought it might be a bit interesting to do that” (Focus group B, mixed).

“My doctor told me whatever you are eating be very cautious and not only that but you need exercise, walking, or yoga, or gym or swimming. That is what I started this year. I stopped middle time last year after because too much 185 my blood pressure so this time I stopped and then I started” (Participant interview J, female).

For one participant, a recent weight loss had increased her confidence in several aspects of life, and attending the cooking classes gave her the opportunity to build on this newly-found confidence and to shore up her desire to keep the weight off:

“I think if I’d come before I’d lost the weight I would not have gone. I’d have felt a little like ‘On no, out my comfort zone,’ but I think because I wanted to lose it and...I want all this information to keep it going” (Participant interview D, female).

Meeting people, improving confidence and self-esteem

For a few participants, an additional appeal of the study was that it offered a new leisure or social activity. The course provided an opportunity for participants to meet new people and socialise with others on a regular basis:

“I think the other thing is, it’s like meeting people as well, you know, and getting out of the house and interacting with other people” (Focus group A, males).

“It is nice to do though, it is different, and it is you know, it gets you out” (Focus group D, mixed)

“Yeah, and to meet other people” (Focus group D, mixed).

One participant mentioned that she wanted to take part in the cooking skills course in order to improve her self-esteem and confidence levels by interacting with different types of people:

“Next is self-esteem you know, when you do something yourself...it’s good...that type of course if you do enjoy meeting different types of people” (Participant interview J, female).

Anxieties or concerns regarding taking part in the study

Generally, participants reported that they had not found it difficult to commit to the course, partly because a choice of timeslots or location was offered (for example, evening or daytime courses), and partly because their own routines permitted some flexibility:

“Mine was a three o’clock, I am lucky because work says I can take the time off to do it. Well I wouldn’t have been in it otherwise” (Focus group B, mixed).

“How this was worked out was mainly because they asked us the preferred location. They did give us three options, within London, so they did ask us where you want to do it near your

home or do you want to do it somewhere, you know, in near the place you work?" (Participant interview I, male).

Some participants were nervous about taking part in the study because it meant attending a cooking skills course which was something they had not previously experienced. Those who attended the cooking course as individuals mentioned how nervous they were at the beginning of the course:

"After the first couple of weeks, I kind of was a bit nervous because you know I'd not done, I'd been a while out of the main stream generally so I've not done these things and they were new people to me and it's old habits die hard and being sort of eased into trying your palate and change to new things you know, try new things, that are ultimately going to be better for you" (Participant interview B, male).

Knowing someone who had already attended the JOMoF course helped some participants overcome any reservations they might have had regarding the decision to sign up for the course and to be involved in the study.

"Well my partner had done the course a year previous, but on his own because he were a bit useless and didn't really know much, so I think he had seen them at a separate road-show somewhere else and he had done the course and really enjoyed it" (Focus group B, mixed).

Relevance of Jamie Oliver on decision to take part

The Jamie Oliver brand name was generally not a major factor in the participants' decision to attend the course or sign up for the study: while some had been aware of the connection beforehand, others had not until they arrived for the first class. However, they recognised it was a high profile name which they felt brought an extra level of prestige to the course. They also appreciated his ability to make cooking accessible to everyone, including those with little or no experience:

"And Jamie Oliver is quite high profile you know with his things with kids and making cooking sort of interesting for people who might not otherwise have been all that bothered about expanding their knowledge about things like that" (Participant interview B, male).

"His enthusiasm and his passion for food and he makes it accessible to you" (Focus group A, males).

Some participants who were more knowledgeable about Jamie Oliver spoke about his various campaigns, particularly his work on school dinners, and perceived him as a celebrity chef with strong values and views:

"I've always liked Jamie Oliver cos he believes in what he does and he stands by it. I always remember when he got on about healthier food for kids" (Focus group A, males).

"I suppose I've always followed Jamie Oliver's different initiatives and what he's done. And particularly with building the Academy of Food and what he did for school dinners, so it's kind of something that I've followed and agreed with so I suppose it's just an interest that has stemmed from that as well" (Participant interview C, female).

3.4.3.3. Stakeholder motivations for taking part in the research

The stakeholders believed that taking part in an evaluation was very important for the future success of the cooking skills course. Stakeholders were also keen to stress how the course had developed since its inception and how evaluation could play an important role in developing the course in the future.

Stakeholders were motivated to take part in the study by a desire to establish an evidence base which would be used to measure the course against its agreed outcomes:

“It was a natural thing that we would get involved with the...research, to help us prove the evidence base and really show that the service is meeting the outcomes that we’ve commissioned for” (Stakeholder 2).

“Obviously an evaluation is going to show, you know, what your strengths and weaknesses are, then it’s something that you need to improve on, isn’t it? You know, so, and without evaluation, how can you do that?” (Stakeholder 6).

Although one stakeholder admitted to some initial trepidation regarding the evaluation, they mentioned that being involved in the study had changed their opinion and felt that evidence from research studies could lend the course added credibility:

“Obviously now I realise how amazing it (evaluation) is and how powerful it is, because then other people take you seriously. It’s actually down there on paper. When you see the various graphs and pie charts, it’s like wow that is amazing. Yeah people do take it more seriously” (Stakeholder 3).

Stakeholders felt that being part of an evaluation was extremely important to developing the cooking skills course in the future and mentioned that involvement in the study had helped them to think about how the course has developed since its inception:

“No, evaluation is very, very important. We can’t do anything without it really and I think that, probably when the Ministry of Food programme was first set up, you know, it was from a TV programme...and now it’s developed so much, an evaluation probably wasn’t a priority when it first started but absolutely now, especially in terms of funding and understanding what’s working, what isn’t working, who we’re reaching, how we’re reaching them and what we can make better” (Stakeholder 4).

3.4.4. Participants’ and stakeholders’ views and experiences of the research methods

Participants and stakeholders were questioned regarding their views and experiences of the research study and materials. Although many respondents kept their responses on this topic brief, there were several areas which participants felt their opinions and experiences might be of use to the study team. These areas are discussed below under the following headings: advantages and disadvantages of being involved in the study, experiences and acceptability of completing the study instruments, and acceptability of the waiting list concept.

3.4.4.1. Participants' views and experiences of the research methods

Advantages and disadvantages of being involved in the study

Overall, participants appeared to have enjoyed participating in the study and not to have found the experience too onerous. In general, participants did not appear to have found the questions intrusive, and did not seem to have found completing the various instruments unduly burdensome. Several made positive comments about the helpfulness of the researcher leading the data collection. A few participants felt that participating in the study had been an interesting experience because it had encouraged them to think about their dietary habits in a way they had not previously:

"It's been worthwhile because it's helped me to change, or will help me to change slowly, which I think is the idea. Helped me to think about what I am eating, what I am buying which is very important" (Participant interview B, male).

"I said that will make it even more interesting because it will make me think more. I am getting the cooking skills but I am actually answering questions and writing things down and that will stick in my mind. So I am getting more knowledge than just doing the actual course" (Participant interview B, male).

Some participants also welcomed the opportunity for their activities to have a wider impact and to contribute to a research project:

"I've loved it. I think it's just a bit different you know, you know you are involved in something a bit bigger...Obviously I don't know where it's all going or what's going to come out of it but you've done your bit to contribute to that" (Focus group B, mixed D).

Experiences of, and acceptability of, completing the study materials

It was not always clear to the interviewers which participants had filled in which research instruments, and participants' own recall was often limited, meaning that it was difficult to gain detailed feedback on experiences of completing the different research instruments.

Overall, participants appeared to have found completing the food diary and questionnaire relatively straightforward, although a few difficulties, described below, were encountered. Several participants described the process of filling in the diaries and questionnaires as "amusing" and "interesting" (Focus group A, males), but also found the process "a bit strange" (Focus group D, mixed).

Some participants admitted that there was "a bit of guesswork" (Focus group A, males) involved in filling in the food diaries. If participants did not remember to fill in the diary that day, they tended to forget what they had eaten and drank. One participant mentioned that they found the diary quite complicated to fill in at first:

"It was a while before I realised that there is one page which is from breakfast and lunch time and then at lunch time and I will fill the whole page in and I thought this can't be right. Then it dawned on me then I saw the times at the top" (Focus group C, males).

Others found it tricky to remember exactly what they had eaten and felt that the portion sizes were difficult to judge:

“(The diary was) a bit fiddly and sometimes I’d forget to do it you know and make it up, or forgot to do it for this morning and then you’d have to you know work out what I’d had earlier in the day” (Focus group C, males).

“If it was more the fact of just saying what you had a day and you didn’t have to put how much of a proportion it were and all like that, it would have been easier than going into this size portion, this size portion, I exceed all of them” (Focus group D, mixed).

However, one participant found this process unpleasant as it highlighted what they felt was their poor diet:

“I hated doing the diary...It highlighted what my problems were – things I did wrong and I didn’t like that” (Focus group D, mixed).

One group mentioned that they found the process of going over their diaries with the study team quite time-consuming and would have preferred to fill them in themselves:

“If they had put the booklets in with it, where you could have wrote down the code yourself instead of having to go over it over and over again and say it’s exceeding that, it’s below that” (Focus group D, mixed).

“We’d have filled it in, he’d have come and collected it, and that’s it done” (Focus group D, mixed).

The food diary also appeared to led some participants to question their current eating habits, and for some filling in the food diary also highlighted the fact that they did not monitor how much they were spending on food when they went to the shops, and being involved in the study was useful in highlighting this:

“Well, the one thing it highlighted to me is I haven’t got a clue what we spend on food. I sort of tend to do the shopping but it’s willy-nilly and I know we waste a lot of money on stuff that gets thrown out” (Focus group E, males).

However, several participants found it difficult to remember to save their receipts and felt that it was too complicated to calculate their total food bill in if they shopped at a variety of places:

“She did say you could keep your receipts and they calculate it that way but I said that would be too much bother actually” (Focus group A, males).

“I had to save my receipts but I’m terrible with receipts, I just put them straight in the bin” (Participant interview D, female).

It was mentioned that those who did most of their shopping online found it easier to produce receipts than those who may have visited a variety of shops:

“I do all my shopping online anyway so I just provided the actual receipt, so to me that was just easier” (Focus group B, mixed).

Participants also recalled filling in a questionnaire at the beginning of the study and on completion of the course. The consensus was that this questionnaire was relatively straightforward although it was described as “quite involved” (Focus group A, males). The questionnaire also encouraged participants to think about their diet:

The questionnaire especially, what I have done, it’s all making me think what my diet was. Sometimes you can lie to yourself but that kind of question is telling me, ‘Yes, I’m doing this’ something you know” (Participant interview H, female).

Understanding and acceptability of the waiting-list concept

In general, the participants did not find the concept of the waiting list to be a problem and accepted it was part of the study:

“It was fine, it would have been better if I could have done it in the first batch but obviously it was explained that there was a chance I could be in the other batch so it was fine” (Focus group B, mixed).

However, some participants mentioned that this might not be acceptable to everyone in the future:

“If you’d signed people up to do a course and then you’d told half of them that they couldn’t do it for a year, how do you think people would react to that? People don’t like waiting in this society do they?” (Focus group E, males).

“That’s what it is and that’s why waiting lists would put many people off” (Focus group D, mixed).

One participant who was placed on the waiting list voiced their displeasure at having to wait to attend the course:

“Well I was not very happy about it, being on the waiting list and everything. I was promised and there was no reason that has been provided” (Participant interview I, male).

Several participants admitted that they did not fully understand the purpose of the waiting list or why they were on it. These comments are indicative of a general uncertainty regarding experimental research (in the second comment, the participant has clearly confused the concepts of ‘control’ and ‘placebo’):

“I don’t really remember the purpose of it I just know that there would be two different batches” (Focus group B, mixed).

“Well I know what a placebo means but I don’t particularly understand why I am the placebo, you know” (Focus group C, males).

3.4.4.2. Stakeholders’ views and experiences of the research methods

Stakeholders’ views of working with the study team to recruit participants

Stakeholders worked with the study team to recruit participants to the study. This included putting on cooking demonstrations in workplaces and community settings. Working with the study team also

helped the stakeholders to build relationships with local communities. An added benefit to being involved in the research study was that some participants were to complete the course that may not have been able to afford it otherwise.

Stakeholders from the Ministry of Food centres mentioned that they worked closely with the study team to recruit participants and the centre staff were happy to assist the research team provided the recruitment approach fitted with their existing tactics:

“So we did go out with (the study team) a few times and do like little tasters and demos, to try and recruit participants onto the work, which was fine because we try and do bits of that anyway, as recruitment, so it kind of fit into our marketing” (Stakeholder 1).

“It involved a couple of mornings out of your time or lunchtimes out of your time, to go and to do that but I wouldn’t say it was lots and lots of, you know, hard work cos, like I say, we’ve got the equipment anyway so we’ve got, like, table cloths and everything that we would take to an event so it’s just really a case of getting some posters put up in advance and booking the venue and, you know, just liaising with the site managers to get a table so, it wasn’t, you know, it weren’t that hard really” (Stakeholder 5).

Working with the study team had encouraged the stakeholders to engage with certain parts of the community with whom they previously had little contact:

“And, to be honest, like, they’re the kind of people that we probably would never have reached because they work kind of shift work and things and the other places we go - so say we went to leisure centres, community centres – it’s very unlikely that they’ll be going to those places so, actually it’s probably highlighted something to us, for us to try and go and do that anyway. So that was probably a good thing that we had to do that extra little thing” (Stakeholder 1).

“I think any opportunity to learn more about the communities that you’re working with - what they found as strengths of the service; what changes they would potentially like to see is only valuable for the service to develop and ensure that it’s open accessible and working with people who need the support, and also, I suppose, we’re also learning from kind of things that people find are really valuable” (Stakeholder 2).

One stakeholder mentioned that they were keen to build on these new relationships and continue to work with these groups in the future:

“Yeah. I mean, we have built on it already so, you know, they’ve invited us to, like, their forum and things like that so, yeah, I think that’ll just be ongoing now, working with them” (Stakeholder 5).

In addition, stakeholders mentioned how positive it was that certain individuals were now able to come on the course where they might not have been able to afford it had it not been for the study:

“I put them in touch with (study team), right at the beginning, to say that they couldn’t afford it, they’d like to do the evaluation, so we’ve had a few people from there where it’s sort of benefitted” (Stakeholder 5).

“So we tried to maybe target people who might not have been able to afford to come.... People on means tested benefit or people who don’t really have enough money to pay for the course” (Stakeholder 6).

Stakeholders’ views regarding a definitive trial

Stakeholders gave their views regarding the possibility of moving to a definitive trial. Although this was viewed quite positively, some stakeholders expressed concerns regarding placing participants on a waiting list and the possibility of losing customers.

When questioned about the possibility of moving to a definitive trial, one stakeholder expressed concerns over the acceptability of placing some participants on a waiting list:

“I think it would put people off and I think, for us, it would be a bit awkward for us to kind of link ourselves to that, because we don’t want to be seen to be preventing people from joining or telling them when they can and can’t – I think that would be awkward and it would be a case of us having to make it clear that that’s part of the study and that is going to happen, or that could happen. If they don’t want that happen, then they can join normally and pay their own. Or they can do it as part of the study. But I do, yeah; I think that would be my biggest concern with it” (Stakeholder 1).

This was felt to be of particular concern when dealing with groups from deprived communities who were viewed as most in need, and for this stakeholder raised ethical concerns:

“And I think, for us, as well, like, if we’re trying to target them deprived areas and someone is showing an interest in doing the course, they might – like, for their health, they might need to join that course – and if they’re waiting for 12 months, is that going to affect their health when they could have improved it earlier?” (Stakeholder 1).

There was also a concern that participants would become disinterested and disengaged from the study if they were placed on a waiting list:

“I, personally, would lose interest cos you’d forget about it and I think, I think it’s the ‘now,’ you know, and I think it’s, once you’ve got somebody interested, you need to hook ‘em straight away...I think if they’re interested, they should sort of be able to do it there and then, not say, ‘We’ll leave you a year,’ cos by that time, a year’s come and gone and you think, ‘Oh well, I can’t be bothered now,’ or you’ve found something else of interest or, you know, so I think a year’s probably too long to say that to somebody” (Stakeholder 5)

3.4.5. Secondary outcomes – socio-demographic characteristics, cooking skills and diet

The following pages present the baseline socio-demographic characteristics, dietary information and self-reported cooking skills of participants, as well as brief details of data that were collected in the questionnaire around some other domains. The following research questions are addressed:

8. *What are the baseline self-reported cooking skills, diet and socio-demographic characteristics of participants of a cooking skills intervention?*
9. *How do the baseline self-reported cooking skills, diet and socio-demographic characteristics of wait-list recruits compare to community recruits?*
10. *Do the socio-demographic characteristics of community wait-list recruits align with those identified as most in need of cooking skills interventions from research questions 1-4?*

Socio-demographic characteristics

Table 20 shows the demographic characteristics of the pilot study participants. The table presents data for all participants who were recruited, provided baseline data and intended to continue in the study (i.e. the participants who would be included in an intention to treat (ITT) analysis in a definitive trial. This group includes those who subsequently dropped out, became uncontactable or did not provide follow-up data. The table also shows data for participants who were recruited, provided baseline data and continued in the study as planned, provided follow-up data and attended at least 50% of the cooking skills classes if they were in the intervention group. This is labelled as the 'per protocol' (PP) analysis group (as defined for a definitive trial). As this is a pilot study and does not seek to determine efficacy of the intervention, data on changes between baseline and follow-up are only shown for the PP participants.

The majority of community-recruited participants were male, aged over 30 years, white British, possessed only secondary level education and resided in areas with high levels of socio-economic deprivation. The typical household composition of the sample was 2-3 persons and around half of the participants had sole responsibility for food shopping, meal choice and cooking in the household.

The small sample of participants recruited from the wait-list were mainly female, slightly younger than the community participants, came from smaller households in less deprived areas and had greater responsibility for shopping, meal choice and cooking. However, it cannot be said with any certainty that the participants who were recruited from the wait-lists were representative of the type of person that self-selects to take part in the cooking skills course, because of the small sample size and single location that they were recruited from. However, participants recruited from the wait-lists did appear to be somewhat different from those who were recruited from the community. Details of the socio-demographic characteristics of participants who dropped out can be found in Table 15.

Table 21 provides further details about the socio-demographic characteristics of participants by site of recruitment. As discussed earlier in this section, the aim was to recruit a majority of males at all sites except Leeds; the success of the recruitment strategy is reflected in the demographic details shown, with mostly males recruited at all sites except Leeds. Due to the nature and mode of recruitment, there are some differences between the demographic details for each of the sites. For example, a younger and more ethnically diverse sample were recruited in Stratford, reflecting the type of recruitment employed and the ethnic composition of the local area. Their reliance on others for meal planning, shopping and cooking is also evident compared to the generally older participants in the other locations. Participants in Bradford tended to be older than those at the other locations, mainly because of the use of the older men's support group that was used as a vehicle for recruitment. The greatest proportion of participants from the least socio-economically deprived areas can be seen in Newcastle; this may be because of the relatively well-paid train driving jobs that many of the participants had.

Table 20: Baseline socio-demographic characteristics of all participants who were recruited to the study, provided baseline questionnaire data and were randomised - stratified by recruitment type and intervention arm. Also shown are baseline socio-demographic characteristics for those who remained in the study (PP) vs those who dropped out of the study (ITT); unless otherwise stated, values shown actual numbers.

		<i>Community recruitment</i>		<i>Wait-list recruitment</i>		<i>All participants – baseline (ITT)</i>		<i>All participants – follow-up (PP)</i>	
		Interv- -ention (n=32)	Control (n=32)	Interv- -ention (n=5)	Control (n=3)	Interv- -ention (n=37)	Control (n=35)	Interv- -ention (n=27)	Control (n=29)
Sex	M	21	21	1	2	22	23	18	19
	F	11	11	4	1	15	12	9	10
Age									
	Mean (SD)	43.1 (17.2)	44.5 (16.7)	45.6 (7.1)	30.0 (14.2)	43.4 (16.1)	43.2 (16.8)	43.3 (16.3)	44.8 (17.3)
Ethnicity									
	White British	25	27	4	3	29	30	23	26
	White - other	1	0	0	0	1	0	0	0
	Indian	1	3	0	0	1	3	1	1
	Pakistani	1	0	1	0	2	0	1	0
	Black African	1	1	0	0	1	1	0	1
	Black Caribbean	1	0	0	0	1	0	0	0
	Mixed	1	0	0	0	1	0	1	0
Age left full-time education									
	Mean (SD)	18.5 (3.6)^	17.4 (2.7)	17.2 (2.3)	18.3 (4.0)	18.3 (3.4)	17.5 (2.8)	18.5 (3.7)	17.3 (2.7)
IMD quintile of area-level deprivation*									
	No. (%) in 1-2	25 (78.1)	26 (81.3)	3 (60.0)	2 (66.7)	28 (75.7)	28 (80.0)	21 (77.8)	23 (29.3)
	No. (%) in 3-5	7 (21.9)	6 (18.8)	2 (40.0)	1 (33.3)	9 (24.3)	7 (20.0)	6 (22.2)	6 (20.7)
	Mean (SD) No. people in household	2.9 (1.4)	3.4 (1.6)	2.4 (1.1)	2.7 (1.5)	2.8 (1.3)	3.3 (1.6)	2.9 (1.4)	3.1 (1.4)
No. (%) of people with most responsibility in household for:									

Food shopping	18 (56.3)	17 (53.1)	5 (100.0)	2 (66.7)	23 (62.2)	19 (54.3)	17 (63.0)	16 (55.2)
Meal choice	17 (53.1)	16 (50.0)	5 (100.0)	2 (66.7)	22 (59.5)	18 (48.6)	17 (63.0)	16 (55.2)
Cooking	19 (59.4)	16 (50.0)	5 (100.0)	3 (100.0)	24 (64.9)	19 (54.3)	18 (66.7)	17 (58.6)

^ - 2 participants still in education; * - 1 is most deprived and 5 is least deprived

Table 21: Baseline socio-demographic characteristics of all participants who were recruited to the study and provided baseline questionnaire date, stratified by site; unless stated, actual numbers are shown.

		<i>Community recruitment</i>				<i>Wait-list recruitment</i>
		Bradford (n=21)	Leeds (n=16)	Newcastle (n=14)	Stratford (n=16)	Bradford (n=8)
Sex (%)	M	18	2	14	10	3
	F	3	14	0	6	5
Age						
	Mean (SD)	60.2 (12.7)	38.7 (10.9)	44.5 (8.8)	28.8 (15.4)	39.8 (12.3)
Ethnicity (%)						
	White British	19	14	13	8	7
	White - other	2	0	1	0	0
	Indian	0	0	0	4	0
	Pakistani	0	0	0	1	1
	Black African	0	0	0	2	0
	Black Caribbean	0	0	0	1	0
	Mixed	0	2	0	0	0
Age left full-time education						
	Mean (SD)	17.5 (2.7)	17.4 (3.5)	17.4 (2.6)	19.5 (3.5)^	17.6 (2.8)
IMD quintile of area-level deprivation*						
	No. (%) in 1-2	17 (81.0)	15 (93.8)	7 (50.0)	13 (81.1)	5 (62.5)
	No. (%) in 3-5	4 (19.0)	1 (6.2)	7 (50.0)	3 (18.9)	3 (27.5)
Mean (SD)No. people in household		1.9 (1.0)	3.7 (1.0)	3.2 (1.5)	4.0 (1.4)	2.5 (1.2)
No. (%) with most responsibility in household for:						
	Food shopping	12 (57.1)	13 (81.1)	6 (42.9)	5 (31.3)	7 (87.5)
	Meal choice	12 (57.1)	11 (68.8)	5 (35.7)	6 (37.5)	7 (87.5)
	Cooking	12 (57.1)	12 (75.0)	6 (42.9)	6 (37.5)	8 (100.0)

^ - 2 participants still in education; * - 1 is most deprived and 5 is least deprived

Cooking skills & cooking confidence

Table 22 shows the baseline measures of cooking confidence, cooking skill and frequency of preparing a main meal either from scratch, or from pre-prepared ingredients. Only around half of the sample reported being confident at cooking from basic ingredients, although around three quarters said that they were confident at following a simple recipe. In terms of the eight specific cooking techniques that we asked about the mean number that respondents said they were confident at using was approximately six, across both study arms. Between 50% and 60% of participants said that they could prepare a main meal from basic ingredients ‘with no help at all’, and very few participants reported preparing a main meal ‘from scratch’ on every day of the week.

Table 22 also shows the difference in baseline FV intake and cooking skills and confidence between those who were recruited from the community and from the wait-list. It is difficult to make meaningful comparisons between the characteristics of the different recruitment methods because

of the small number that were recruited from the wait-list, but the data suggest that those from the wait-list may have been less confident at preparing main meals from scratch, but more confident at cooking from pre-prepared ingredients.

Table 23 shows, by study arm, the change in cooking skill and confidence, and the frequency of cooking from scratch or from pre-prepared ingredients for participants who remained in the study. Compared to the control arm, there was an increase in the intervention arm in the proportion of participants who reported being confident at; preparing a main meal from basic ingredients; preparing and cooking new foods; that what they cooked would 'turn out' well; and at tasting new foods. At follow-up, four-fifths of intervention arm participants reported that they were confident at preparing a main meal from basic ingredients.

There were also increases in the proportion of participants in the intervention arm who reported being able to prepare a main meal 'from scratch' with no help at all, as well as an increase in the proportion who reported that they could prepare a main meal from pre-prepared ingredients, and cakes and biscuits, with no help at all. There is also an increase in the proportion of participants in the intervention arm who reported preparing a main meal from basic ingredients four to six times a week, compared to the control arm, but no increases in the frequency of preparing a main meal from pre-prepared ingredients.

Dietary intake

At baseline, median intake of fruit and vegetable (FV) portions differed slightly between intervention and control arm participants, despite both arms being balanced in terms of socio-demographic characteristics. Participants in the control arm also had a slightly lower energy intake than those in the intervention arm, although the remainder of the dietary measures were comparable between arms. Community recruits had a slightly lower intake of fruit and vegetables, but a higher energy intake, and higher proportions of energy from fat and saturated fat (Table 22). There was a much greater spread of intake for participants in the intervention arm at both time points (Table 23).

All of the above differences must be interpreted with caution due to the small number of participants overall, and in particular the very small number who were recruited from the wait-list.

Table 22: Baseline measures of dietary intake and measures of cooking skills and confidence; unless otherwise stated, figures shown are percentages. Data is stratified by study arm and analysis type and is pooled from both data collection types.†

	<i>Intervention (ITT)</i> <i>n=36[#]</i>	<i>Intervention (PP)</i> <i>n=26[#]</i>	<i>Control (ITT)</i> <i>n=34[#]</i>	<i>Control (PP)</i> <i>n=25[#]</i>	<i>All community recruits</i> <i>n=65[#]</i>	<i>All wait-list recruits</i> <i>n=8[#]</i>
Median (IQR) portions of fruit and vegetables per day	3.5 (2.0, 5.1)	3.5 (1.7, 5.3)	2.2 (1.2, 3.1)	2.3 (1.2, 3.0)	2.6 (1.4, 4.0)	2.9 (2.2, 5.9)
% of participants consuming 5-a-day	27.0	33.3	11.4	10.3	18.8	25.0
Mean (SD) energy intake (kcal/day)	1968.4 (741.9)	1985.6 (742.5)	1771.9 (628.6)	1715.0 (571.1)	1845.8 (688.0)	2089.6 (727.4)
Mean (SD) NSP intake (g/day)	13.6 (6.5)	13.5 (7.1)	12.0 (7.2)	12.4 (7.8)	12.8 (7.1)	13.1 (4.4)
Mean (SD) salt (g/day)	7.4 (3.3)	7.6 (3.2)	7.7 (2.9)	7.6 (2.6)	7.6 (3.1)	7.6 (3.1)
Mean (SD) % energy from fat	35.2 (6.7)	35.4 (5.9)	36.3 (6.7)	36.2 (5.8)	35.4 (6.4)	38.1 (5.5)
Mean (SD) % energy from saturated fat	11.6 (3.1)	11.8 (3.0)	11.6 (3.2)	11.7 (3.5)	11.4 (3.0)	13.4 (3.4)
Mean (SD) % energy from NMES	11.4 (6.6)	11.1 (6.0)	11.4 (7.6)	10.5 (7.0)	11.5 (7.1)	10.3 (5.1)
% who reported being confident:						
at being able to cook from basic ingredients	50.0	53.9	58.8	56.0	53.4	37.5
at following a simple recipe	77.8	84.6	70.5	72.0	73.9	75.0
at preparing and cooking new foods and recipes	52.8	50.0	32.4	28.0	43.1	12.5
that what will cook will 'turn out' well	50.0	57.7	38.2	32.0	44.6	16.4
tasting foods that have not eaten before	50.0	53.8	44.1	44.0	41.5	75.0
Mean (95% CI) number of individual techniques reported confident at using [§]	6.1 (1.8)	6.4 (1.6)	5.8 (2.0)	6.0 (1.8)	6.0 (1.9)	6.1 (1.6)
% who can prepare the following dish types with no help at all:						
Ready Meal	77.8	80.8	85.3	88.0	81.5	87.5
Main meal from pre-prepared ingredients	69.4	76.9	58.8	64.0	66.2	50.0
Main meal from basic ingredients	52.8	53.9	55.9	60.0	52.3	62.5
Cake or biscuits from basic ingredients	30.6	30.8	29.4	24.0	30.8	25.0
% who reported that they prepare a main meal:						
from pre-prepared ingredients 4-6 times per week	25.0	26.9	20.6	20.0	16.9	62.5
from pre-prepared ingredients daily	0.0	0.0	5.9	4.0	3.1	0.0
from basic ingredients 4-6 times per week	13.9	11.5	11.8	16.0	10.8	25.0
from basic ingredients daily	8.3	3.9	5.9	4.0	7.7	0.0

^ - geometric mean portions of fruit and vegetables at baseline and follow-up; * - denominator is n minus participants who reported living alone; § - Participants were asked to report yes/no as to whether they were confident at using eight cooking techniques (boiling, steaming, frying, stir-frying, grilling, roasting, stewing, microwaving) - the sum of those techniques they reported 'yes' to were summed to give an overall score; # - dietary data based on 37/27 respondents in intervention arm, 35/29 respondents in control arm (as some participants provided dietary data but did not return their questionnaires) and 64/8 in community/wait-list recruitment methods; † - participants completed either a 3-day food diary, or took part in 3 x 24h recall interviews (see table x for breakdown by study arm).

Table 23: Changes in dietary intake and measures of cooking skills and confidence, for those who provided data at both baseline and follow-up only (per protocol (PP) analysis); unless otherwise stated, figures shown are means or proportions. Data is stratified by study arm and is pooled from both dietary assessment methods.†

	<i>Intervention, n=26[#]</i>		<i>Control, n=25[#]</i>	
	Baseline	Follow-up	Baseline	Follow-up
Median (IQR) portions of fruit and veg. per day [^]	3.5 (1.7, 5.3)	2.6 (2.0, 4.6)	2.3 (1.2, 3.0)	2.5 (0.8, 3.7)
% of participants consuming 5-a-day	33.3	22.2	10.3	20.7
Mean (SD) energy intake (kcal/day)	1985.6 (742.5)	1787.6 (462.3)	1715.0 (571.1)	1654.4 (563.3)
Mean (95% CI) NSP intake (g/day)	13.5 (7.1)	12.1 (4.0)	12.4 (7.8)	10.8 (5.8)
Mean (95% CI) salt (g/day)	7.6 (3.2)	6.8 (2.6)	7.6 (2.6)	6.8 (3.0)
% energy from fat	35.4 (5.9)	37.7 (8.4)	36.2 (5.8)	33.5 (7.1)
% energy from saturated fat	11.8 (3.0)	13.3 (4.3)	11.7 (3.5)	11.3 (4.2)
% energy from NMES	11.1 (6.0)	9.7 (5.9)	10.5 (7.0)	13.1 (14.8)
% who reported being confident:				
at being able to cook from basic ingredients	53.9	80.8	56.0	52.0
at following a simple recipe	84.6	88.5	72.0	76.0
at preparing and cooking new foods and recipes	50.0	69.2	28.0	36.0
that what will cook will 'turn out' well	57.7	69.2	32.0	36.0
tasting foods that have not eaten before	53.8	65.1	44.0	40.0
Mean (SD) number of individual techniques reported confident at using ^{\$}	6.4 (1.6)	7.0 (1.2)	6.0 (1.8)	6.0 (1.9)
% who can prepare dish types with no help at all:				
Ready Meal	80.8	92.3	88.0	84.0
Main meal from pre-prepared ingredients	76.9	92.3	64.0	64.0
Main meal from basic ingredients	53.9	76.9	60.0	44.0
Cake or biscuits from basic ingredients	30.8	53.8	24.0	28.0
% who reported that they prepare a main meal:				
from pre-prepared ingredients 4-6 times per week	26.9	26.9	20.0	20.0
from pre-prepared ingredients daily	0.0	0.0	4.0	8.0
from basic ingredients 4-6 times per week	11.5	26.9	16.0	4.0
from basic ingredients daily	3.9	3.9	4.0	8.0

[^] - mean change is shown (not median) between baseline and follow-up; ^{*} - denominator is n minus participants who reported living alone; ^{\$} - Participants were asked to report yes/no as to whether they were confident at using eight cooking techniques (boiling, steaming, frying, stir-frying, grilling, roasting, stewing, microwaving) - the sum of those techniques they reported 'yes' to were summed to give an overall score; [#] - dietary data based on 27 respondents in intervention arm & 29 respondents in control arm (as some participants provided dietary data but did not return their questionnaires); [†] - participants completed either a 3-day food diary, or took part in 3 x 24h recall interviews (see table x for breakdown by study arm)

Social connectedness & nutrition knowledge

Table 24~~Error! Reference source not found.~~ shows the response to questions about social eating behaviours and nutritional knowledge by group allocation at baseline and follow-up. At baseline, between 42% and 50% of participants reporting eating together five or more days a week; between 39% and 68% of participants reported eating in front of the television on five or more nights a week; between 22% and 28% of participants reported eating their evening meal at a dinner table on five or more nights a week. There were large differences between the intervention arm and control arm participants. .

Table 24: Baseline measures of dietary intake, measures of social connectedness, and measures of cooking skills and confidence; unless otherwise stated, figures shown are proportions (%) and 95% confidence intervals. Data is stratified by study arm and analysis type.

	Intervention			Control, n=25		
	Baseline (ITT) n=36	Baseline (PP) n=25	Follow-up (PP) n=25	Baseline (ITT) n=34	Baseline (PP) n=25	Follow-up (PP) n=25
No. and % of participants who reported living alone	5 (13.89)	4 (15.38)	5 (19.23)	3 (8.82)	3 (12.00)	4 (16.00)
% who reported usually:						
eating together at home in the evening 3-4 times per week*	22.6	13.6	9.5	19.4	27.3	28.6
eating together at home in the evening 5+ times per week*	45.2	50.0	57.1	41.9	50.0	47.6
eating their evening meal in front of the TV 3-4 times per week	16.7	15.4	26.9	20.6	12.0	36.0
eating their evening meal in front of the TV 5+ times per week	38.9	38.5	34.6	55.9	68.0	48.0
eating their evening meal at a dinner table 3-4 times per week	19.4	19.2	19.2	11.8	12.0	24.0
eating their evening meal at a dinner table 5+ times per week	22.2	26.9	23.1	26.5	28.0	16.0
Mean (SD) number of correct responses (out of possible 10)	7.1	7.1	7.0	6.6	6.8	6.4
Experts recommend people should be eating more/same/less of:						
Vegetables (more)	97.2	96.2	96.2	88.2	92.0	88.0
Sugary foods (less)	100.0	100.0	96.2	94.1	100.0	88.0
Meat (less)	30.6	34.6	34.6	23.5	24.0	16.0
Starchy foods (more)	16.7	7.7	7.7	11.8	8.0	12.0
Fatty foods (less)	100.0	100.0	96.2	88.2	88.0	92.0
High fibre foods (more)	75.0	76.9	80.8	70.6	76.0	72.0
Fruit (more)	100.0	100.0	88.5	94.1	96.0	80.0
Salty foods (less)	97.2	96.2	92.3	85.3	96.0	76.0
Experts recommend eating how many portions of fruit/vegetable per day:						
>5	13.9	11.5	19.2	17.7	16.0	12.0
5	61.1	61.5	65.4	70.6	76.0	84.0
<5	25.0	26.9	15.4	11.8	8.0	4.0
Saturated fats found mainly in dairy and red meat and meat products	19.4	26.9	19.2	11.8	12.0	20.0

* - denominator is n minus participants who reported living alone; \$ - Participants were asked to report yes/no as to whether they were confident at using eight cooking techniques (boiling, steaming, frying, stir-frying, grilling, roasting, stewing, microwaving) - the sum of those techniques they reported 'yes' to were summed to give an overall score

At baseline, the mean number of correct responses to questions related to healthy eating was between 6.6 and 7.1, out of a possible ten correct responses. The majority of participants correctly identified that guidelines recommend that people eat more fruit and vegetables, and less sugary, fatty and salty foods. However, the findings were more equivocal for knowledge relating to starchy foods, meat and high fibre foods: between approximately 8% and 17% percent of participants correctly identified that more starchy foods should be eaten; between 24% and 35% participants correctly identified that less meat should be eaten; and approximately 75% of participants correctly identified that more high-fibre foods should be eaten.

At least three quarters of participants correctly stated that the recommended number of portions of fruit and vegetables to consume per day was a minimum of five. Between twelve and twenty-seven percent of participants identified that saturated fats are mainly found in meat and dairy products; this varied between study arms.

Health Behaviours

Table 25**Error! Reference source not found.** shows the baseline and follow-up measures of attitudes to health and healthy eating, difficulties faced when trying to eat more healthily, and beliefs around what constitutes a healthy lifestyle and a healthy diet.

At baseline, approximately half of all participants reported that they would probably or definitely increase their FV intake over the next 12 months. However, around the same proportion of participants also said that it was not easy for them make healthy choices in day-to-day life. In the intervention arm, four-fifths of participants reported that they tended to think about their health when deciding what to eat and the same proportion also agreed that the food they eat has an important effect on their health and that to be a healthy person it is necessary to eat a balanced diet. However, between only 56% and 59% of participants in the control arm reported that they tended to think about their health when deciding what to eat, although the proportions were similar to the intervention arm for the other two measures.

A majority of participants agreed that it was interesting to hear stories about healthy eating in the media, that it was easy to find healthy foods in the shops, that it was easy to get information about healthy eating, that they were willing to go out of their way to have a healthy diet, that healthier eating means eating a diet high in fruit and vegetables and that to be a healthy person you have to exercise regularly.

Also included in the beliefs section of the questionnaire were some incorrect statements with which participants were asked to rate their level of agreement. For example, “healthier eating means eating a diet high in fatty foods”. The responses indicate that the majority of participants noticed these and answered accordingly, for example between 14% and 19% agreed that healthier eating means frying foods rather than grilling foods. Participants appeared less confident in responses related to fibre: between 21% and 31% agreed that a healthy diet is low in fibre.

Table 25: Responses provided by participants to questions/statements gauging perceived difficulties in trying to eat healthier, intentions to eat healthier, nutrition self-efficacy, and attitudes to health-related behaviours. Unless otherwise stated, values shown are proportions (%).

	<i>Intervention</i>			<i>Control</i>		
	<i>Baseline (ITT) n=37</i>	<i>Baseline (PP) n=26</i>	<i>Follow-up (PP) n=26</i>	<i>Baseline (ITT) n=35</i>	<i>Baseline (PP) n=29</i>	<i>Follow-up (PP) n=29</i>
	52.8	51.9	42.3	47.1	48.3	68.0
% of participants who agreed (agree or strongly agree) that:						
they tend to think about their health when deciding what to eat	80.6	81.5	84.6	55.9	58.6	56.0
it's interesting to hear about healthy eating in the media	58.3	51.9	61.5	58.8	62.1	60.0
it's easy to find healthy food in the shops	72.2	70.4	84.6	61.8	62.1	68.0
it's easy to get information about healthy eating these days	77.8	77.8	84.6	79.4	82.8	76.0
it's not easy to make healthy choices in day-to-day life	52.8	48.2	38.5	55.9	55.2	44.0
they were willing to go out of their way to have a healthy lifestyle	77.8	77.8	84.6	79.4	82.8	64.0
Median (IQR) number of statements identified as possible difficulties when trying to eat healthier (range 0-22)	6.0 (4.0, 8.0)	6.0 (4.0, 8.0)	6.5 (4.0, 9.0)	6.5 (4.0, 9.0)	6.0 (3.0, 8.5)	6.0 (4.0, 9.0)
Mean (SD) nutrition self-efficacy score (range 5-20, where a higher score indicates higher self-efficacy)	12.6 (3.4)	12.5 (3.3)	12.6 (4.0)	13.5 (3.9)	13.5 (3.9)	12.4 (4.4)
% of participants who agreed (agree or strongly agree) that:						
"The food I eat has an important effect on my health"	83.3	81.5	80.8	82.4	86.2	80.0
"To be a healthy person you have to eat a balanced diet"	86.1	85.2	84.6	85.3	89.7	84.0
"To be a healthy person you have to exercise regularly"	77.8	74.1	76.9	82.4	79.3	84.0
"Healthier eating means eating a diet high in fruit and vegetables"	63.9	59.3	61.5	58.8	58.6	60.0
"Healthier eating means eating a diet high in fatty foods"	8.3	11.1	11.5	5.9	10.3	4.0
"Healthier eating means eating a diet low in sugar"	44.4	48.2	53.9	41.2	44.8	52.0
"Healthier eating means eating a diet low in fibre"	30.6	25.9	11.5	20.6	20.7	20.0
"Healthier eating means frying foods rather than grilling them"	13.9	18.5	3.9	14.7	17.2	16.0

Participants were also asked to identify which difficulties, from a pre-defined list of 22, that they might face if they were to try and eat more healthily. The median number of difficulties that participants identified as relevant to them was between 6 and 6.5. At baseline, the difficulties that were identified by most people as relevant to them were that experts keep changing their mind about what is healthy, their busy lifestyles, limited choices when eating out or buying takeaways, perceived expensiveness of healthy foods, lack of knowledge around healthy eating and cooking

skills, and simply a lack of desire to give up the foods that they liked. A full list of difficulties can be found in Table 26 **Error! Reference source not found..**

Table 26: Frequency of being reported as ‘yes’ (would be a difficulty); number and proportion of times scored as ‘yes’ are shown

	<i>Intervention, n=26</i>			<i>Control, n=25</i>		
	<i>Baseline</i>	<i>Follow-up</i>	<i>% diff.</i>	<i>Baseline</i>	<i>Follow-up</i>	<i>% diff.</i>
Experts keep changing minds about what’s healthy	15 (57.7)	13 (50.0)	-7.7	10 (40.0)	14 (56.0)	16.0
Busy lifestyle	14 (53.8)	16 (61.5)	7.7	13 (52.0)	10 (40.0)	-12.0
Choices limited eating out/at takeaways	14 (53.8)	14 (53.8)	0.0	8 (32.0)	12 (48.0)	16.0
Healthy foods are too expensive	14 (53.8)	11 (42.3)	-11.5	9 (36.0)	13 (52.0)	16.0
Don’t want to give up foods liked	13 (50.0)	11 (42.3)	-7.7	12 (48.0)	12 (48.0)	0.0
Healthy food goes off quicker	11 (42.3)	10 (38.5)	-3.8	7 (28.0)	8 (32.0)	4.0
Irregular work hours	10 (38.5)	14 (53.8)	15.4	7 (28.0)	15 (60.0)	32.0
Don’t know enough about healthy eating	10 (38.5)	5 (19.2)	-19.2	12 (48.0)	12 (48.0)	0.0
Healthy food takes too long to prepare	10 (38.5)	8 (30.8)	-7.7	7 (28.0)	3 (12.0)	-16.0
Don’t have the right cooking skills	9 (34.6)	4 (15.4)	-19.2	13 (52.0)	11 (44.0)	-8.0
Healthy food not available in shops I usually go to	6 (23.1)	10 (38.5)	15.4	6 (24.0)	6 (24.0)	0.0
I lack the willpower	6 (23.1)	11 (42.3)	19.2	12 (48.0)	9 (36.0)	-12.0
Don’t want to change habits	5 (19.2)	8 (30.8)	11.5	2 (8.0)	8 (32.0)	24.0
Too much change from current diet	5 (19.2)	6 (23.1)	3.8	2 (8.0)	3 (12.0)	4.0
Other members of household wouldn’t like it	4 (15.4)	5 (19.2)	3.8	4 (16.0)	6 (24.0)	8.0
Don’t have right equipment to prepare food	4 (15.4)	6 (23.1)	7.7	1 (4.0)	2 (8.0)	4.0
Healthy food awkward to carry home	3 (11.5)	5 (19.2)	7.7	0 (0.0)	2 (8.0)	8.0
Healthy food doesn’t satisfy me	3 (11.5)	4 (15.4)	3.8	5 (20.0)	4 (16.0)	-4.0
Healthy food unappealing	2 (7.7)	5 (19.2)	11.5	5 (20.0)	4 (16.0)	-4.0
Feel conscious eating healthy in front of others	2 (7.7)	3 (11.5)	3.8	5 (20.0)	7 (28.0)	8.0
Limited food storage facilities	2 (7.7)	9 (34.6)	26.9	3 (12.0)	4 (16.0)	4.0

Table 27 **Error! Reference source not found.** lists the influences on food choice that were ranked as ‘very important’ by participants. At baseline, the influences most frequently ranked as very important were quality or freshness of food, price of food, habit or routine, and what the participant’s family, spouse or partner would eat.

Table 27: List of influences on choice of food by rank – ranked by frequency of being scored as ‘5’ (very important); number and proportion of times ranked ‘5’ are shown

	<i>Intervention, n=26</i>			<i>Control, n=25</i>		
	<i>Baseline</i>	<i>Follow-up</i>	<i>% diff.</i>	<i>Baseline</i>	<i>Follow-up</i>	<i>% diff.</i>
Quality or freshness of food	20 (76.9)	13 (50.0)	-26.9	22 (88.0)	17 (68.0)	-20.0
Habit/routine	16 (61.5)	11 (42.3)	-19.2	14 (56.0)	12 (48.0)	-8.0
Price of food	15 (57.7)	14 (53.8)	-3.8	21 (84.0)	16 (64.0)	-20.0
What my family/spouse/partner will eat	14 (53.8)	10 (38.5)	-15.4	12 (48.0)	12 (48.0)	0.0
Trying to eat a healthy diet	10 (38.5)	8 (30.8)	-7.7	10 (40.0)	10 (40.0)	0.0
Taste of food	8 (30.8)	3 (11.5)	-19.2	3 (12.0)	3 (12.0)	0.0
Value for money	8 (30.8)	5 (19.2)	-11.5	8 (32.0)	9 (36.0)	4.0
Convenient to prepare	7 (26.9)	2 (7.7)	-19.2	8 (32.0)	11 (44.0)	12.0
Presentation or packaging	5 (19.2)	7 (26.9)	7.7	5 (20.0)	5 (20.0)	0.0
Slimming/losing weight	4 (15.4)	2 (7.7)	-7.7	2 (8.0)	3 (12.0)	4.0
How much money I have for food	4 (15.4)	4 (15.4)	0.0	7 (28.0)	5 (20.0)	-8.0
Dietary restrictions	3 (11.5)	2 (7.7)	-3.8	1 (4.0)	4 (16.0)	12.0
Health/medical conditions	2 (7.7)	3 (11.5)	3.8	2 (8.0)	3 (12.0)	4.0
Additives, preservatives, colourings	2 (7.7)	4 (15.4)	7.7	10 (40.0)	10 (40.0)	0.0
Cultural, religious or ethical background	1 (3.8)	1 (3.8)	0.0	1 (4.0)	3 (12.0)	8.0
Availability in the shops I go to	1 (3.8)	0 (0.0)	-3.8	0 (0.0)	1 (4.0)	4.0
Recommendations from others	0 (0.0)	0 (0.0)	0.0	0 (0.0)	2 (8.0)	8.0
Advertising	0 (0.0)	0 (0.0)	0.0	1 (4.0)	2 (8.0)	4.0
Knowledge of cooking/food prep.	0 (0.0)	0 (0.0)	0.0	0 (0.0)	1 (4.0)	4.0

3.5. Discussion

The aim of this work package was primarily to assess the feasibility and practicality of the research methods, and to establish the characteristics and baseline cooking skills of those taking part in the intervention.

3.5.1. Summary of principal findings

The pilot study has established that recruiting from the wait-lists of an existing cooking skills intervention is not likely to be feasible for a definitive trial. As we only recruited a small number from the wait-lists, it has not been possible to draw any firm conclusions about whether those from the wait-lists are ‘most-in-need’ of a cooking skills intervention, and whether they differ systematically from community recruits.

Due to the lack of success in recruiting from the wait-lists, our efforts were instead concentrated on recruiting from the community. We successfully piloted a number of strategies, including recruitment through workplaces and community groups, which demonstrated that we could recruit participants with a matching socio-demographic profile of those who had been identified as ‘most-in-need’ in WP1.

A small number of potential participants responded to requests for information about why they had decided not participate. These reasons included not wanting to be randomised to a control group,

inflexible working patterns and other commitments, such as childcare. No reasons were so popular that they would be likely to hinder recruitment for a definitive trial. Approximately one third of participants were lost to follow-up, mainly either because they could not be contacted or they failed to attend any of the course. This also includes participants who did not accept their allocated arm and so were classed as 'dropouts'; this proportion of participants would need to be taken into account when planning a definitive trial. Further efforts will need to be made in a definitive trial to maximise follow-up and to discover reasons for not wishing to continue participation in the trial.

Most participants attended at least three-quarters of the 8 intervention classes, therefore poor attendance would not jeopardise a definitive trial. However, the proportion of participants who attend less than a particular number of sessions (that might be deemed to be sufficient to change behaviour) may need to be taken into account when calculating a sample size for a definitive trial.

The research methods that were piloted were, on the whole, successful in collecting the required data. There were minimal missing data in the questionnaires, and both dietary data collection methods that were piloted did not pose any major challenges, and there appeared to be few differences in the resource intensiveness of the 24-hour recall interviews compared to the 3-day food diaries, although the data suggest that the latter may be slightly more burdensome for participants.

The level of baseline cooking skills of those who were recruited differed from those reported at a population level (in WP1), with participants in our sample reporting, on average, lower levels of confidence at cooking 'from scratch'. This suggests that participants in need of cooking skills can be recruited for a definitive trial.

The dietary data showed that participants in the sample typically had poorer diets than the general population, in terms of fruit and vegetable intake. This information will inform a sample size calculation for a definitive trial.

3.5.2. Strengths and limitations

Strengths

This study successfully managed to recruit participants identified as most likely to be most-in-need of a cooking skills intervention, both in terms of socio-demographic profile and self-reported cooking skills and confidence at baseline. Previous studies of cooking skills interventions have not attempted to target recruitment based upon population-representative data of cooking skills, instead, recruitment has been targeted at self-selecting participants,⁷² students,^{120 121} young mothers,^{17 122} and adults with specific health conditions such as type II diabetes,¹²³⁻¹²⁶ based upon the presumption that these groups may benefit from cooking skills interventions either because they have self-selected or because they belong a socio-demographic group that typically has a poorer diet than the general population. Compared to the quasi-experimental evaluation of the JOMoF programme in Australia,⁷² our pilot trial recruited participants who were more likely to be male, younger, and have a slightly larger household size, which better reflects the socio-demographic characteristics of those who were identified in WP1 as 'most-in-need'.

We also successfully piloted recruitment via a number of different channels, including four different workplaces, three community groups and recruitment via 'open' events that were attended by members of the general public. We therefore have a good indication of which recruitment channels would be most productive in a definitive trial, and which channels may be more likely to reach the target demographics of those 'most-in-need'. These recruitment channels successfully identified a higher proportion of participants potentially in need of a cooking skills intervention than in the general population, and also managed to retain a relatively high number of participants at follow-up compared to other cooking skills interventions.^{10 28}

This pilot study was also conducted in the same settings and locations in which a definitive trial would be located. This has the advantage of the locations being familiar to the research team, the intervention deliverers being familiar with the research aims and its methods, and some of the potential organisations through which recruitment may be conducted already identified.

Limitations

The pilot study did not recruit its target number of 96 participants. This was because two of the sites closed during the research, although one has now reopened. Nonetheless, we were able to respond flexibly and recruit additional participants at one of the other sites. This is arguably both a strength and a limitation, in that it highlights that a definitive trial would have to accept that there will always be a risk that the trial could be disrupted by an event such as a site closure or suspension, but that if that were to happen, there would be a realistic possibility of recruiting additional participants at another site to maintain numbers needed to meet the necessary sample size.

We had also hoped to collect further data on the reasons why people decided not to take part in the study. Whilst some participants did respond to the very brief questionnaires included in the information pack (if they decided not to take part), there were not sufficient responses to develop an in-depth understanding of the reasons why people may choose not to take part. Knowledge of these reasons may have been helpful for refining study methods, and recruitment methods, for a definitive trial, if these were reasons that influenced people's decisions not to take part.

We also had aimed to compare participants from the existing waiting-lists for the JOMoF course with those who we had recruited from the community, to understand whether those who were self-selecting to the course were most in need. However, in practice, this method of recruitment proved not to be feasible. Whilst this has provided us with useful information that will aid in the design of a definitive trial, the small number of wait list recruits means that we are limited in the conclusions we could draw about whether existing participants of cooking skills courses are likely to be those most in need and with capacity to benefit. However, the indications are that wait list participants seem to be a group in less need.

Finally, the pragmatic decision to pilot a follow-up period of 4 weeks rather than 12 months may give an underestimation of the proportion of participants that would be lost to follow-up in a definitive trial with a longer follow-up period. Nevertheless, follow-up was successfully completed in an acceptable proportion of participants yielding data of sufficient quality to permit outcome evaluation.

3.5.3. Interpretations and conclusions

Recruitment

The primary outcomes of this WP were to assess whether a definitive trial would be feasible using the same or similar methods of data collection and study procedures, by assessing factors affecting recruitment, retention and attrition, and practical and methodological issues likely to affect the success of such a definitive trial.

The wait-list recruitment method proved unlikely to be a feasible method, for three reasons: 1) some individuals did not want to risk having to wait 16-20 weeks to be able to do the course; 2) JOMoF centres did not have the resource to forward introduction letters to all participants signing up to courses (which was necessary for data protection purposes); and 3), many participants only signed up to courses last-minute, leaving no time to introduce the research, recruit and collect baseline data.

For these reasons, we conclude that wait-list recruitment would not be possible for a definitive RCT. An evaluation of the JOMoF intervention in Australia used a type of recruitment similar to the wait-list recruitment, and did have a comparison arm. However, that study was a quasi-experimental design that did not include randomisation, rather participants were allocated to the comparison arm if they signed up to a course with more than ten weeks to go before the start date of the course.⁵⁶

We therefore piloted a number of community recruitment strategies, including recruiting participants through workplaces and community groups. The mean recruitment rate was approximately 18%; this is the percentage of those people who were aware of the intention to recruit to the research, thus the denominator includes an estimate of the numbers of people in workplaces who were present when we were there to recruit but who may not have attended the recruitment event that was taking place. Reports of recruitment rates in other studies suggest that such rates are typically quite variable, and depend upon the context of recruitment and type of intervention being recruited to; no 'acceptable' rate of recruitment has been defined for this type of study.^{127 128}

The recruitment success in the pilot study varied, with the most successful method being through community groups. In these cases, there appeared to be a peer influence, in that once one individual had signed up, others followed suit. Other studies have reported on the challenges of recruitment and elements of successful recruitment strategies,^{129 130} particularly for men, who may not be as easy to engage.¹³¹ For recruitment to randomised controlled trials, typically giving information about the health problem or more information about the condition has been shown to increase rates of recruitment, as can the provision of monetary incentives.^{132 133} However, these findings are based on clinical studies, and therefore may not be applicable to non-clinical studies such as this. Evidence suggests that culturally tailored recruitment may be more effective, such as matching the recruiter by sex, age or ethnicity, or tailoring the recruitment to settings that are likely to be of salience for the target demographic, such as was demonstrated in a physical activity study that recruited male participants through large football clubs.^{132 134} Such studies have also recruited participants to groups, many of whom are known to each other. This appeared to have advantages for recruitment and retention in our study, but may have implications for group allocation and sample size in a definitive trial.

Data from the qualitative part of the study suggests that better explanation of the concept of randomisation may be necessary for some participants.¹³⁵

In a definitive trial, tailored and targeted recruitment will be of particular importance, and careful thought will need to be given for how best to recruit large numbers of those identified as ‘most in need’ of a cooking skills intervention, as blanket recruitment, for example using mass-media or mailings, have been shown to be typically more successful at attracting an older and less deprived demographic, which a definitive trial of a cooking skills intervention would not be seeking to do.¹³⁶

137

Randomisation

A key aspect of a definitive trial will be the successful randomisation of participants to either an intervention arm or a control arm. In this pilot study, we simulated this by randomising participants to either received the intervention straight away or wait between 16 and 20 weeks. However, in a definitive trial, participants would most likely be asked to wait up to 52 weeks.

As the method of wait-list recruitment has been deemed to not be feasible for a definitive trial, the issue of the acceptability of randomisation is only relevant to those recruited from the community. In total, there were three participants who were allocated to the control arm who did not accept this and went on to do the course without waiting 16-20 weeks, equivalent to 8.5% of all participants in this arm who had provided baseline data. However, two participants in the intervention arm also rejected their allocation. Neither of these rates would mean that randomisation in a definitive trial would not be possible. However, consideration needs to be given to the longer period that participants would be being asked to wait in a definitive trial, which could increase the numbers of participants rejecting their allocated arm.

Previous studies have found that participants find the idea of randomisation a disincentive to participation.^{17 56} However, the qualitative results from our pilot study suggest that, on the whole, if it is explained adequately, including an emphasis on the role of chance in determining whether participants have to wait to take part, then it is accepted by participants. Nonetheless, there is always likely to be a small proportion of participants who then decide that their allocated arm is unacceptable, and request to change. There is arguably a higher risk of this in a definitive trial if participants were asked to wait for up to 12 months. In the pilot study, participants were still permitted to take the course at no cost to themselves, but were classed as having dropped out. In a definitive trial, consideration may need to be given to withholding course payment for those who refuse their allocated arm, to prevent participants from taking part only to receive a free course, with no intention to wait 12 months if allocated to the control arm.

Alternatively, we need to consider whether a waiting list control is necessary at all, given that we would be unlikely to recruit from JOMoF waiting lists in a definitive trial. Community recruits could be randomised to receive the intervention or a comparator condition which does not contain the active ingredients of the JOMoF course. This control condition could, for example, be a cooking skills booklet or an online course. A more elaborate and costly, but less practical and less acceptable alternative would be an eight week course on something other than cooking skills.

Retention & attendance

The study retained slightly more participants than predicted, with a retention rate of 69.4% (95% CI 57.5, 79.8). We had estimated a retention rate of approximately 65%. The most common reason for loss to follow-up was no response to contact when arranging to collect follow-up data. This level of

retention compares favourably with other, similar interventions. A pre- and post-test evaluation of a cooking skills programme in Scotland achieved a follow-up at 1 year of 43%,¹²² while an evaluation of the Australian Ministry of Food programme achieved a follow-up rate of 31% in its intervention arm at 6-month follow-up.²⁹ Another study of a cooking skills course in Scotland achieved a follow-up rate of 44% at two months, and 36% at six months.¹⁷ All of these evaluations were also conducted with typically more deprived individuals, but had different study designs to that piloted here, so direct comparison of rates is problematic.

On the whole, attendance was good, with an average of 7 out of 8 intervention sessions attended by participants. There were various reasons for participants missing sessions, including illness, childcare commitments, transport issues and a clash between class time and work commitments, the latter applicable mainly to those who worked variable shift patterns. The study of the JOMoF programme in Australia, and one of those conducted in Scotland, did not report on attendance so it is not possible to make direct comparisons.^{17 72} However, one study conducted in Scotland briefly commented that the majority of participants in their study attended at least four intervention sessions, although courses varied between four and eight weeks, depending on the wishes of the participants.¹²²

Systematic review evidence of strategies to improve retention in randomised studies suggests that provision of monetary incentives may improve retention.¹³⁸ In our pilot study, monetary incentives were given for completion of data collection tasks, and the course was provided free-of-charge (normally a small fee is payable – usually approximately £5 per week, or £40 for the entire course). Whilst providing a form of banked incentive for each class attended, rather than for completion of data collection tasks, might be a possibility for a definitive trial, consideration would have to be given to the ethical implications of doing this, administration of such a method, and also the fact that this would not accurately mirror how the intervention would occur in ‘real-life’ settings. Given that our aim in conducting a definitive trial would be to determine the effectiveness of the intervention under conditions as close to ‘real life’ as possible, the issue of incentive payments will need careful consideration.

Acceptability of data collection methods

Two dietary data collection methods were piloted – 24-hour recalls and 3-day food diaries – to establish a preferred method for a definitive trial. It was anticipated that there may be some literacy issues with participants completing 3-day food diaries, but this was not evident. There were also no marked differences in the amount of missing days of data between methods. The data suggest that the 24-hour recall interviews may be slightly more resource-intensive for the research team, arguably because of the need for repeat phone calls, often at unsociable hours. However, the participant interviews suggested that some participants completing food diaries were more prone to omitting items, often because they forgot to keep the diary with them and complete it throughout the day. Participants only provided data via one method, not both, and so it has not been possible to compare the two methods like-for-like in terms of accuracy of dietary data and participant preference. Both of these methods contain an element of burden to participants, although the data suggest the food diary method may be more burdensome, in terms of time, than the 24-hour recall method. Other studies have found similar results, but recommendations normally err towards the selection of 24-hour recalls over food diaries, because of the perception that data may be slightly

more accurate, and the avoidance of problems with literacy issues if and when these occur.¹³⁹⁻¹⁴² Based on these data, it appears that the 24-hour recall method is arguably superior to the food diary method, primarily because it reduces participant burden and helps to overcome any literacy issues should they arise. However, if this method were to be selected for use in a definitive trial, consideration would need to be given to how the response rate to telephone recalls might be improved, and the workload eased slightly for the researcher.

The questionnaire that was piloted was well received by participants and levels of completion were good. The qualitative interviews did not reveal any particular issues or concerns with completion of the questionnaire, nor did any participants mention, during home visits, a desire to not answer particular questions, suggesting that the questionnaire as piloted is likely to be suitable for use in a definitive trial.

Cooking skills

The baseline self-reported cooking skills of the pilot study participants demonstrate that the recruitment strategy was effective at targeting recruitment at individuals with cooking skills poorer than those found in the general population. In the pilot study, between 52% and 63% of participants reported being confident at preparing a main meal from basic ingredients, and between 50% and 66% reported being confident at preparing a main meal from pre-prepared ingredients; the findings from WP1 suggest that these proportions, at population level, are approximately 93% for both types of meal preparation.

In the pilot study, between 11% and 25% reported that they prepared a main meal from scratch between four and six times a week. The data from NDNS found that, nationally, around two thirds of people reported that they cooked a main meal from scratch at least five days a week.

Dietary intake

The median number of portions of fruit and vegetables consumed by participants was between 2.6 and 2.9 at baseline, lower than the UK average intake for adults, which is currently estimated to be 4.1 portions a day. The proportion of UK adults meeting the 5-a-day guidelines is 31%. In the pilot study, between 19% and 25% of adults were estimated to be meeting these guidelines.¹⁴³

These data suggest that the diets of participants recruited to the study were typically poorer than the average diet of adults in the UK. Therefore, in terms of recruitment for a definitive trial, a recruitment strategy that seeks to target a similar demographic profile of participants would be likely to recruit participants who may benefit from taking part in a cooking skills intervention, if indeed cooking skills interventions prove to be effective at improving diet.

3.6. Conclusion

The findings suggest that a definitive study of a cooking skills interventions is feasible, using community recruitment, randomisation to a wait-list control group and collection of data using questionnaires and food diaries or 24-hour recalls. However, retention of participants in a 12-month waiting list control group may not be as successful at retaining participants as in this pilot study. An alternative control condition would be worth exploring prior to a definitive trial.

As a definitive trial would seek to collect detailed data on diet and other factors potentially related to the outcome of interest in a larger number of participants than in the pilot study, the resource requirements of data collection, and burden on participants, would also be increased. This would need to be taken into account when planning a definitive trial, and ways in which either resource requirements or participant burden could be reduced should be explored.

It has been established that the identification and recruitment of people 'in need' of cooking skills interventions is possible, using recruitment strategies formulated to target particular socio-demographic groups. Any such recruitment strategy must involve close engagement with intervention stakeholders and gatekeepers of organisations from which participants may be recruited. Indeed, a definitive trial itself would also need the support and co-operation of intervention stakeholders for it to be successful, something which seems likely based on our experience of conducting the pilot study.

3.6.1. Implications for future research

This work has shown that, despite the methodological limitations of previous studies in evaluating cooking skills interventions, a definitive RCT should be feasible. These findings may also be applicable to similar types of intervention that researchers and public health practitioners may want to evaluate.

Any future evaluations of cooking skills, or similar interventions, should seek to explore the baseline skills or confidence levels of the behaviour of interest, in order to determine whether the intervention is targeted at those 'most in need', or whether the intervention requires refinement in order to maximise the potential effect size. Any research in this area should also seek to collect more detailed and robust dietary data, rather than relying on simple self-report measures as previous studies have done.^{72 122} This should help to build a more rigorous evidence base in support of the hypothesis that cooking skills interventions have the potential to improve diet.

4. Work package 3 – qualitative study

4.1. Background

Qualitative research was conducted with intervention participants and stakeholders to explore the feasibility and acceptability of the intervention and research methods, and to explore factors influencing successful implementation of the intervention and research methods, and engagement in both. The qualitative research provides depth and explanation to complement the quantitative findings. Three exercises were conducted:

- Individual interviews with cooking skills intervention participants
- Focus groups with cooking skills intervention participants
- Individual interviews with cooking skills intervention stakeholders

Individual interviews were selected as a data collection method in order to explore potentially sensitive issues around diet that participants may not feel comfortable discussing in a focus group environment, whilst focus groups were selected in order to explore more general issues where eliciting a range of opinions and assessing degree of consensus was required. Originally it had been envisaged that the focus groups would explore views and experiences of participating in the study and the cooking skills course, while the interviews would attempt to explore in more detail individuals' motivations for participating and whether or how they had been able to incorporate learning from the course into their cooking practices at home. However, in practice, both types of interview method covered both sets of topics, although we were able to explore potential impacts on cooking at home in more depth in the individual interviews.

4.2. Aims and objectives

The purpose of the process evaluation is to explore two themes:

- a. The feasibility and acceptability of the intervention and research methods
- b. The factors influencing successful implementation of the intervention and research.

4.3. Methods

4.3.1. Recruitment for qualitative study

Study participants

Participants who had consented to being contacted about this part of the study were purposively sampled to achieve maximum variation with respect to sex, age, socio-demographic classification, interim engagement (as assessed by course facilitators) and course completion (using information provided to us by course facilitators). Participants who agreed to participate in interviews were not selected to also take part in focus groups, to prevent sample bias occurring.

For all participants, we provided an information sheet, by post, for those individuals who expressed a desire to still take part when contacted. This was followed up by a telephone call from a researcher to ask the participant, after considering the information sheet, whether they would like to take part and, if they did, to arrange a suitable time and location for the interview or focus group. Consent was obtained from each participant at the start for the interview or focus group to be audio-recorded.

Stakeholders

Key stakeholders of the cooking skills intervention were identified during informal discussions with JOMoF. We then purposively selected participants to include stakeholders at JOMoF headquarters, project managers and course facilitators at the six intervention sites, local funders of the six delivery sites, and local authority health improvement workers. Once we had identified suitable candidates, we made contact, by email or telephone, to ask if they would be willing to taking part. If individuals expressed an interest in taking part, they were sent an information leaflet. If, after considering the information leaflet, they still wanted to take part, a suitable date and time was arranged for the interview.

4.3.2. Achieved sample

Ten individual interviews were completed with participants (nine face to face in participants' homes and one by telephone): two each from two of the study areas, and three each from the other two study areas. The interview sample comprised five females and five males.

Five focus groups were conducted, three with participants in one of the study areas, and one each with participants from two of the other study areas. Although it had been intended that each focus group would comprise 6-7 participants, it proved difficult to recruit this many participants, and the group sizes ranged from 2-5 (19 participants in total, 13 of whom were male and 6 female). Focus groups were conducted in community venues, and in one instance, in the cooking skills venue.

Six stakeholder interviews were conducted, three by telephone and three face-to-face at stakeholders' own workplace. The stakeholders represented three of the study areas and Jamie's Food Foundation.

4.3.3. Analysis

Interviews and focus groups were transcribed prior to analysis. Analysis of interview transcripts was guided by the Framework approach,¹⁴⁴ which aims to create a hierarchical framework of summarised themes. In this approach, concepts and themes by which the data can be analysed are drawn from both the study objectives and from the data, identified by reading the data post-transcription. Individual concepts in the data are then highlighted and coded before being grouped together under common themes in a series of matrices created for each theme with individual concepts contained within. These matrices are then used to explore relationships between themes and contexts of themes. In this study, each transcript was read several times by two of the researchers in order to generate an initial list of concepts and themes, and a draft coding frame was produced. This was then piloted by each researcher independently on two transcripts. The researchers then met to discuss the results of the piloting, and to refine the coding frame. The remaining transcripts were then coded for framework analysis. Verbatim anonymous quotes are used in the report to illustrate findings.

4.4. Results

4.4.1. Study participants' experiences and attitudes to cooking, diet, food, and food shopping

Participants in the focus groups and interviews were asked to describe their feelings about cooking and the types of cooking they had typically done before attending the cooking course. Findings on this theme are presented below under the following headings: general feelings about cooking;

amount and nature of cooking at home; confidence and skills; use of and attitudes towards recipes; food shopping; diet; barriers and factors affecting cooking; how participants learned to cook.

General feelings about cooking

By definition, the participants who were interviewed could be said to have some existing interest in cooking because they had volunteered to take part in a cooking course (someone with no interest would likely not have volunteered for the study in the first place). Nonetheless, participants differed in their feelings about cooking and their motives for doing it. For some, it was a necessary and sometimes boring task which they wanted to make easier or more interesting, while others described it as something they “loved” [Participant interview F, male] and did a lot of, or a key weekend leisure activity.

A range of potential benefits from cooking were recognised by the course participants, including cost effectiveness and saving money; relaxation; and knowledge of the food consumed - thereby avoiding, for example, hidden preservatives:

“Mainly, the reason why I eat in and cook is, one, is yes, it’s cost effective. Yes. And also you know what you’re eating because you’re the one that’s preparing and you know what you’re putting in. There will be no, you know, preservative or all that things, which is not good for your health. So you’ll be the one doing that, everything, and also, for me, cooking is more like a, after my meal – I work in a bank so I have a stressful environment – so I finish my work and come back home, it’s a kind of a de-stressing exercise, I would say... I just de-stress myself, cook everything, you know, nicely and then, you know, enjoy it.” (Participant interview I, male).

Others had previous experience of cooking and described themselves as enjoying it, but felt that their pleasure in it could be increased if they acquired more confidence to become more adventurous:

“I’ve always enjoyed cooking and baking, I mean we’ve been baking this morning, haven’t we – but I wasn’t really confident in how to put things together and to try things.” (Participant interview D, female)

Amount and nature of cooking at home

Prior to undertaking the cookery training, course participants varied greatly in their cooking habits. At one extreme, participants were consuming microwave meals only, whilst at the other, they described a wide selection of dishes which they prepared regularly.

For some participants, prior to the cookery course their meal preparation involved the use of shortcuts such as ready-made sauces, ready meals, and ‘cook in the bag’:

“...like I say I do quite a lot of cooking from scratch but there is certain things that you just go and buy a jar because it’s easier.” (Focus group B, mixed)

A few participants had previously relied on family members to cook for them, and found themselves having to fend for themselves when circumstances changed. For one older male participant this was when his wife moved into a residential home, while for a younger male participant it was when his mother, with whom he had lived, had died:

“Well, my wife is now in a nursing home. She’s got Alzheimer’s so she was the cook and all of a sudden the carpet’s been taken away from underneath you....” (Focus group A, males).

“With me though, it was overnight, cos my Mother had a heart attack and they said that she’d recover – a week later she was dead. So basically, overnight, I had to look after myself” (Focus group A, males).

These and some other participants who lived alone described sometimes having low motivation to prepare food for one, and relying instead on ready meals or simple convenience food. A view was also expressed that takeaways were easy and cheap, and therefore a better choice than cooking at home:

“...that’s what our Kim does, she just orders take away because it’s easier, it’s cooked and it’s cheaper.” (Focus group D, mixed)

Work activities also had an impact on cooking behaviour, with speed and simplicity important on returning home in the evenings:

“When I get home from work, it’s just easy to just bang something in the oven or in the microwave” (Participant interview A, female)

Leisure pursuits also influenced food preparation practices, with cooking and eating needing to fit around hobbies such as watching football matches.

Some course participants described consuming the same foods regularly as tedious, and experienced pleasure in experimenting with cookery, particularly when there was more time available:

“I suppose the weekend is really the time where you change. You think, ‘Well, what shall we have?’” (Focus group A, males)

“...if you stick with the same things it gets boring and you get put off.” (Participant interview F, male)

One participant even mentioned having theme nights which enabled him and his family to try out new foods and drinks. However, at other times, because of work patterns, he appeared to do little cooking.

Planning was also an important factor, for example scheduling meals for the week prior to going food shopping, and looking up recipes online:

“...when I go for weekly shopping, I have things in my mind, what I will be cooking for Monday, Tuesday, Wednesday...” (Participant interview H, female)

Confidence and skills

A broad range of levels of confidence in cooking and preparing meals prior to the course was observed amongst the participants. Some described themselves as competent cooks, familiar with ingredients and utensils, who found cooking rewarding. It was noted that willingness to experiment with cooking usually grows with levels of confidence, over time. However, some of the participants felt set in their ways and were lacking in self-assurance in food preparation:

“I just get a bit scared of messing up, I guess.” (Participant interview A, female)

“Made a curry from scratch [before the course] - I wouldn’t have dared. I wouldn’t even know where to start.” (Participant interview D, female)

Certain participants stated that they were aware they possessed food preparation skills, but the time-saving benefits of shortcuts were appreciated:

“You can do fresh using your ginger and stuff like that but it, you know, it’s three times the length of cooking something and so really it’s easier to get a paste.” (Focus group E, males)

“So, but at other times, it’s a case of throwing stuff in a slow cooker. That hides a multitude of sins as well, you know.” (Focus group E, males)

One course participant who had relied on his mother to cook for him while she had been alive verbalised a gendered assumption regarding cooking skills:

“And there was a girl next to him who couldn’t crack an egg either, to be quite frank, and there’s me, on my own, never been shown, and I did it. I couldn’t believe it – a girl not being able to do it.” (Focus group A, males)

More confident and experienced cooks described using recipes and cook books, particularly when more time was available for cooking, or to provide reassurance when preparing dishes:

“You make a mistake the first time, you learn from your, but, like I say, if you do a recipe properly, I mean we always used – what do they call her? The Norwich. Delia Smith? Aye. I mean, Shirley used to say that was the Bible you know. If you get it right, you’ll not make a mistake you know, if you do it properly, you’ll not make a mistake.” (Focus group A, males)

“On my long weekends when I get six days off I tend to have a look and see maybe in a food book or something like that and maybe go and get the ingredients and make something for us.” (Participant interview E, male)

Food shopping

Course participants reported a range of attitudes and approaches to food shopping. Some people used a supermarket, and bought items on special offer. Others preferred to use smaller local specialist shops, such as a greengrocer and a butcher:

“I would never go to a supermarket. Aye. I like to get the, sort of, if you like, the best quality I can afford type of thing, you know. Me eggs come from the farm and that, you know.” (Focus group E, males)

Contrasting opinions were also expressed regarding paying attention to food purchases and checking the healthiness or welfare quality of goods. While some participants described their approach as “I just throw it in [i.e. without looking at the label]” (Participant interview A, female), others described themselves as “scrutinisers”, such as one male participant who described how he routinely paid close attention to information on country of origin and meat content, to the extent of writing to retailers and producers to point out apparent n their labelling claims.

Several participants described their prioritisation of health when shopping for food and cooking:

“When it comes to health, nothing is greater than our health so we do cheap and best but, at the same time, no, I don’t compromise in getting the stuff which is healthy.” (Participant interview H, female)

“...later on, it gave me a kind of understanding and I realise that, ‘What am I doing all this for?’ Yeah, at the end of the day, if I’m not healthy, if I’m not living, all this.” (Participant interview H, female)

For some people, the price of goods was not a key factor in food shopping, and other strategies were used to maximise value:

“I try not to make any waste or anything, so the price and the value of things isn’t an issue because I make sure I eat everything.” (Participant interview C, female)

For others, cost was very important and dictated the choice of purchases:

“...it’s whatever is on offer in the supermarkets, like we were in Sainsbury’s the other week and there was this whole salmon for seven pounds. And that has lasted me nearly two months like, I’ve still got some left it was huge. So yeah, I like to find, get some good bargains.” (Participant interview F, male)

“I just buy own labels, me, as well. They’re cheaper. I mean, from Morrisons, you can get a can of creamed rice pudding for 15p. Which is nowt, is it?” (Focus group A, males)

Regarding the choice of foods available to buy in shops, some participants mentioned the benefits of seasonal produce, but that awareness of seasonality had decreased over time:

“And if you could try and go for your seasonal foods, you can get it. Ah but how many people know – I mean, I don’t know now, the seasons as such. I mean, you can, you’ve got a good idea cos of the price, but a lot of people just, you go by price don’t you, yeah.” (Focus group E, males)

The increased availability of year-round produce was seen to be both a benefit, and potentially a disadvantage:

“We can kind of eat anything whenever we want, can’t we, now? Well there was never the availability. In my time – I’m in me 40s – but the availability when I was young was nothing. You would have Prestos and it was very limited. Very, very limited. And now it’s everything whenever you want it really. It is. Yeah. It’s kind of good in some ways but, like you say, in other ways it’s kinda made it harder for people to understand. In some ways it’s too much choice and there’s too much of it goes into cooking where, you know, the basics are good. It frightens people. It does.” (Focus group E, males)

One participant noted the importance of local produce:

“I once took a ready meal back to Asda because the chicken was from Vietnam or something. I’ve nothing against Vietnam – I mean, I’d go there on my holidays probably – but I want to see local chicken in my produce. And if you’re not happy with the product, you can take it back and get your money back. And I think people should be more demanding. So these things are quite important to you.” (Focus group A, males)

Attitudes towards healthy eating

As noted above in relation to attitudes towards cooking, this group of participants could be said to already have some interest in diet and healthy eating by virtue of their having agreed to participate in the study. Nevertheless, the extent of their interest and motivation to eat healthily still varied. For some, comments such as “rabbit food” and “salads” (Focus group D, mixed) suggested a suspicion that healthy eating would be dull and tasteless, or a limited ability to imagine alternatives.

“It’s like you are being told just eat healthy, it’s like well what am I supposed to eat salads every day and you get bored of it” (Focus group D, mixed)

Several course participants described their attempts to consume a healthy diet, and the factors that helped and hindered their efforts. For example, some opted to eat the healthy foods that they preferred:

“I do try to eat healthy food. I don’t like vegetables but I just put in fruit instead.” (Focus group D, mixed)

Others tried to adopt healthier food preparation practices:

“Yeah, these days everywhere people are talking about healthy diet, eating healthy and all that, so I keep that also in my mind, yeah, maybe when I’m cooking, like, use less salt and

maybe, if I'm cooking, I cook in... carbohydrates, yeah? Like rice, I cook less." (Participant interview H, female)

The potential benefits of eating in moderation were also noted:

"Yeah I think so, just a bit of everything you know and I try not to deny myself or the kids of anything you know. We don't overindulge on things as well you know it's trying to have that good balance of a bit of everything whether it's good or bad again and not to over indulge I think that's the key to it for us anyway." (Participant interview C, female)

The importance of dietary variety was identified, both in terms of the desire to consume nutritious meals rather than junk food, and the potential for healthy meals to become boring:

"I mean you can get sick to death of eating burgers and beans, can't you? You get sick to death of eating them. You want something better don't you? Something healthier." (Focus group A, males)

Working practices were found to be a key factor influencing dietary patterns. Many course participants found they were lacking in time and energy after a day at work, and this impacted on their enthusiasm and ability to cook. During the working day, it was difficult for some to have a proper meal:

"I kind of pick at food which obviously isn't good because if you have little nibbles it all adds up at the end of the day." (Participant interview F, male)

"Yeah well they used to have a canteen, so drivers could get proper food, but they got rid of it so it's vending machines and it's sandwiches that have come from hospitals." (Participant interview F, male)

Having a regular eating routine and consuming nutritious foods was particularly difficult for shift workers:

"I sometimes struggle. I find the change of the shifts, going from earlies to lates and days in between, it can be hard. It depends a lot on what sort of sleep I get as well... You know sometimes I feel alright. Other times, you know, you come home and I can't be bothered to do much." (Focus group E, males)

"Because I tend to work earlies and that is me getting up at the earliest at about three in the morning, and my shifts could finish at say eleven in the morning. So you've still got the whole day to go and yet you have been up at three, had breakfast and sort of my break is my lunch and then it finishes really at supper time, yet it's only eleven in the morning you know." (Participant interview F, male)

“And you tend to, say you do a week of earlies, you will have one day off and then go on a week of lates or the other way around, it does make it hard to have a set sort of diet.” (Participant interview F, male)

One approach taken to maintain a more nourishing diet and reduce temptation was to avoid having excess amounts of food available, and to stick to healthier snacks:

“So I tend to try to minimise that by just taking cereal bars and have that with a coffee on my break and a glass of water. And then at least I know that I haven’t had a lot of food at work so when I come home I can still have like a meal and I am not pushing the boundaries calories-wise or anything like that.” (Participant Interview F, male)

“I always bring me own food in. Always. Uh huh. I try to. I mean I, today I know I’m only going to eat on me morning break so I’ve just got porridge there, you know. Help myself to porridge. I’ve got emergency supplies of Weetabix and stuff like that.” (Focus Group E, males)

Barriers and factors affecting cooking

The factors influencing home food preparation behaviour were found to be similar to those affecting dietary intake. Potential difficulties in cooking for only one person were recognised by course participants, particularly in terms of cost-effectiveness, and low levels of motivation:

“I do know how to cook a joint though. I do. Twenty per pound plus twenty minutes. I can do that. The reason I don’t is, with living on my own, I’d have to buy a small joint of food and I don’t like eating cold meat if there’s any left over. So I’d just throw it away. It would be a waste of money for me, would that. It’s difficult when you’re cooking for one, isn’t it? Well I mean, if you’ve more somebody to cook for, then it’s better. But just doing it for yourself, that’s different.” (Focus group A, males)

“Thing is though, wi’ me, being on my own, you know, they don’t do many recipes for just one person. No but you half them don’t you? You half the recipe. Cut it in half. If it’s a meal for two, just make half the ingredients. Mm. Wi’ me, being on me own, it’s just being bothered. Or if not, do it that way and put it in the freezer an’ use it again.” (Focus group A, males)

Some households struggled to find dishes that everyone would consume, especially if members of the family had entrenched eating habits or children were very selective eaters:

“But it depends on what your kids are like though because mine is a fussy child, he won’t eat, he is really fussy, he won’t eat it, he will have chicken nuggets and fish fingers and all that processed stuff.” (Focus group D, mixed)

“...it’s difficult with my mum because she is set in her ways you know and she is not going to have me telling her she should eat this and she should eat.” (Participant interview B, male)

Other families appreciated that their children were open to wide dietary variety:

“Oh, it’s unbelievable what they’ll eat and what, they’ll try everything and anything. Foods I won’t try, they’ll try.” (Focus group E, males)

“...they will at least try it and if they don’t like it then it doesn’t matter because they have tried it. In my view I have kind of praised the fact that they have tried it rather than the fact that they don’t like it at least they have tried it so that’s important.” (Participant Interview C, female)

Many of the course participants described the importance placed on eating together. This was sometimes a challenge, due to different work and leisure schedules:

“Yeah. Through the week it’s very, very ‘ard. On’t weekend, we always try on a Sunday to try an’ all ‘ave us dinner together. When we’re all in, we do try an’ eat together, don’t we Andrew? We try an’ eat together. Like I say, we use table an’ things like that. But, like, sometimes through’t week, we’re all that busy on a night that.” (Participant interview D, female)

“Yeah. Like, maybe, like, one of them’ll come in, ‘ave their tea an’ I’ll be somewhere wi’ ‘im an’, d’you know, so it’s like shifts. Like, tonight, they’ll be summat left in’t slow cooker for oldest two an’ then they’ll come in an’ get theirs, then we’ll come back. So, I do try and... So you all eat the same thing but not necessarily together.” (Participant Interview D, female).

However, for some households sharing mealtimes was a great priority, and an opportunity for valuable social exchange:

“We’ll always sit down together. We never, ever, ever eat in front of the telly. Never. Never have and never will. It’s the social thing, you know – ‘How’s your day been?’ We always have a ‘best bits’, ‘worst bits of the day’. The kids tell you what they’ve done at school and stuff like that.” (Focus group E, males)

The price of food was noted to have an impact on food preparation practices, both negatively in terms of financial outlay, and positively in view of the potential for cost savings:

“I think they are quite happy to until they realise that they have to pay for it and then the enthusiasm wears a little bit doesn’t it, for some people.” (Focus group B, mixed)

“Yeah, so you can save money as well by cooking things from scratch and things.” (Participant interview I, male)

It was also recognised that money could be used as an invalid excuse for eating habits. In the following exchange, one participant took issue with the assumption that healthy eating costs more:

““Healthy foods are too expensive’, which is nonsense.”

Moderator: "Why d'you say that?"
"It's veg. You go to Lidl. It's buttons – it is, you know – it's 29p for a cucumber. You know what I mean? Peppers are 40-odd pence each. They've got the Hot Price Sunday where you get your veg – vine tomatoes are half price and you know what you can do with a tomato." (Focus group E, males)

How participants learned to cook

A large number of participants remarked that they had received no formal teaching in cookery prior to embarking on the cooking course:

"Cos you normally think, I mean, you normally think that most women can cook. I mean, when I was at school, the girls did cookery but the guys did woodwork an' I wish they'd have had cookery at our school..."

"It would have helped me a great deal. Well it would have helped me a great deal in life cos I, you know, as I say, I've had to learn it all on me own. It would have been nice." (Focus group A, males)

For some, this meant learning to cook by trial and error, with growing adventurousness and confidence over time:

"That's it. If you follow the label".

"Yeah. And then you advance, I think, then, don't you?"

"You do".

"To sort of cooking potatoes. Then you start maybe using spices, you know, making curries and chillis and things like that." (Focus group A, males)

Many of the participants noted that watching more competent cooks, particularly other family members, enabled them to pick up new skills:

Moderator: "How did you learn to cook then, if you don't learn at school?"

"Well, you just pick it up – you watch, don't you?"

"You pick it up as you go along, don't you?"

"I mean, my wife was a good cook. We could have dinner parties and they were excellent but – I was the sous chef – I could do that, you know, cut the vegetables and do this, that and the other".

"But she was masterminding it?"

"Aye, without a doubt." (Focus group A, males)

"No, because we don't even learn it but with observation. Observation. Mums, mother-in-laws and we get it. It's just like in the genes, you know, we don't need to have a training for it and that. Observation – we pick it up." (Participant interview H, female)

Some participants felt they had received cookery teaching from relatives, which was perceived as a positive experience:

Moderator: “Did you grow up kind of cooking? Did your Mum teach you to cook?”
“Yeah. It were me dad who used to cook a lot cos my Mum worked full-time. Me Dad worked full-time but they did, like, different shifts so, like, me Dad’d show us how to make a stir fry out of, like – we used to go shopping on a Saturday when I were younger, so Friday night wor empty cupboards night so we used to just put everything in this pan and just cook it up! An’ it were like, using all’t odds and ends before we went shopping!” (Participant interview D, female)

Amongst course participants who had undergone some form of training in cooking, a broad range of experience was observed, from receiving teaching in school, to courses on international cuisine. Cooking at school was generally seen to be at a basic level, and poorly recalled:

Moderator: “D’you remember learning cooking at school?”
“I think for us it were like, sort of like, mixed in with ‘ome economics an’ stuff like that. But not really an’ owt we did, it were just basic stuff like buns, stuff like that.” (Focus group A, males)

“I did it from Year 8 to Year 9 but then, when I got to my GCSEs, it just, I didn’t do it so I hadn’t cooked since then. So, now that I’m 19, it’s obviously gone from my memory now. Can’t remember what we cooked at all.” (Participant interview A, female)

Other more advanced training included a one day Betty’s cookery course; a Thai cooking school in Thailand; and a six week Indian cookery course. Some of these had led to the acquisition of new skills:

“I’ve done, years and years ago I done a cooking of the world course, at another education place, and I sort of got used to the cutting techniques and things with that.” (Participant interview E, male)

4.4.2. Attitudes towards and acceptability of cooking skills interventions

In this section we discuss the following themes: general feelings about the course, views on the course length and format, views on the teaching approach, views on the course facilitators, the skill levels of other participants and any effect this had on the course, and any suggestions for improvements. These are discussed from the viewpoints of both participants and stakeholders separately.

4.4.2.1. Participants’ perspective

General feelings about the course

In general, the participants stated that they enjoyed taking part in the course, with many reporting how much they learned throughout as one of the most satisfying aspects of the course:

“It was just nice just to do maybe something that I hadn’t, I might have cooked them before but maybe to get a different spin or something or different ingredients or something like that so no, I quite enjoyed it” (Participant interview E, male)

"I always wanted to join these kind of cooking classes....I thoroughly enjoyed it" [Participant interview I, male].

Several participants mentioned that it had encouraged them to step out of their comfort zone and experience something different which they normally wouldn't have signed up for:

"I enjoyed it me, it were just something different" (Focus group D, mixed)

"After initially being a bit nervous about it all I was fine, and as it went on I actually sort of, once it got to the mid-way mark through the course I started to actually look forward to thinking Saturday morning oh I am going to do this course you know" (Participant interview B, male)

Views on course length and format

Generally speaking, the participants felt that the length of the sessions were "just about right" (Focus group C, males). When the participants were able to cope easily with the recipe, they reported that they often finished early which gave them time to do the washing up and to socialise and chat:

"But then as I got more confident...we were finishing you know if anything a little bit before time you know. We were getting cleared up and we were ok, we were doing really well and nothing was rushed" (Participant interview B, male).

However, other participants reported examples of lessons which felt rushed because the dish was more complicated or where the primary ingredient, such as chicken or meat, required more time to cook:

"Not long enough...Some of them were longer you know what I mean, the classes ended but you were cooking, some of them like you had to cook like twenty minutes, half an hour, the stuff, you know what I mean like the chicken" (Focus group D, mixed).

"You have to wait for the mince to cook and put all the stuff in and like by the time you'd cooked that it was basically time to wash up wasn't it" (Focus group D, mixed)

This was particularly the case if some participants turned up late, delaying the start of the lesson:

"You had to be on time for it all to run smoothly but that was fine" (Participant interview C, female)

"Because people come, hurry up, hurry up, we must start and go, you know everybody is like that" (Participant interview J, female).

Although the general view on the number of sessions was that they "more than adequate" (Participant Interview B, Male) for what they wanted to achieve, several participants enjoyed the

course so much that they were keen to continue to learn and felt that the course should have been longer:

“A twelve week course would have been better” (Focus group D, mixed).

“I wanted it to be longer. I was looking into more cooking lessons I could do. I even said to my friend at work, an’ she doesn’t cook at all, about it an’ she’s trying to look for lessons to do as well now” (Participant interview A, female).

Views on the teaching approach

The overall teaching approach and format appeared to contain something for everyone. Beginners felt that the level was right for them as they would leave the course with a lot of new skills, but those who were more advanced and confident also felt that they got something from the course:

“I think for beginners, which we all were, I think they were absolutely brilliant because they didn’t explain anything where you thought, ‘Oh God, I know that.’ It was explained to you on a level that you understood and they were covering things just in case you didn’t but you were glad that they did – if that makes sense?” (Participant interview D, female).

“I think like I say I think for a beginner at least you are going to leave with some skill in doing every type, you are going to be able to look after yourself and there is always you know a wide range” (Focus group B, mixed).

“I think it was a fairly complete course. You got a lot of knowledge in eight weeks and it’s up to you to utilise it if you want to, isn’t it?” (Focus group A, males).

In general, participants appeared to find the style of teaching to be acceptable and engaging, with appropriate amounts of instruction and hands-on practice. However, one group in particular felt that the first few sessions were too slow and hands-off, and that by the time the participants returned to their stations they had forgotten what they were supposed to be doing:

“The first ones were kind of really slow to me, if they took the time to actually let us get on with it and actually show us how to do it without us having to stand around all the time” (Focus group D, mixed).

“Yeah, instead of waiting for them to do, to show us, get on with it you know what I mean? Because nine out of ten we – when they were finished, we started and like we were like what do we do with this, and they had to explain it us again” (Focus group D, mixed).

This group felt that the lessons could be improved by being more interactive with less time spent watching. They felt that their attention wandered during long periods of watching and preferred a more interactive style of teaching where they would start at the same time and cook alongside the facilitator:

“If we started at the same time as them and followed them it’s easier, and everyone is at the same level then you know you are not standing about waiting or looking or watching him cook and then waiting for us to cook it and taste it ourselves” (Focus group D, mixed).

Views on the course facilitators

Participants generally had good rapport with the course facilitators and enjoyed discussing recipes and ingredients with them:

“Like I said I think she was really good, if you had any questions that they couldn’t answer then they were straight on Google and by the end of the class they had printed stuff off” (Focus group B, mixed).

“Fine, he explained stuff, you could ask questions, and it was quite interactive, back and forth (Focus group B, mixed).

Different facilitators were reported to have different teaching styles and this was evident where participants mentioned having several facilitators over the duration of their course. One participant stated that their group had as many as three different trainers and another felt that this change could be a little disruptive for their relationship with the facilitator and their overall confidence:

“Yes, they put about three different ones actually, it changed every other week” (Participant interview C, female).

“As he says you build up like the banter and the friendship and that with them and then all of a sudden you’ve got someone else and you’ve got to do it all again” (Focus group D, mixed).

Not all sites reported the presence of volunteers but where they were present they supported the facilitator and helped those participants who had fallen behind or who needed extra help:

“But obviously the girl that was running the workshop had a couple of helpers, so they sort of gave them a little bit of help” (Participant interview F, male).

Other participants’ skill level and impacts upon course

Overall, participants felt that the mixed range of abilities and experience in each class had not been a problem. Although instances were given of some participants being slower than others, this did not appear to have disrupted the classes or to have caused frustration for faster participants. Sometimes, the more experienced participants took it upon themselves to assist those with less confidence:

“I thought it was okay because I remember the first day, I can’t remember what I was doing, but I couldn’t do it so the guy next to me offered to help me because he was more experienced so I said, ‘Oh yeah, thank you.’ I think he helped me out a lot, if I’m honest, because I was really bad, especially the time after, when it were chopping. I couldn’t do it and he was really helpful towards me so I really appreciated it” (Participant interview A, female).

Those who completed the tasks easily were sometimes given other jobs whilst waiting for others in the class to catch up, or would help less confident participants with chopping, or with handling ingredients such as meat and fish:

“They’d give you another job like if you’d finished you can crack on with the washing up while somebody else is still doing something else, so, and there is usually always two people in the class, like leading the class, so, there is always somebody else to like assist the people that have fallen behind a little bit while the other one carries on” (Focus group B, mixed).

“If I was working with someone and we needed a stir or I needed to chop something up for them I would do, or you know just odd things that I would help out. You get people who don’t like certain things or handling certain foods you know” (Participant interview C, female).

“And they always made sure that we were all up with what we were doing, cos obviously we were in a group, so we all waited for each other as well and there was no rushing. You didn’t have to feel like, ‘Oh God, they’ve done it faster than me.’ You know, so it was done at a pace for everybody, which I found nice as well” (Participant interview D, female).

Suggestions for improvement

Although the participants enjoyed the course, some had suggestions for how the experience could be improved. Several felt it would be beneficial if the JOMoF offered a follow-up course as they were keen to develop their skills and they wanted something more challenging which would test them and determine whether their skills had improved since they began the course. There was a worry from some participants that they might forget what they have learned on the course if they were not given the opportunity to ‘keep their hand in’:

“What would have been interesting would have been if you did a follow up course where it’s sort of like if this is the learners’ one you’ve got an intermediate one where it’s a bit more complicated and more interaction, that would be quite interested to see how you have improved” (Focus group B, mixed).

Completing the course gave the participants a real sense of achievement and one group felt that this could have been marked by perhaps receiving a qualification at the end of the course that they would be able to put on their CVs as a record of their achievement:

“(If you were) given a certificate and acknowledging that you’d actually done something. It would have been nice to have actually had something like that” (Focus group D, mixed).

“Like a Food Hygiene you know what I mean like a basic food hygiene qualification, if you could get something like that out of it” (Focus group D, mixed).

Some participants felt the course should have placed more emphasis on promoting cheaper ingredients and provided more information about cooking on a budget, because this was more relevant to them than promoting expensive organic produce:

“I think maybe the use of like lentils and pulses and things like that...it might be something, and again it’s a cheap, you know a cheap meal to make or something” (Participant interview E, male).

“They didn’t actually cover that actually because that is a good point. Because it all depends on how much you are earning and what you have got spare for your food” (Participant interview F, male).

One group mentioned that they had expected to receive more information on the amount of calories in certain foods and felt that this would have been particularly useful when planning meals or cooking recipes at home, particularly if the participants were trying to lose weight or eat healthily:

“They didn’t even do the calories did they, you know when you had done an actual meal they didn’t tell you how many calories were in that meal” (Focus group D, mixed).

“(It’s useful) if you are calorie counting and that type of thing” (Focus group D, mixed).

4.4.2.2. Stakeholders’ perspectives

The stakeholders who were interviewed talked mainly about their views of the development of the course, the course manual, and the positive and negative aspects of the current course format.

Flexibility and consistency

Stakeholders had somewhat mixed views of the current course format and its franchise-like nature recognising that, because of the latter, consistency of some aspects were desirable but that there also needed to be an element of flexibility to adapt the course to local needs:

“It’s good that we’ve got flexibility in terms of, we’ve got a theme for each lesson of the course and we can kind of pick recipes that fit in with that theme, which, I think, if it is that kind of franchise model, it’s important to have set recipes” (Stakeholder 1)

“I think the messaging needs to be consistent and we are looking for the same outcomes, but the delivery can be different because we don’t want Jamie clones...So a local lad employed in Leeds is going to be able to relate to his group. He’ll know where the shops are, the problems sourcing some of the ingredients” (Stakeholder 3)

Stakeholders felt that complete homogeneity of the course was neither warranted nor desirable. Some felt slightly limited in the amount that they have been able to adapt the course:

“The one thing we can’t do is kind of make any changes to their recipes or kind of adapt them in any way” (Stakeholder 1).

“Most of the sites...deliver the same 8 week course, which follows the same structure. Within that, they’re able to be flexible around what recipes they use. So, as long as they’re covering the core skills, they can swap different recipes” (Stakeholder 4)

“I’m not going to go for a fillet steak recipe, am I? And there are two in there. I think it’s about being sensible, isn’t it? Obviously you’re going to adapt your classes to the different needs of your group depending on if you’re working with Asian communities or you’re working with deprived areas” (Stakeholder 6)

Views of the manual

Stakeholders did not tend to see the manual as a prescriptive document that could be used as a ‘step-by-step’ guide to running a class. Rather, it was viewed as a comprehensive guide or reference tool that trainers could use to help guide their lesson planning, or supplement their knowledge about a certain topic:

“It is meant to be a reference guide and in it, especially the second half of it, it’s supposed to be all I would want you to know if you were teaching a chicken class. So it’s a go to place where they can pull out what they need” (Stakeholder 3)

“I think the content’s very good. It seems to capture everything within the classes but it has been built over time on what we actually do anyway so there’s nothing really new to it. It’s just really to make sure that every centre’s running the same. There’s lots of information in there, lots of things to think about. It’s a good working tool” (Stakeholder 5)

However, one stakeholder commented that some of the information it contained, particularly around nutrition, was too complex and beyond the level of some of the trainers, particularly those not from a nutrition background. It was felt that there could be better consultation with the centres on what should be included in the manual:

“I mean, the manual is helpful as a guide but I would say different centres are probably using it slightly different. We don’t use every aspect of it and the level of nutrition that they’ve embedded into that manual, I would say, is far too advanced for our trainers....and I think that comes from a lot of that work being done down in kind of a nutritional centre in London and not necessarily being consulted with the centres to take on board all their learning” (Stakeholder 2)

Evolution of the course

Overall, stakeholders tended to view the course as one with cooking skills at its core, with nutrition education secondary to that and other messages, such as ethos, as tertiary to the course’s primary aim:

“I think it’s teaching people how easy it is to cook from scratch and also educating them as to why they might want to do that and also how to eat a bit better” (Stakeholder 3).

“I think the key thing is to get people cooking – isn’t it? That’s your core skill and then obviously if you can try and get people cooking and giving them confidence in their own cooking skills, then the other bits that surround that should hopefully come with it” (Stakeholder 6).

However, stakeholders commented on how the course had begun as very much a cooking skills course only, but that nutrition had been gradually incorporated as some stakeholders saw the potential to add value to the course by including nutrition in its curriculum:

“At the beginning, Ministry of Food was all about cooking skills and making sure people could cook anything - teaching them all the skills to do that rather than thinking about the nutrition or the health side of it. Whereas today, it’s got a lot more of the health and nutrition within the course” (Stakeholder 1)

“I think there wasn’t any nutritional message and I just felt we were missing a trick. I just felt if Jamie has got all those people on board to cook, just by being fun, how great if he could make nutrition fun...So to try and get the element in, I thought if Jamie has made cooking accessible for people he can do the same in bits of nutrition” (Stakeholder 3)

“In the early days, it was just about teaching a recipe and that’s it, whereas now there’s much more structured around developing and moving through different cooking skills, but also different health messages as well....It’s now got a much clearer structure and it works as a course rather as one-off things. The programming has to make sure that it fits within our guidelines – 70% healthy recipes, 30% unhealthy or treat recipes” (Stakeholder 4)

From a practical perspective, stakeholders commented on how the course has also adapted to participants’ preferences for a shorter course, but that in doing so it was possibly accepting a compromise on slightly reduced effectiveness:

“The length of the course was changed. Originally it was 10 weeks, when we first started Ministry of Food, which we always said was too long to get people to commit. Yeah, at 10 weeks they’ll probably make a bigger impact on their life but then we were finding a lot of people didn’t want to even sign up if they knew they had to do it for 10 weeks. It was too much of a commitment” (Stakeholder 1)

“It used to be 10 session but we were finding that people, it was a lot for people to commit to and especially in some of the more deprived areas, people have chaotic lives...so we moved it down to 8 weeks. Eight weeks we feel covers enough of the core cooking skills that you need ... you’ve learnt how to bake, stir fry, you’ve learnt how to use the ovens, you’ve learnt how to pan fry and, you know, you’ve learnt various different recipes and techniques” (Stakeholder 4)

4.4.3. The consequences of cooking skills interventions for UK adults

Participants were asked to discuss whether they felt the course had had any impact on their feelings about or behaviours in relation to cooking, and whether they had made any changes since participating in the course. A range of potential impacts and changes were identified in the transcripts, and these were grouped into the following themes, which are discussed below: feelings about cooking; development/improvement of skills; heightened attention to food purchasing;

replicating the dishes taught on the course at home; the ability to adapt and experiment; reduced use of processed foods; healthier food preparation techniques; and changes in palate and diet. In addition, a few participants reported positive benefits of participating in the course which were not specifically related to cooking, diet or food shopping, and these are also discussed in this section.

Feelings about cooking

Unsurprisingly, given the generally high levels of enjoyment associated with taking part in the course, an increased or renewed enthusiasm for cooking was described by several respondents. One described feeling less “bored” [Participant interview D, female] with cooking now – “I can’t wait to start tea” [Participant interview D, female] - , while another said that they felt “more inspired” [Participant interview C, female] to attempt more cooking from scratch.

One female respondent talked about how the course had revived a previous interest in home baking, which over the years she had drifted away from because of time and work pressures and a general loss of interest in cooking. Another felt that the course had given him “an appetite to learn more” [Participant interview B, male], and several expressed an interest in taking part in future JOMoF courses.

Development and improvement of skills

Perhaps reflective of the emphasis placed on technique and skills in the course, several participants reported having learnt and put into practice new ways of chopping and preparing ingredients. This was particularly the case for participants who had had limited confidence or experience before the course. Learning how to hold and use a knife correctly was commonly mentioned, with participants describing how they now felt safer, more confident and more efficient in their knife technique:

“Things like I’ve always been awkward chopping vegetables and again we are being shown how to chop vegetables properly and it’s great you know, some of us make a bit of a mess of it but” [Focus group C, males]

“Now I can actually get a knife out”

“Using them, whereas before you had one at home and you are chopping up onions you are like that you’re dead careful but now” [Focus group D, mixed]

“Yeah well the whole, like the rock chop thing I use that all the time now”. [Participant interview F, male]

Several mentioned the advised technique of keeping the “bottom end” [Participant interview D, female] of the onion intact until the rest had been chopped up. Some had been motivated to buy, or hoped to buy, new knives in order better to put the techniques into practice. Even some participants who were used to cooking felt that they had learnt new knife techniques:

“[Facilitator] taught us how to do some knife skills – how to use a knife, you know, how Jamie will use it and everything. So all those things actually, like, you know we learnt it so it was all, you know, a different way of an approach... I’ve been doing, you know, cooking for like 10

years for myself so, you know, learning something, a new skill, was always helpful.”
[Participant interview I, male]

Other participants, with more experience and confidence prior to the course, tended to feel that they already had sufficient knife skills. For example, one commented that he was “used to cooking and chopping and things” and was already familiar with techniques such as the ‘rock chop’; however, he had been intrigued by the tip to use a spoon to peel ginger: “that was quite a novel trick, because I know when I chop ginger I usually get a load of waste” [Participant interview E, male].

Other techniques and skills mentioned by the less confident and experienced participants included basic tips on “how hot to have your pans” [Focus group C, males], how to cook an omelette, and how to cook poached eggs: “And that again that is the most basic of skills, but there is a right way and a wrong way to do that. So that was handy” [Participant interview B, male].

However, there were some participants who, while they described enjoying learning the techniques during the course, felt that they would most likely stick to their existing habits.

“I suppose the way that they cut an onion was new, you know. Yeah. It’s different from. As you said, leaving the core on the end. But I haven’t had too much trouble in just sort of, you know, topping and tailing it and cutting it in half and peeling the skin off and then just chopping it up. That’s right. ... So, yeah, I don’t know whether I’ll adopt that technique where you keep the root until the very end.

Moderator: “So it hasn’t transformed the way you chop your veg?”

“Not really, no, but I knew about the grab, you know, where you put the knife inside your thumb and fingers. Yeah.”

Moderator: What about you, [Bill]? Did it change how you chop things up?

“Not really. No.” [Focus group A, males]

Heightened attention to food purchasing

Several participants described how the course had made them think more about what food they bought and how they shopped. There were several aspects of food purchasing which participants felt they had become more aware of or interested in since the course: value for money, attention to labels and nutritional content, attention to food quality and provenance, buying fresh ingredients, and seeking variety and being more adventurous in shopping.

The extent to which this heightened awareness of and interest in aspects of food shopping led to actual changes in shopping practices, however, appeared to vary. For some, their way of shopping for food appeared to have undergone quite substantial change. For others, the course appeared to have had only limited impact on how they shopped for food, although they might find themselves noticing and thinking about issues (such as sugar content or labels) more than before. Each of the aspects listed above is now discussed.

Value for money

Several participants commented that the course had encouraged them to 'shop around' more for better value fresh produce, particularly those who were not working full time and who could spare the time.

"At the moment I am not working full time or anything like that. I don't have huge commitments so time is not the main factor you know it comes into everything obviously but it's not the main thing. It's ingredients, I look more into that now, I look more at things like fruit and vegetables, where to buy them, price obviously"
[Participant interview B, male]

Interviewer: "Do you feel it's had an impact on what you're spending? I mean, are you spending more on food or less on food?"

"No, cos it's encouraged me to look round as well. Cos obviously I want to make really good food an' healthy food. ...it has encouraged me more to shop around a little bit more and think, 'Oh, I can get that cheaper.'" [Participant interview D, female]

Although 'shopping around' took more time, for this participant, it had become a more enjoyable and satisfying experience:

"So I have, tend to, I'll do price check on me phone a lot more as well an', d'you know, think, 'Oh, I'll go there this week cos they've got all't offers what I want,' an' then, like I say, we go't market once a week an', you know, an' it's encouraging kids as well cos, like, me 13 year-old, she were, like, 'Oh Mum, if we go to this stall, look we can get,' I think there were seven apples for £1. She, 'But if we go to this one, we can get 10,' so it's encouraging 'er as well to, an' they know when we go to't market, it's like, 'Go get what fruit you want,' you know. We go to't stall and they can literally 'ave, you know, everything, because it's that cheap, you know, an' it's really nice."

Interviewer: "So it's made shopping into a more pleasant experience as well?"

"Yeah. Yeah, definitely. You're not sort of trudging round the supermarket."
[Participant interview D, female]

One participant commented that she felt she was actually spending more money on food shopping since doing the course because she was tending to buy better quality items and more fresh produce. For her, the trade-off in terms of better meals was perceived to be worth it. She also noted that she was more inclined to freeze leftovers now than throw them away.

"I think I'm spending more but I think it's worth it because I get a better meal out of it. And plus it lasts a lot longer anyway, no matter 'ow much you spend on that cos you can just freeze it" [Participant interview A, female].

Another commented that she had learnt to take a longer term perspective on the value of food purchases, realising that upfront expense on, for example, store cupboard ingredients could actually lead to savings in the future:

“An’ a lot of the time, like, a lot of people think, ‘Oh it’s just cheaper to get a jar,’ or ‘It’s just cheaper to buy it done,’ but actually it in’t. When you break it down – like, the initial lay-out, when I were buying all the spices an’ all ... But they last for ages”. [Participant interview D, female]

Labels and nutritional content

Although several participants recalled having discussed and examined labels during the course, the extent to which this particular aspect of the course had influenced their subsequent shopping behaviour varied. For some, it had had little impact:

Moderator: “Has it made you pay a bit more attention to that [labelling]?”

I don’t think so. Not so much. You know what you like, don’t you, an’ you’ll invariably go back for that, if you’re happy with it. ...when I go shopping I just throw it all in and forget it, and that will do” [Focus group D, mixed].

“I can’t consciously say that I’ve looked at, stood there and read a packet and had a look” [Participant interview E, male].

For others, the course did appear to have encouraged greater attention to labels when shopping, in two regards. The first was checking labels for the presence of unnecessary amounts of certain ingredients. One or two participants mentioned looking for “hidden” sugar or salt, for example:

“So I do look at, now they’ve shown us ‘ow to read the labels an’ things like that, I look at them all’t time. An’ like, wi’ jars an’ things like that, the amount that they put in ‘em and things they put in ‘em, you just think, ‘Well, you don’t even need that in there.’ So they made us aware of quite a lot, you know, when they were going through things cos it were like, ‘Yeah, well, if you read the back of half of these labels, you’d never have eaten it again!’” [Participant interview D, female].”

The second was looking out for misleading ‘healthy’ labelling. Several recalled an activity during the course in which they had been encouraged to study the label on a pack of breakfast cereal. One participant noted that, as a result, he had realised that ostensibly healthier ‘adult’ breakfast cereals were not necessarily any ‘better’ than those aimed at children, in terms of their fibre and sugar content:

“With the kids, with the kids’ breakfast cereals you know, I would probably like have a look at something that I would think was quite healthy and maybe get that. But I realised that the kids’ cereals have probably, have more wholegrain in them or something like that and not as much sugar as what you would expect to be healthy food you know” [Participant interview E, male].

“Some things can be very vague, there was one, we were in Sainsbury’s there was, I can’t remember what it was but there was basically it was two for one of this thing, but there was also some, something similar but it was slightly cheaper on its own and it had more of it, it was a diet something, it was meant to be low in fat and sugar, but when you read the labels these smaller packets actually had more content than what this one packet had” (Participant interview F, male).

Quality and provenance

Related to the previous theme, a few participants described how the course had made them a little more discerning about the provenance and quality of the food they were buying. Comments from several participants suggested that the JOMoF course put a strong emphasis on buying from markets rather than supermarkets, the implication being that food was likely to be better value than in supermarkets, more likely to be locally sourced and better quality. This message appeared to be particularly emphasised in one area where the JOMoF premises were actually based in a market hall, alongside fresh fruit and veg, fishmongers and butchers’ stalls. A few participants responded positively to this message, describing how they had become more adventurous in their use of food markets since the course.

“I’ll go to, like, [town] market once a week, you know, to the back an’ get all the fruit an’ veg an’ it’s just as nice as anywhere, you know, an’ cos they get to know you, it’s, like, all my fruit, a couple of oranges in or, you know. [Participant interview D, female]

Others, however, appeared largely to have carried on shopping at their usual supermarkets. One participant raised in the interview that she did not agree with the course’s implied equation ‘local market=better’, and commented that she herself felt that supermarkets were far safer and more trustworthy:

“Oh, I wouldn’t buy any meat from the market here because I don’t trust it, but I would buy it from the supermarket because it’s stamped, it’s got a date on it and I know what I am paying for it. So there is, there was more promotion to use the market but to me I like the security of the supermarket” [Participant interview C, female].

Fresh ingredients

As can be seen in several of the examples above, a few participants had become more enthusiastic about buying fresh ingredients since the course, particularly from local markets. Male participants in one focus group described being more open to buying fruit:

“I didn’t used to buy a lot of fruit but I do now. It’s good for you. I buy apples, bananas, strawberries, grapes.” [Focus group A, males]

For others, the course had not necessarily increased their purchase of fresh produce, but perhaps reinforced an existing tendency or aspiration:

“I try now I think to buy a lot more fresh, well we always did buy fresh produce, I mean my typical day would be a sandwich and a banana or an orange as my fruit. So I do tend to eat fresh produce and I do try and like on a Sunday buy a load of fresh vegetables as well, just as a boost in case we’ve not had much during the week” [Participant interview E, male].

One male participant noted that while he still mainly used supermarkets for the bulk of his food shopping, he had “sometimes sort of looked in the markets and bought things fresh” [Participant interview B, male] since the course, and gave specific examples of buying fresh rather than frozen vegetables to eat with the Sunday lunch, and making jam with fresh fruit rather than buying a jar.

Others, however, commented that while they felt they ‘ought to’ buy more fresh produce since completing the course, they had not felt sufficiently motivated to do so:

“She [facilitator] told me where to get it all and I just think yeah I’ll get it and then there is queues there and that, canny be bothered” (Focus group D, mixed).

Variety and adventurousness

One participant, a mother of three who had lacked confidence in her cooking before the course, described how the experience of using unfamiliar ingredients during the course had given her the confidence to buy items which she had never bought before:

“Yeah. I mean, I got some garlic salt – which I didn’t even know existed [before] – but I was again doing a recipe and I thought, ‘I wonder if I can put garlic salt in?’ cos I really like garlic” [Participant interview D, female]

The same participant recalled the course tutors recommending buying spices from specialist Asian stores and market stalls, where they would be cheaper than in supermarkets, and advising participants to be assertive about what they wanted to buy:

“An’, like, in the market, there’s quite a few of your Asian food stalls so you can go in and, like, they [course tutors] were saying don’t be scared to, like, with ginger, if you only want a bit, break it off and just get that. And I wouldn’t have dared cos of the, you know, like – even a bunch of bananas, I wouldn’t have dared break any off. I’d of been just, like, ‘I’ll just have them.’ But they said to us, you know, don’t be scared to just, if you just want that little bit, just get that little bit or just say to them, ‘Can I just have a small amount?’ [Participant interview D, female]

One participant commented that, while his overall way of shopping had not changed much since the course, he had resolved “to repeat the same food” less than before, and to try to buy “more colourful food”, particularly salads: “I’ve been, you know, trying something new all the time” [Participant interview I, male]

Replicating the dishes taught on the course

Experience of trying to replicate the dishes taught on the course back at home was varied. A few had not attempted any of the dishes since completing the course, and several said that they were 'thinking about' or 'would probably' try some of the dishes again at home, but had not done so yet:

Moderator: "And you've done some of the recipes again, have you?"
"I've tried the soup but I think, once you've done them here, it makes you less hesitant to do it at home, doesn't it? Whereas before the course, if you hadn't prepared the food, you might have thought, 'That sounds a bit of a challenge,' you know, so I suppose it's, you know, it's there, it's an option to you, isn't it, to just go ahead and make it. I'd probably try the soda bread again cos that was nice" [Focus group A, males].
"As I say I haven't used them regularly at the moment, but I would imagine that I would go back and say oh yeah well let's do that or let's have that."

Moderator: "But they will just be there in the back of your mind?"
"Yeah, oh I just fancy that so I will just get the, take the recipe out and give it a go. [Participant interview E, male]"

Others, in contrast, had made some of the dishes several times since completing the course. Participants in one focus group commented that the recipes were "very easy" to follow at home [Focus group C, males]. Typically, the recipes tried at home tended to be the dishes which participants themselves liked or which family members had enjoyed trying, such as pizza, curries and hamburgers. Several commented that they had switched from buying such foods from takeaways or in ready-made form to making them themselves.

"I would say it has changed definitely, I would have bought readymade pizzas and you know kind of readymade curries and now I will make my own and make it, I've not made a readymade pizza since doing the course I always make my own pizza because it's just so easy" [Participant interview C, female].

"I've been doing like a pasta thing where you make your own pesto from scratch I've done that quite a few times and the keema curry because my boyfriend is very into his curries, so he's like rather than getting a takeaway now we'll do one at home" [Focus group B, mixed].

"Oh yeah, some hamburgers, Jamie Oliver hamburger things and there was things you know that we made on the course that I make them regularly at home now, all the family love them, so that was my favourite one yeah" [Focus group C, males]

Moderator: "So you made pizzas homemade pizzas and you've done that at home as well, have you tried it?"
"Yeah, Quick and easy, I'll give the kids bread base, I will buy the bread base and then..." [Focus group D, mixed].

Other recipes which had been repeated at home by a few of the participants were breakfast recipes such as porridge and omelettes, and sweet recipes such as scones and jam:

"I've made omelettes since then, I haven't done a poached egg but I.....you know I've made omelettes myself.....yeah" [Focus group C, males].

"Well the very first lesson was an omelette and it was absolutely delicious and I thought it's ages since I've had an omelette and I went out and bought a nice little pan just the right size and started making omelettes" [Focus group B, mixed].

Moderator: "So how, have you done any of these things at home?" (0.32.08.8)
"Yeah, I did five poached eggs that week, five and omelettes" [Focus group D, mixed].

"Every day, more or less every other day we have porridge and definitely every day we have the nuts topping that they did here because it's nice... so we always have that. Nice with nuts." [Participant interview C, female]

"I made homemade jam, yeah, which is what they taught us to do and that is a very basic skill, in fact I am thinking about going out and buying a jam pan, which I would never in a million years thought of doing that because I just buy a jar of jam." (Participant interview B, male)

Another participant described having made the Mexican salad "quite a few times again" [Participant interview E, male]. Most of the dishes which were replicated enthusiastically at home seemed to be home-cooked versions of dishes which would previously have been bought from takeaways or ready-made, such as pizzas or curries.

The ease of replicating the dishes, by those who had attempted to do so, was varied, with some reporting greater success than others.

"Yes I was quite surprised actually, because when you do it in class it's obviously step by step and you are being led then you go home and you just think right, get all your stuff out, because obviously your kitchen is totally different and do you have all the same things or whatever, you are having to adapt, but I was quite surprised they did turn out quite successfully" (Focus group B, mixed).

Failure to replicate the dish as it had turned out on the course had not necessarily deterred participants:

Moderator: "So have the things that you've made at home turn out ok I mean the hamburgers the eggs and things?"
"Yes, Yeah, Oh yeah superb [Focus group C, males].
"I've tried to make little things but it didn't turn out right. I'm one that you need to see it, to do it, so I like to see things an' then I can do it an' copy it or

as they're showing me, do it at the same time. But I have tried an' it didn't turn out exactly how I planned but it does taste okay. [Laughter]

Moderator: "So you've been a little bit more experimental?"

"Yeah" [Focus group A, males].

"I haven't done the meatballs yet but I've done the chicken fajitas a couple of times. Once a disaster because I burned it, but the other one was alright, it was still edible but you know, but yeah" [Focus group B, mixed].

Some participants commented that, as a result of using it in one of the pasta recipes on the course, they had now switched to wholemeal pasta because it 'cooked better':

"We used the wholemeal, I tried it at home and it turns out a lot better than the white one. Because it's not as gooey, with white pasta you can get that gooey, Yeah, Yeah like snot" [Focus group D, mixed].

One participant from a south Asian background who had been keen to learn more 'Western' cooking was particularly pleased with his success in replicating the recipes at home:

Moderator: "What sort of things have you done [at home]?"

"That omelette with the, you know, the green leaves."

Moderator: "The spinach."

"Yeah, yeah, yeah. Because that was a new thing for me. I make normal omelette but this spinach, so it's very healthy, easy, sometimes when I have spinach, you know too much, I can put in omelette and I use it. And the pasta, she taught us – what is that pasta? You know, with the fish."

Moderator: "So you've done that at home and it's worked out quite well?"

"Yeah, yeah, yeah. So, do it once, you know, you become expertise [sic], you know. You do it again and again" [Participant interview H, female].

The ability to adapt and experiment

A few participants described how they had felt able to adapt recipes and techniques taught on the course. Typical adaptations included swapping one ingredient for another which was either cheaper or more to their taste, leaving out an ingredient they did not particularly like, or varying the quantities to taste.

Moderator: "You've done it and continued at home, do you find that in continuing with those recipes you make your own modifications to them?"

"You can do"

Moderator: "Yeah but I am asking do you?"

"Yeah I think I do, I probably put a bit more of something in that is in the recipe you know" [Focus group C, males]

"Yeah. Oh, that [fish curry] is beautiful that. I still make that now. But it's delicious. If you get the recipe, it is really – I even make it for me Mum and Dad... they're round't corner an' I

send it round for them cos me Dad loves it. An' you can do it with any fish. We had, we've had it with salmon a couple of times if it's on offer an' we've had it with haddock. We've had it with whatever fish is on offer". [Participant interview D, female]

For the participant above, having the willingness and ability to experiment in this way seemed to be a new experience, which she attributed to her new confidence in cooking.

"If I think of a recipe an' I think, 'Oh, I wonder if I could change that and mix that?' Whereas before, I wouldn't have even looked at a recipe. I'd have just not even. I'd have thought, 'Oh no, all that ingredients. It's gonna cost loads,' but now I know it dun't so I just think, 'Oh right, I'll take that, go get what I need' " [Participant interview D, female].

In some cases, participants described adapting a recipe to make it more 'healthy', or to introduce more fresh ingredients. For example, the same participant as above described using natural yoghurt rather than cream in a curry recipe "to keep, like, the fat content down" [Participant interview D, female], and another described adapting a tomato soup recipe which had been taught in the class to use fresh tomatoes rather than tinned:

"You know, she'd used more of a can but I use more of a – she used canned, Italian canned tomatoes – but I used the fresh tomatoes. I improvised it on more than that, other than I just, you know, I used, to squash it, I used my juicer to squash it and everything. So I'd read in the way how I wanted to do it" [Participant interview I, male]

Others, however, were more hesitant about experimentation and reluctant to depart from what they had been taught on the course:

"I'm not brave enough to do that, no. [Laughter] I'm not that good at cooking. I'm not that confident in the whole, be able to mix things around" [Participant interview A, female]

"But it's early days, I mean I think I might experiment you know. I might start going more to looking at what's been, what I've learned as I go on". [Participant interview B, male]

Related to having the confidence to adapt and experiment, several described how they were now more confident to follow recipes in general.

"I've definitely gained more confidence in cooking an' following recipe instructions. I think it's introduced me to new ways of cooking, so new recipes, cos you don't realise how many recipes are out there. I mean, I look on the internet an' it's, like, 100 chicken recipes let alone anything else. So it's crazy but, yeah, I've got apps for my phone with recipes an' stuff so I just pull them down" [Participant interview A, female].

Reduced use of processed foods

A few participants described how, following the course, they had moved enthusiastically away from reliance on ready-made ingredients, such as cook-in sauces, and from use of frozen and microwave foods, towards more cooking from scratch, particularly of dishes such as curry and pizza.

“Made a curry from scratch. I wouldn’t’ve dared [ie. before the course]. I wouldn’t even know where to start or. ... It’d’ve just been, like, you know, put your meat in, couple of onions and a jar. Whereas now, the only jar sauce I use is chilli ... because there’s only two of ‘em what eat it, so that is the only jar food I buy but, other than that, everything’s from scratch”. [Participant interview D, female]

Interviewer: “The kids enjoy making the pizzas, don’t you? You like, making your own pizzas.”
“Was that something you would have ever done before?”
“The dough, no, I’d have bought ready-made pizzas. You know, the bases, an’ then just let them put the toppings on. Whereas now ... we make up a dough, they put the toppings on, put it in’t oven an’. So they do, it’s passed on’t kids now as well”. [Participant interview D, female]

“Yeah, it has because, as I said before, I’d just eat microwave meals, that’s it, and they’re obviously not good for me but now I just think, I don’t even want it, cos we’ve got a freezer full of all the frozen food and I ‘an’t eaten from it in, like, two week because I’d rather go out and buy something fresher an’ make it from scratch and it’s a lot nicer than, like, a frozen pizza”. [Participant interview A, female]

One participant who appeared quite experienced and confident at cooking noted that he was now more likely to buy fresh chillies than to use chilli powder.

However, for others, there was still a tendency to rely on some processed ingredients, although there was perhaps a greater tendency to mix and match between processed and ‘from scratch’ ingredients. One participant noted that while she might now be more inclined to make a vegetable stir fry, she would use pre-cut frozen vegetables because she did not enjoy chopping vegetables.

“A little bit, yeah a little bit, I’d buy, but I’d probably buy things to help me, so I’d buy a packet of stir fry vegetables and do a stir fry. I have never bought many ready meals, but I will by things that are prepared to make cooking from scratch easier”

Moderator: “To make it easier, and is that the same, has that changed in any way?”

“No I still buy that; I still hate cutting veg” [Participant interview C, female].

Another commented that her working patterns limited the time she had for ‘cooking from scratch’, meaning that sometimes she only cooked ‘proper’ meals at weekends, but that she did make more of an effort to incorporate some freshly prepared ingredients in meals even if she also relied on “some little easy, like little packets to make with it as well, if I don’t have the time to prepare all the food” [Participant interview A, female].

One retired male participant commented that he occasionally bought meals which required, as he saw it, some elements of cooking, such as ‘cook/roast in the bag’ chicken. While he had used such

meals in the past, he seemed more inclined to use them after the course, and less inclined to use ready meals which required simply heating up.

Moderator: "D'you think it's made a difference to what you cook at all?"

"A little bit."

Moderator: "In what way?"

"Well, I suppose in a way it's easier to think of something different now. Before, you had, like he says, a semi-routine and I quite like, I think I've told you, those 'cook in the bags' and I mean, I'll get at least two or three meals out of that and freeze so it's just a case if you open the freezer and see what you fancy. But you've already made it in the first place, which is nice. Rather than, as you say, buying ready made meals."

Moderator: "So you would maybe make something now and freeze some of it?"
"Yeah. Yeah". [Focus group A, males]

Another commented that while they had bought particular ingredients for some of the dishes on the course, they had not yet been motivated to use them.

"I got them [ingredients for cooking for scratch], I've got everything sat in the cupboard but I just stand there and actually [don't do anything with them]... [Focus group D, mixed]

Healthier food preparation techniques

A few participants described having adopted healthier food preparation techniques such as reduced use of fat and salt and less frying. One participant commented that he was now using olive oil rather than sunflower oil, and "not using as much of salt now" [Participant interview H, female], while another described generally trying to reduce use of fat:

"But mine is more of the Indian cooking so, in terms of, you know, you tend to eat a lot of butter and oil and everything, you know, which is, which I have tried to, you know, cut down as much as possible. So, which is good". [Participant interview I, male]

Another described now making her own oven chips:

"Whereas, like, now I'll do chips from scratch. Like, I'll chip 'em, boil 'em for 5 minutes, then put 'em in't oven, so it's a proper potato, you know, an' it's not fried, it's not, an' they taste just the same, which is so much 'ealthier". [Participant interview D, female]

It was clear that several participants felt there was something 'healthier' about preparing food from scratch, even if they could not necessarily explain in what way.

"Yeah, yeah well there is something in you know making it yourself and the kids can help as well so I can give them a bit of... I don't know if it is at the end of the day any healthier but

there is something about making your own it makes it kind of worthwhile doesn't it".
[Participant interview C, female]

Another aspect of healthier meal preparation which was covered on the course was portion size. Although several recalled this being covered in the course, in general few appeared to have altered their behaviour in this regard.

Moderator: "Do you think more about portion sizes now than you did before?"
"No, No, Maybe, they didn't really show how much portion size did they, though, you had a little bowl of what they made, they gave you the bowl and you had to use that amount, they give you the bowl" [Focus group D, mixed]

"I don't know. I don't put on weight so I just eat it anyway. [Laughter] I may as well have it"
(Participant interview A, female).

"I can't get used to it. Once I've been eating so much, to go back to it would be crazy"
(Participant interview A, female).

One participant, however, commented that while he still tended to prepare the same quantities, he was less inclined now to carry on eating after the point at which he was probably full:

"I do, I do look at portions now, I do, I used to, if the kids had left something I would probably pinch it off their plate and eat it, whereas now I think no my tummy has had enough it's time to just put that food in the bin rather than, but I used to or I do hate waste, so I think that is why I used to finish off what's on their plate and things like that. But now, for my own health and wellbeing I tend to not, I just eat what I've got out, I mean portion size it's probably still too big on some occasions". [Participant interview E, male]

Changes in palate and diet

The course appeared to have encouraged some participants to be more adventurous in their diet or to reconsider their diet and attempt to make it healthier.

For a few participants, the course had exposed them to vegetables they might not previously have used in cooking or eaten in restaurants. Despite expecting not to, they noted that they had quite enjoyed the taste and were more receptive to using such vegetables in their cooking in future, or to ordering vegetable-based dishes in restaurants. Others noted that their eyes had been opened to combinations they had not previously envisaged.

"I am right fussy, I don't like peppers and all that kind of stuff, but I started eating red peppers and stuff and I was thinking I never liked that". [Focus group D, mixed]

"But I enjoyed the meal, when I cooked it you know we tried it in class afterwards and I actually enjoyed it and with not being vegetarian I never would have thought of doing it you know. So that is the thing that made me think oh I might actually, if I ever go out for a meal

somewhere and I am in a Mediterranean restaurant or on holiday or whatever, I might actually buy a vegetarian meal even though I am not vegetarian. So that was something that was food for thought". [Participant interview B, male E]

"So it does really show you that, it has changed my way of thinking and, like, the fish with the tomatoes – I'd've been, like, 'Oh, no.' " [Participant interview D, female]

"I think in the soup they put quite a lot of celery in, they were doing celery today, Yeah so that was sort of new to me because you know we normally eat, if we have celery it's with dips or something like that, so" [Participant interview F, male]

Others described a wider tendency to reflect on their diet as a whole, prompted by what they perceived as the course's overall message of good quality food and healthy eating. One male participant commented that the course had helped him to have "a better basic understanding" and to give more thought to his diet:

Interviewer: "They emphasise that on the course you know, healthy eating and it has changed my palate you know a little bit. You know, noticeable so."
"Yeah, yeah, so you, you think you are appreciating more different flavours..?"
"I am appreciating things more I think, giving more thought to things yeah, it's a slow process you know, it's not long since we finished the course, you know but it's still there". [Participant interview B, male]

Similarly, one female participant noted that she had participated in the cookery course shortly after having successfully engaged in a weight loss programme, and that the coincidence of the two had fuelled a determination to use her new cooking knowledge and confidence to maintain the weight loss.

Interviewer: "D'you think the fact that you did it [the cookery course] kind of on the back of, you know, having lost weight and, you know, feeling good about that – d'you think that made a difference?"
"Probably, yeah. Like I say, it came at the right time cos I think if it'd come before I'd lost the weight, I wouldn't have gone. I'd have felt a little bit like, 'Oh no, out me comfort zone,' but I think cos I were, like, on the way of losing the weight that I wanted to lose an' it were like, 'Right, I want all these recipes. I want all this information to keep it going.' So I think it did help" [Participant interview D, female]

Another male participant described how, since the course, he had cut down on fizzy drinks and eating carbohydrates at certain times of the day, although it was not entirely clear whether these were specifically linked to advice given on the course.

Interviewer: "Has that changed in any way, since the cooking skills course? You mentioned, you know, you've had fewer fizzy drinks and things.

- Interviewer: “Yeah.”
- Interviewer: “But has the way you go about setting your meals out, has that changed quite a lot?”
- “I think yes, basically. I have reduced drinking a lot of, you know, fizzy drinks and everything. ... and also I’ve tried to eat carbs in the morning, like, you know, in the morning I’ll, or during the lunchtime. I try to avoid it for the, you know, after 6 or 6 o’clock I don’t eat any carbs.”
- Interviewer: “And is that due to what they told you on the course?”
- “Yes. Uh huh”. [Participant interview I, male]

However, there were other participants whose diet and thinking about food appeared to have been less affected by participating in the course. In one focus group, participants commented ironically that they might now be more aware of the “crap” in their diet, but that they still bought and ate it:

- “I have my cupboards all segmented now; all the crap is in one of them, and all the good stuff is just sat there.
- ...
- Oh no mine kind of match now, I had three cupboards full of food, and three cupboards full of sweets and crap.”
- Moderator: “So it’s balanced now?”
- “Yeah, it used to be sweet cupboards full, other cupboards yeah well whatever, now they are kind of like, equalling each other”. [Focus group D, mixed]

One focus group of men commented that their sugar and salt consumption was already, in their view, quite low – “so I don’t suppose it has made a difference” [Focus group A, males]. Another male participant said that he felt that the family’s diet was already quite ‘well balanced’ and had not been influenced by the course. The same participant commented that, although his overall diet did not appear to have changed, he felt more enjoyment of food since the course:

“I don’t think my diet has changed much, but it’s just more the fact that I am enjoying doing a bit more cooking from scratch. It’s more inspired me to do a bit more from scratch cooking” [Participant interview C, female]

Other benefits of the cooking skills course

Finally, a few participants mentioned other benefits from participating in the course which were not necessarily specifically related to cooking or diet. The break in the daily routine was welcome, both for those who worked and for those who did not. For the male participants who had been recruited through a men’s group, many of whom did not work, the course had been a pleasant social activity which had given them a new routine, potentially helped to reduce boredom and anxiety, and enabled them to meet new people:

- “Yeah, yeah. Some additional baking skills, but it’s a social thing as well, isn’t it?
- Yeah.

Yeah” [Focus group A, males]

One participant who worked in the food industry noted that it was useful in a professional capacity to know about the course and the centre, and to be able to mention it to colleagues and friends who were looking for information on diet and cooking. Another participant commented that he had been more aware since completing the course of general hygiene and tidiness, and that he felt he had been tidier and more safety-conscious during his voluntary work as a result.

4.5. Discussion

The primary aim of this work package was to explore the feasibility and acceptability of intervention, how participants engaged with it, and the consequences and impacts described by participants, as well as the views of stakeholders on the factors influencing the success of the intervention.

4.5.1. Summary of principal findings

The qualitative interviews and focus groups have contributed to our understanding of participants’ baseline cooking skills and feelings about cooking. Prior to undertaking the cookery training, course participants varied greatly in their cooking habits. At one extreme, participants were consuming microwave meals only, whilst at the other, they described a wide selection of dishes which they prepared regularly. Levels of confidence and enjoyment varied similarly, with some describing themselves as competent cooks who were familiar with ingredients and utensils, some feeling set in their ways and lacking in the confidence to experiment, and some appearing to lack confidence even in basic cooking from scratch.

A range of factors influencing cooking were identified, including cost, time, and work patterns, in particular, the irregular routines experienced by shift workers. Those living on their own said that they sometimes lacked motivation to prepare a full meal or felt that it was not cost effective to cook for just one person. Some households struggled to find dishes that everyone would consume, especially if members of the family had entrenched eating habits, or children were very selective eaters.

The qualitative interviews explored the practicality and acceptability of the MoF cooking skills intervention from the perspective of participants. In general, participants enjoyed taking part in the course, and several mentioned that it had encouraged them to step out of their comfort zone. Most felt that the course duration was appropriate for what they wanted to achieve, although a few would have welcomed a longer course. Similarly, participants generally felt that the length of sessions was sufficient, although a few reported examples of lessons which felt rushed because the dish was more complicated or where the primary ingredient, such as chicken or meat, required more time to cook.

In general, participants appeared to find the style of teaching acceptable and engaging, with appropriate amounts of instruction and hands-on practice. Beginners felt that the level was pitched appropriately for them, while those who were more advanced and confident also felt that they got something from the course. However, one group felt that the first few sessions were too slow and

hands-off, and expressed a wish for a more interactive style of teaching where they would start at the same time and cook alongside the facilitator.

Participants generally had good rapport with the course facilitators. However, where a group experienced a change in facilitators mid-course, this change could be a little disruptive for group rapport and confidence.

Overall, participants felt that the mixed range of abilities and experience in each class had not been a problem. Although instances were given of some participants being slower than others, this did not appear to have disrupted the classes or to have caused frustration for faster participants.

Overall, stakeholders were positive about the course. They generally felt that there was enough flexibility to vary certain aspects of the course and accepted that, because of the franchise-type model, that some restriction was necessary to ensure consistency and to protect the brand. Stakeholders viewed the course as one that is dynamic and has, and continues to, adapt to local needs and to participant needs. However, these changes to the course did not appear to be guided by the manual, which stakeholders described more as a reference tool. Nonetheless, stakeholders were generally of the same opinion regarding the aims of the course, describing it as one with cooking skills at its core, in addition to nutrition and other messages, such as ethos and shopping advice.

Some participants had suggestions for how the experience could be improved, including offering a follow-up course, receiving a qualification at the end of the course, more emphasis in the course on promoting cheaper ingredients and provided more information about cooking on a budget, and more information on the amount of calories in certain foods and recipes.

The qualitative interviews also explored the perceived effects and benefits of participating in the course, as perceived by participants. A range of potential impacts and changes were identified. Most participants described feeling more enthused about cooking following the course, and described having acquired new skills (among beginners) or improved technique (among those more experienced), particularly around knife use. Several described paying heightened attention to food purchasing when shopping, in a range of different ways, including being more attentive to value for money, paying more attention to labels and nutritional content, paying attention to food quality and provenance, buying more fresh ingredients, and seeking variety and being more adventurous in choice of items. Experiences of replicating the dishes taught on the course at home were somewhat mixed, with not all participants having tried all dishes, and dishes not always turning out as planned, although several participants had one or two favourite dishes which they had made several times. A few described how they had become more confident not only in replicating the recipes but also in adapting and experimenting with them. Some described reducing their use of processed foods, and attempting to use healthier food preparation techniques. One or two commented that they felt their palate and diet in general had improved or become more adventurous since the course.

In addition, a few participants reported positive benefits of participating in the course which were not specifically related to cooking, such as increased social contact, reduced boredom or anxiety, and increased attention to hygiene.

4.5.2. Strengths and limitations

Strengths

A key strength of this element of the study was that it enabled us to hear participants' experiences first hand and in their own voices. Two different data collection methods were used, focus groups and individual interviews. In the focus groups, participants were generally recruited through similar networks (e.g. a community group or workplace), and these similarities helped to put participants at their ease and encouraged them to comment on and 'bounce off' each other's views and experiences. In the individual interviews, we were able to explore participants' individual circumstances and how these affected their feelings about and experiences of cooking, both before and after the course, in more depth. This was enhanced by, in most cases, conducting these interviews in participants' own homes.

Both the focus groups and interviews were conducted with the aid of a discussion guide, which prompted the moderator to cover key topics and questions. However, qualitative research is flexible, and permits and encourages other lines of questioning and themes to emerge as fieldwork progresses. This was helpful in this study, as it enabled us to identify and explore a wide range of benefits and impacts of the course as described by participants.

The sample for the focus groups and interviews was reasonably diverse, in terms of representing different levels of cooking experience and confidence, different recruitment routes, a wide age range, and reasonable geographical spread.

Limitations

We were unable to achieve the intended number of interviews (12) and focus groups (6), although a reasonable level of data saturation was achieved.. This reflected the wider difficulties with study recruitment. A common limitation in this type of research is that those who engage positively with an intervention are more likely to consent to take part in an interview to explore their experiences of that intervention than are those who are less enthusiastic about it, meaning that the views of the latter may be under-represented.

4.5.3. Interpretation and conclusions

The qualitative findings provide insight into the types of impacts and outcomes that might be experienced and could potentially be measured in a definitive trial. However, this needs to be considered in light of the dynamic nature of the course that the stakeholders described. The participant interviews and focus groups also provided insight into how concepts such as 'increased confidence' and 'skills' can be unpacked. For example, we found that several described a heightened attention to food purchasing following the intervention, and identified different ways in which this manifested itself: attention to value, labelling, quality, provenance and so on. Each of these types of change could potentially be measured. Ability to cook recipes at home could similarly be broken down into several different elements or constructs, informed by qualitative research. This would enable more sophisticated measures of confidence, skills and so on to be taken.

The qualitative findings suggest that participants potentially took several different types of cooking, nutritional and food purchasing information and advice from the intervention. However, although

most participants appeared to have absorbed advice about technique and knife skills, the other types of message and advice were not so widely absorbed, typically each being mentioned by just a few participants. This may suggest that the cooking skills course as presently delivered is communicating a very wide range of information and advice, and that greater effectiveness may be achieved by focusing on a few key salient themes.

4.6. Conclusions

The qualitative findings support those of the pilot trial with regard to the potential feasibility of a definitive trial. In particular, the interviews and focus groups reported here emphasise the acceptability and feasibility and likely effectiveness of the intervention. A definitive RCT might also valuably include a qualitative element to further explore participants' engagement with the intervention and their perceptions of its impact. In a definitive trial, where the focus is on assessing whether the intervention can significantly impact on cooking practices and on diet, qualitative research will be particularly important for exploring (a) participants' experiences of making changes; (b) the facilitators and barriers to making changes; and (c) whether, and if so why, some participants are more successful at making changes than others. Thus qualitative research could provide an important adjunct to the quantitative methods in understanding how the intervention works, and for whom in different circumstances.

5. Work package 4 – pilot economic evaluation

5.1. Background

The purpose of this work package was to test the proposed methods for an economic evaluation in a definitive trial to ensure that they are feasible, practical and fit for purpose. An economic evaluation is the comparative analysis of alternative courses of action in terms of both their costs (i.e. the resources they use or save) and their consequences (i.e. their benefits and harms). In a definitive trial the collection of expenditure data from participants and cost data from the JOMoF centres will be used to determine the costs of providing the cooking classes. These data will then be used to estimate if these classes represent an efficient method for sustained and clinically significant diet change of at least a half a portion (40g) of fruit and vegetables per day. In this section the focus is primarily on consideration of how best to estimate costs.

5.2. Aims

The principal aim was to determine if an economic evaluation of a cooking skills intervention is feasible using the same or similar methods of data collection explored here. Specifically, we sought to identify practical and methodological issues that are likely to affect the success of a definitive trial, such as non-compliance with data collection methods. We aimed to do this by:

- Piloting a template for collecting cost data from the JOMoF centres
- Piloting the collection of receipts on total weekly food expenditure
- Piloting a questionnaire to collect self-reported data on weekly food expenditure inside and outside of the home and kitchen equipment expenditure.

The analysis should also shed light on whether participation in the cooking skills intervention may change participant's food expenditure patterns, compared with non-participants, and will help inform an economic evaluation in a definitive RCT.

There was no *a priori* definition of what would constitute a 'feasible' rate of each of the above because of the lack of precedent for an RCT of a cooking skills intervention – each rate was assessed separately and discussed amongst the project team to make a decision about whether such a rate would be acceptable for a definitive trial.

5.3. Methods

5.3.1. Data Collection Methods

A template was developed to collect the costs required to deliver the intervention. The template outlined information on resource use, relevant unit costs for the staff required to deliver the intervention, food and equipment costs of running the intervention, along with an estimate of the cost of the facilities (i.e. the training kitchen). This template was then completed at the four sites: Newcastle, Bradford, Stratford, and Leeds.

The costs to participants of weekly food expenditure in the home and outside of the home as well as kitchen equipment expenditure were collected by a participant completed questionnaire at baseline and at four week follow-up. Participants were asked to report their weekly expenditure on food consumed outside of the home, household size, if they lived in a shared house, and weekly expenditure on groceries including non-food items, where participants normally did their shopping,

and how much they spent on specific food items taken from the Consumer Price Index of the 100 most commonly consumed foods in the UK.¹⁴⁵ More details on the questions can be found in the study questionnaire (see appendix).

To validate the collection of these self-reported measures, participants were asked to provide receipts for their food shopping for one week at both baseline and follow-up.

5.4. Results

5.4.1. Costs of delivering the intervention

In this section we outline how the requested data was provided for the costs of delivering the intervention and costs to participants. Given the data that we were able to collect, we make suggestions on how the data collection could be improved for a definitive trial.

Collecting this data proved very challenging. The level of detail provided by each of the centres varied substantially. Because of the heterogeneity in data collection we cannot provide a reliable estimate of the likely costs of delivering the intervention to inform a definitive trial. However, the feasibility study provided us with a good starting point for designing a template to collect costs in a definitive trial. Table 28 shows a summary of the cost data collected from all four sites.

From the data collection in the feasibility study, we learned that the template for collecting costs on delivering the intervention needed to be slightly revised. The development of a revised template was partially informed by the data provided by the Leeds centre. Table 29 shows a revised template for collecting cost information which could be used in a definitive trial.

Table 28: Intervention cost Data collected from the three sites (no data available for Stratford)

	Newcastle	Bradford	Leeds
Cost of rent of premises (annual)	Not provided	£17,000.00	£17,267.00
Costs of utilities and council tax (annual)	Not provided	Not provided	£7867.00
Kitchen equipment (initial set up)	No information on small equipment. Basic information of large equipment (e.g. number of ovens, microwaves, fridge/freezers)	No information on small equipment. Basic information of large equipment (e.g. number of ovens, and microwaves)	Detailed information on the make model and quantity. No information on costs provided.
Staff Costs (annual)	7 individuals to deliver cooking skills work, although all staff have a range of duties over a number of programmes delivered by Food Nation therefore impossible to associate staff cost to intervention programme.	1 full time manager, 1 part time permanent and 5 casual workers. No salaries or employee costs were provided	£65,551 (employed 6 people unknown if full or part-time.
Training (annual)	Not provided	Not provided	£1000 per annum
Recipes and Ingredients (annual)	Average cost per participant per week £2.50-£3.00	£7000 per annum	Average cost per participant per week £3.00
Course Frequency	25-30 course per year for an average of 8 participants.	Average 6 participants per course. 360 course completed since centre opened	50-60 course per year for between 5-7 participants
Length of course	Not provided	8 or 10 weeks	10 weeks
Advertising Costs (annual)	£15,000 per annum (includes other cooking skills course)	Not provided	£1250 per annum

Table 29: Revised cost template

Annual costs of Premises:						
	Rent	Utilities	Maintenance			
Training Costs:						
	Funding available for Jamie Oliver Ministry of Food Training?	Other training costs (e.g. statutory, Food Hygiene etc.)				
Kitchen Equipment:						
	Item description	Make	Model	Quantity	Price	How often renewed
Staff costs (annual):						
	Number and pay grade/cost of staff in involved in course preparation	Time spent in course preparation	Number and pay grade/cost of staff delivering each session	Number and pay grade/cost of staff involved in managing JOMoF centre		
Course Information:						
	Number of courses run each year	Number of sessions in each course	Length of each cooking class session	Number of participants in each course	Preparation time for each course session	
Recipe and Ingredients:						
	Week 1:	Recipe	Ingredients	Total Dish Cost	Cost per person	
	Week 2:	Recipe	Ingredients	Total Dish Cost	Cost per person	
	(etc. for each week of the course)	Recipe	Ingredients	Total Dish Cost	Cost per person	

5.4.2. Costs to Participants

5.4.2.1. Response Rates and Number of observations

Table 30 shows the number of observations and response rates of participants providing information on the different expenditure related variables. The response rates between treatment and control group were reasonably similar for all the variables with the possible exception of food expenditure

receipts. At follow-up approximately 44% of respondents who provided receipt information at baseline provided receipt information at follow-up. Similarly, at follow-up approximately 70% of respondents provided self-reported expenditure data if they had provided this data at baseline.

Table 30: Number of observations (Response rates (%)).

	Intervention		Control	
	Baseline ^a N=37	Follow-up ^b N=27	Baseline ^a N=35	Follow-up ^b N=29
Food expenditure receipts	25 (68)	11 (44)	18 (51)	9 (50)
Self-reported food expenditure inside of the home	36 (97)	24 (67)	34 (97)	24 (71)
Self-reported food expenditure outside of the home	36 (97)	23 (64)	33 (94)	25 (76)
Kitchen equipment expenditure	36 (97)	26 (72)	34 (97)	26 (76)

- a. Response rates at baseline are calculated as the proportion of individuals in either intervention or control group out of all participants in the respective group to provide the appropriate information.
- b. Response rates at follow-up are calculated as the proportion of individuals in either intervention or control group out of all participants in the respective group who had already provided the appropriate information at baseline in order to capture some indication for compliance.

5.4.2.2. Costs to Participants

Table 31 shows sample sizes and mean costs and 95% confidence intervals of expenditure data for the treatment and control group at follow-up and baseline. There is a lot of variation in the data. The confidence intervals with the small sample sizes do not allow for any meaningful interpretation of the results. This data provides some basic cost information to inform the development of a definitive trial.

Table 31: Costs to Participants (£)

	<u>Intervention</u>		<u>Control</u>	
	<i>Baseline</i>	<i>Follow-up</i>	<i>Baseline</i>	<i>Follow-up</i>
Out of home food expenditure (self-reported)	(n=36) 22 (15, 29)	(n=23) 27 (14, 41)	(n=33) 21 (13, 28)	(n=25) 29 (16, 42)
At home food expenditure:				
Self-reported	(n=36) 58 (46, 70)	(n=24) 61 (48, 75)	(n=34) 69 (54, 84)	(n=24) 53 (41, 67)
Receipts	(n=25) 82 (64, 101)	(n=11) 66 (42, 90)	(n=18) 102.00 (49.00, 156)	(n=9) 80 (38, 122)
Cost of kitchen equipment purchased	(n=36) 13 (7, 20)	(n=26) 13 (4, 22)	(n=34) 6 (2, 10)	(n=26) 10 (4, 16)

5.5. Discussion

The primary aim of this work package was to assess the feasibility and practicality of the proposed methods for an economic evaluation of the cooking skills intervention and provide some guidance on the likely costs associated with the intervention for the centres and participants to inform a definitive trial.

5.5.1. Summary of principal findings

The attempt to collect data from all of the sites was not universally successful as the different centres did not provide appropriate data. This meant that with the data collected we cannot provide a feasibility estimate of possible costs associated with delivery of the intervention to inform a definitive trial. What we can do is use the information collected to inform data collection in a definitive trial. Some of the required information could be obtained by using a revised template as shown in Table 29.

5.5.2. Strengths and limitations

The data collection for this work package was part of the overall data collection for the pilot RCT, rather than a standalone data collection activity, therefore the data that were collected from participants are likely a good estimate of what might be collected in a definitive trial. However, the lack of data obtained from the centres in relation to their operating costs limits any estimates that can be provided in planning for a definitive trial.

We were unable to gain estimates from the Centres that delivered courses other than as part of JOMoF of the proportion of their costs that could be attributed to the JOMoF courses. We were also unable to gain clarity about the heterogeneity of funding sources for the each of the courses. These details of funding and costs will need to be pursued further in a definitive trial.

5.5.3. Interpretations and conclusions

We have developed the following recommendations for data collection for a definitive trial:

- **Cost of rent on premises and utilities:** Collecting this information seemed feasible and should be included in data collected during the definitive trial. These data are collected at centre/site level.
- **Kitchen Equipment:** The data collected from Leeds provided a good starting point for revising the template to collect information on the item description, model, make, and quantity. Consideration could be given to omitting lower cost items from data collection and focusing on items that make up a greater proportion of total cost. This would reduce the burden on sites. Information on cost items not collected from each site could either be based upon the data collected from Leeds in the feasibility trial or based on a focused piece of micro costing at a single site. Which approach is adopted would depend upon the likely magnitude of costs to be estimated. Rather than estimating site specific costs for these resources it is suggested that an explicit set of standard 'unit' prices are used. These would be assembled by the analyst from other sources. The purpose of this approach is to provide an illustrative set of costs that, while not directly applicable to any one site, would readily allow the cost data to be adjusted to reflect local conditions.
- **Staff costs:** For a definitive trial, we would need to collect more specific information related to staff time inputs into each course as is reflected in the revised template in Table 29. Staff

time inputs would need to take into account time required to deliver the sessions as well as time required before and after each session for preparation etc.

- **Training:** In the pilot data collection, none of the centres were able to provide training costs associated with delivering the intervention. For the definitive trial, the research team could liaise with the JOMoF head office which should have the required data. Assumptions would be required on how often training might need to be repeated to ensure staff maintain skills.
- **Recipe and Ingredients:** The information provided by Leeds provided a good starting point for revising the information requested from each centre. If not all sites were able to provide the requested costs an illustrative set of costs utilising the information collected in the feasibility trial and data collected in the definitive trial would be used to estimate costs that could be revised to reflect local conditions.
- **Course Frequency and Length of Course:** The information required for a definitive trial is shown in the revised template in Table 29.

Participant Costs

The response rates for self-reported expenditure were reasonably high (70%) in both the control and treatment groups suggesting that this is a feasible method for data collection which could be used in a definitive trial. Mean costs from this data show significant variation.

Validation of the self-reported expenditure data through the use of receipts proved to be a bit more challenging as response rates were lower at 44%. However, this rate is consistent with other studies that have elicited receipt data from participants, when controlling for participation rates into the study from the total eligible population. Receipt collection rates in the literature range from 20% to 70%.^{30 31} The ranges overlap for the self-reported data and receipts suggesting that for a definitive trial self-reported cost data may be sufficient to capture the costs associated with the intervention.

The feasibility study provided useful information for the development of data collection tools for an economic evaluation in a definitive trial. Specifically we have identified approaches to limit the burden of data collection falling on participants and centres. These approaches should allow the required cost data to be collected and minimise missing data and loss to follow-up of participants and centres.

VI Overall discussion and conclusions

In this section, each of the research questions is stated and addressed, based on the findings from each of the discrete work packages.

WP1 – explore the prevalence of cooking skills in the UK, and associations between cooking skills and diet quality and body weight

1. What proportion of the UK adult population report poor or limited cooking skills?

Our analysis of data from the UK's NDNS suggests that, based on the measures used, a majority of the UK adult population do not have poor cooking skills. Nine out of ten respondents reported that they were confident at boiling, grilling, or oven baking or roasting foods, and at least three quarters of respondents were confident at using the remaining techniques that were asked about; these were steaming, frying, stir-frying, stewing and microwaving. Just under 90% of respondents said that they could prepare a main dish from basic ingredients without needing help from another person, with women more likely to report that they could this than men.

However, measuring cooking skill is difficult, not least because of the potential for social desirability biases when asking such questions. For example, a person may report that they can boil foods *per se*, but this does not necessarily mean they can prepare a whole meal with confidence using various techniques and timings, or that they have the confidence to boil different types of foods. The question that asked about preparing a main meal from basic ingredients gave only two meal types as examples, which were arguably very simple meals. Therefore, it is possible that these data may overestimate the prevalence of cooking skills in the UK, and that there remains a sizeable minority of adults who have poor or limited cooking skills. This was reinforced by our baseline questionnaire findings in WP3.

2. What are the socio-demographic characteristics of UK adults reporting poor cooking skills?

There were some inconsistent socio-economic differences across the responses to questions that were asked in order to gauge cooking skill. These differences suggest that men, younger adults, and those from lower socio-economic groups may be more likely to report poorer cooking skills. Nonetheless, despite some evident differences, overall confidence was high.

Despite being weighted for non-response, these estimates of prevalence may be affected by the relatively small number of respondents. In breaking down the small number of respondents to compare across smaller subgroups, any genuine differences between socio-economic groups may not have been detected. Arguably, larger, more effective population monitoring of cooking skills and cooking behaviour is needed in order to be able to determine any socio-economic differences with greater precision.

3. Is there a relationship between poor cooking skills in UK adults and either diet quality or body weight, after taking into account of socio-economic variables such as age, gender and socio-economic position?

4. Does any relationship between poor cooking skills and diet quality or body weight vary according to socio-demographic variables such as age, gender and socio-economic position?

Due to the high prevalence of self-reported cooking skills, and relatively small sample from whom data were collected in respect of cooking skills, it was not possible to model any relationships between cooking skills and either diet quality or body weight.

WP2 – establish whether the intervention is feasible and worth evaluating

5. What is the theoretical basis, in terms of behaviour change, of the JOMoF cooking skills intervention?

The cooking skills intervention employs some specific BCTs that may contribute to its potential effectiveness at changing participants' cooking and eating behaviours, although these are used mostly without instructors being aware that they are being used. Given its practical nature, the most common techniques that were observed were those centred on provision of instruction and demonstration of cooking skills and techniques. Some other BCTs were used, albeit less consistently. We have suggested that BCTs be formalised within the course manual and instructor training program, so that those that are already commonly used can be employed in a more structured and replicable way; we have also suggested some additional BCTs which could be used in order to maximise the potential effectiveness of the intervention. Increasing awareness of BCTs and their potential among instructors will be an important addition to their training programme.

6. What is the fidelity of the JOMoF cooking skills intervention?

7. Are there temporal or locational variations in intervention fidelity?

Analysis of the course manual, followed by in-person observations of intervention sessions, have shed light on what the core components of the programme are and the aspects of the course content and structure that are more variable, both within and between centres. We have established that the teaching of practical cooking skills and cooking techniques form the basis of the intervention and that the delivery of these has little variation. Beyond this core component, there is greater variability. The teaching of key nutrition messages is the second largest component of the course, and is designed to focus on simple, key messages around fat, sugar, salt, portion sizes and the balanced plate. In practice, the delivery of these messages varied depending on both site and instructor, with some instructors embellishing the material or choosing to emphasise certain aspects over others.

The other, less prominent, aspects of the course are messages around food ethos, shopping and budgeting, and the benefits of cooking *per se*. These occupied a much smaller proportion of overall class time than the core and secondary instruction around cooking skills and nutrition.

The use of BCTs also varied both between and within centres. Formalising and standardising the use of BCTs would allow course trainers to be made aware of the specific things that are more likely to lead to a change in participants' behaviour; many of these are already being used but without instructors being aware. By formalising these BCTs, and incorporating them into the course in a more structured way, this is likely to improve fidelity of the intervention and also improve the likelihood that all participants, irrespective of site or instructor, are receiving the same 'active ingredients' of the intervention. To this end, we have also made some further recommendations around nutrition messages, suggesting that instructors focus on the basic, core nutrition messages, and that these messages are incorporated in a more structured way that tie in with each particular class topic. This will mean that all participants receive broadly the same basic nutrition education, and that additional, potentially confusing or contradictory messages, are avoided.

WP3 – establish whether the methods proposed for a definitive RCT are feasible, and whether both the methods and the intervention itself are acceptable to participants and stakeholders

8. *What are the baseline self-reported cooking skills and socio-demographic characteristics of participants of a cooking skills intervention?*
9. *How do the baseline self-reported cooking skills and socio-demographic characteristics of wait-list recruits compare to community recruits*
10. *Do the socio-demographic characteristics of community wait-list recruits align with those identified as most in need of cooking skills interventions from research questions 1-4?*

Initially, it was planned that recruitment would be split between two methods: community recruitment and wait-list recruitment (see section 0 for further explanation). However, it became apparent during the early stages of recruitment that recruitment from the community would be the only feasible method for a definitive trial. As only a small number of participants (8 out of 80) were recruited via the wait-list method, we have not been able to make any meaningful comparisons of socio-demographic characteristics between the two recruitment methods. However, based upon the data from this small number of participants, and some further data that JOMoF have shared with us (not presented in this report), there is a suggestion that the current socio-demographic profile of participants who self-select for the intervention does not exactly align with those who are most in-need; they are more likely to be female and from higher socio-economic groups. However, this does not necessarily mean that those who self-select to the intervention are, indeed, not in-need.

The socio-demographic characteristics of those who were recruited from the community more closely aligned with those who had been identified as most in-need from WP1. Around two-thirds of those recruited were male and four-fifths were from the two most deprived quintiles of deprivation. In terms of baseline cooking skill, around a half of participants reported that they could prepare a main meal from scratch, without help. This compared favourably with the findings from WP1, which found that, at the population level, around 90% of respondents reported being able to prepare a main meal from scratch, without help. We are therefore confident that the piloted recruitment strategy was successful at recruiting those in-need of a cooking skills intervention.

11. *What are the consequences, both expected and unexpected, of cooking skills interventions for UK adults, as identified by cooking skills intervention participants?*

Based on the qualitative work that was undertaken, there were a number of perceived benefits and impacts of having taken part in the cooking skills course. The perceived benefits depended on the participant's baseline skill and knowledge and their motivations for taking part. For those participants who started with little or no experience of cooking, the knowledge of how to carry out simple tasks, such as poaching an egg or chopping an onion, appeared to be appreciated by participants, and empowering to an extent. Those participants who started with greater baseline knowledge appeared to experience slightly different benefits from taking part in the course, such as an increased motivation to cook from scratch, improved ingredient knowledge and more ideas and inspiration for dishes to prepare. Participants talked about preparing foods in different ways after taking part in the course, for example using fewer pre-prepared and processed foods and using healthier cooking techniques and ingredients. However, not all participants reported a wholesale

change in the way that they prepared food; some admitted to still using some 'short-cuts' and incorporating a mix of both pre-prepared and fresh ingredients and dishes.

Participants also talked about other perceived impacts. For example, some participants mentioned that they were paying more attention to food labels, both in terms of nutrition and provenance, were attempting to shop in different places and were also seeking better value for money. Some participants also mentioned the social benefits of taking part.

12. How practical and acceptable are cooking skills interventions for UK adult participants as well as those involved in commissioning and delivery?

Overall, participants reported that they were satisfied with the delivery and content of the cooking skills intervention. Participants commented that the pacing of the class was, overall, acceptable, that the balance between instruction and practice was good, and that the instructors were friendly and knowledgeable. Some participants felt that perhaps the beginning of the course was a little slow, while others felt some of the later classes were a little rushed; this perhaps reflects the different levels of skill and baseline knowledge that participants possessed.

The timing and location of classes were acceptable to most participants, although some participants who worked shifts found that missing certain classes was inevitable because of varying shift patterns. During recruitment in workplaces where shift work was common, many potential participants were deterred from taking part because of the perception that a course with a fixed day and time was incompatible with their variable shift patterns. This aspect of acceptability has been discussed with JOMoF who may, in readiness for a definitive trial, seek to overcome some of these practical barriers to participation for this particular group of people.

Stakeholders of the intervention also found the course both practical and acceptable. Stakeholders acknowledged the need for structure and replicability of the key aspects of the intervention, although felt that there was sufficient flexibility to incorporate the needs and backgrounds of different participants and different instructors. Stakeholders also recognised that the course had developed throughout the duration of its existence, beginning as a course focused almost exclusively on cooking skills, to one that now incorporated a greater amount of nutrition education.

13. How practical and acceptable are the research methods proposed for a definitive RCT of a multi-site cooking skills intervention, for both UK adult participants as well as those involved in commissioning and delivery?

The research methods were received favourably by both participants and stakeholders. Most participants had either enjoyed or had neutral opinions towards the data collection tasks that they were asked to do. In some cases, participants admitted to an element of 'guesswork' in completing food records, and some also discussed how the act of completing a food record may have made them pay greater attention to their diet.

The extent of missing data was low: the majority of participants completed questionnaires fully, or with very minor omissions, and provided full dietary data. Participants provided dietary data either by completing a 3-day food diary, or taking part in three 24-hour recall interviews either by telephone or in-person. We aimed to pilot both methods to see which would be the most feasible for use in a definitive trial in the target population groups. Both methods were comparable in terms of dietary markers measured, although the 24-hour recall method was slightly more resource intensive

on the part of the researcher; nonetheless, this difference was only small. Thus, given the lower burden on participants, reduced likelihood for literacy issues, potentially lower likelihood of direct impact on people's diet, and the likelihood of better quality of data, we recommend the use of 24-hour recall interviews in a definitive trial.

Whilst we had anticipated that some participants may reject their allocated arm and wish to take part in the cooking skills intervention sooner (if allocated to the control arm), the rate of successful randomisation and allocation was better than expected, with 94% of participants accepting their allocation. Those who rejected their allocated arm gave reasons including wanting to do the course with a friend, or the course date now conflicting with other events, such as exams or holidays.

Retention of participants was also better than anticipated, with 69% of participants retained at follow up, or 31% lost to follow-up. Most participants who were lost to follow-up were not contactable and did not provide reasons for no longer continuing.

Stakeholders did not report that they found the research methods to be problematic or disruptive to their regular operations. In some cases, stakeholders said that the recruitment methods used helped them to access participants with whom they may not have previously have engaged. Thus our recruitment methods may also influence longer term strategies for recruitment to JOMoF courses.

14. What factors may affect non-recruitment, attrition, attendance and compliance with data collection methods?

During recruitment, certain factors were noted that may deter potential participants from taking part or continuing in the study. For example, when recruiting in workplaces where shift work was commonplace, some individuals were deterred from participating because of the difficulty in accommodating the intervention classes which occur at the same day and time each week. This was also a reason why some shift workers, who did choose to take part, were not able to attend all of the intervention sessions. For those with greater flexibility to attend, the various course times and days available meant that, overall, the course was accessible to most.

Arguably, individuals who choose to participate had at least some interest in food, or in learning to gain or improve their cooking skills. Hence, there will always be an inherent difficulty in making the intervention appealing to everybody who could benefit. A recruitment strategy for a definitive trial could therefore seek to promote other potential benefits of taking part, beyond purely cooking skills, for example, the potential to save money and experience social benefits.

Attrition and attendance may be influenced by impractical course timings, particularly for those working shift patterns as mentioned. Some participants may not enjoy the course as expected, while others may miss classes for other reasons and feel that they may not be able to catch up. Some participants may find the data collection tasks too onerous, although this was not a major concern for participants in the qualitative work that was undertaken.

Compliance with data collection tasks, particularly the provision of dietary information, was good. There will always be some challenges with data collection that requires participants to have to communicate with a researcher, as in the case of 24-hour recall interviews, but these challenges can be mitigated to some extent by making the process as simple and convenient for the participant as

possible. For example, participants can be given the option to be interviewed during evenings or weekends, and should feel comfortable to rearrange if necessary. Incentives for data collection may also improve compliance.

WP4 – establish whether the methods for economic evaluation of a definitive RCT are feasible

15. Is economic evaluation of a cooking skills intervention feasible?

We have established that economic evaluation of a definitive trial is feasible, but would need some changes to data collection procedures in order to ensure that the data required is obtained from both participants and stakeholders. Further development of methods for collection of grocery receipts, or recording of accurate grocery spend, would need to take place, and a template developed to facilitate collection of cost data from the intervention centres; this should be done in collaboration with JOMoF.

VII Recommendations for a definitive trial

This research aimed to establish whether a definitive evaluation of the JOMoF cooking skills intervention is feasible, using rigorous, randomised controlled trial methods. Previous evaluations of cooking skills interventions have faced methodological challenges which have limited the robustness and generalisability of their results. Particular uncertainties that needed to be resolved as part of this work were: whether those 'in-need' of cooking skills interventions could be identified and recruited; whether a wait-list RCT design would be feasible, both from participants' and stakeholders' perspectives; whether sufficient numbers of participants could be retained and be willing to provide data about cooking skills, diet and selected other domains; and whether the cooking skills course itself is a feasible intervention.

This work has mostly resolved these uncertainties. We have established that it is possible to identify, recruit and retain participants, using a wait-list RCT design, and using methods of data collection compatible with the outcomes that a definitive trial would be based upon. We have also established that the intervention itself is likely to be feasible, although may benefit from some changes that would potentially improve its effectiveness and fidelity, such as standardisation of BCTs and simplified nutrition messages; these changes have been discussed with JOMoF in a closed meeting and a wider engagement event involving all delivery centres and other stakeholders (see below), and any changes will precede a definitive trial.

However, whilst the proxy measures of cooking skills that were piloted – based on both validated and non-validated instruments – appeared to be at least partially effective in differentiating between levels of cooking skill and cooking confidence, these measures may need further development for use in a definitive trial, so that some of the nuances of perceptions of cooking 'from scratch' can be measured more accurately. For example, more sophisticated measurements could be used, in addition to the ones piloted, to understand how participants combine different types of cooking, and to further understand participants' confidence and proficiency at preparing specific recipes or composite dishes.

Sample size for a definitive trial

We have estimated the sample size for a definitive trial, based on findings from the pilot RCT. Our primary outcome measure is fruit and vegetable intake. The calculation is based on the variability in F&V intake in the ITT intervention group (which showed the highest intake at baseline and greatest variability). Using this, we estimate the standard deviation as 0.95 (from Inter-quartile range (IQR)/2). To detect a 0.5 portion (40g) increase in F&V consumption in the intervention group (which would be considered clinically significant) compared with the control group, with standard alpha error of 5% and 90% power would require 217 participants per group in a two arm RCT. This should inflate to 290 per group, to allow for 25% attrition. Thus, the overall sample size required would be 580.

A key question is, therefore, whether such a sample size would make a pragmatic, definitive trial feasible. Assuming four JOMoF centres remain open and fully functioning sustainably, we would need to recruit approximately 145 per centre, 78 each to the intervention and control groups. Given a pessimistic estimate each class could accommodate on average approximately 6 trial participants, we would need to identify 13 classes at each centre to take trial participants. Realistically, this might be feasible at one class per month, and thus take 13 months.

Dissemination event & stakeholder discussions

A dissemination event was hosted with stakeholders of the intervention and the research. The purpose of the event was to feed back the headline results of the study, discuss the implications of these, and elicit views around some of the aspects of a definitive trial that required further discussion.

The event was attended by representatives from each of the extant Ministry of Food centres, as well as representatives from JOFF, local authority health improvement teams, Department of Health, and academic project partners.

Recruitment

The question of the feasibility of community recruitment was discussed, and ways in which the JOMoF centres might be involved with recruitment or assist with the targeting of recruitment to those most in-need. The stakeholders discussed the potential of using frontline workers in third sector organisations who were working with particular target groups who may benefit. It was reported that in some areas this already occurs, albeit in the form of signposting to the JOMoF centres rather than recruitment per se. Related to this was also a suggestion of advertising the study to those who work with those who are more likely to be in-need, rather than direct recruitment. This method may remove some of the challenges in accessing and engaging with communities and community groups, but would need careful planning to ensure that those advertising the study on behalf of the research were aware of the research design, i.e. the possibility of being randomised to a wait-list control group.

The challenge of recruiting in workplaces where staff work shifts was also discussed. It was suggested that recruitment through workplaces could place participants onto specific courses for staff of that organisation; if there was enough interest, courses could be run at different times of the day and week, allowing those working variable shifts to attend at different times according to their availability. However, JOMoF centres may need additional resources to support this slightly different model of course operations. Alternatively, the research team and JOMoF centres could seek to engage with those within an organisation responsible for 'health in the workplace'. In doing so, it was suggested it may be possible for participants to be given 'time out' to attend intervention sessions.

Definitive trial & comparator

Stakeholders were interested in continuing their involvement in a definitive trial, and thought that the numbers needed to recruit (see sample size estimate above) were feasible, given that they would be divided across multiple sites and recruitment spread over a longer period, most likely over more than 12 months.

Of particular interest during the discussions were possible ideas for a comparator. Stakeholders felt that it may be too long to ask participants allocated to the wait-list control arm to wait for 12 months before being allocated to a course, echoing concerns of some participants in our qualitative interviews. There was some concern that this could damage the JOMoF brand somewhat or deter other people from the course (beyond those who take part as part of the research). However, some

suggestions were made as to possible comparator conditions that might be more acceptable to both participants and stakeholders. These included:

- Provision of the course materials in booklet form only (paper or web-based), or provision of a recipe book
- Access to a free, one-day taster course
- A specific incentive for those allocated to the control arm, for example, an ongoing cash incentive for waiting to take part
- An alternative, much less intensive cooking intervention, such as group cook and eat sessions where a one-pot dish is assembled by a group, whereby each person does one small task

It was noted that when individual centres had tried to follow up past participants at 12-months post course completion, that response rates had been very low.

Some stakeholders were also keen to measure the potential wider outcomes of the intervention, such as whether participants were buying more local food, and thus whether they may be any measurable benefit on the local economy.

BCTs and course content

Stakeholders discussed the potential for BCTs to be incorporated into the course in a more structured way than at present, and also responded to some of the additional BCTs that were proposed. Overall, stakeholders felt that the feedback regarding the course structure, particularly the feedback received as part of the qualitative work, was similar to feedback that some participants already provided.

Stakeholders accepted that occasionally there may be some recipes where more complex techniques or messages are not sufficiently broken down into manageable 'chunks' of information or practice suited to the group's abilities; refresher training and ongoing monitoring was seen as key to ensuring this. Stakeholders were very receptive to the idea of incorporating BCTs into training courses and the course manual. JOMoF centres thought that a good way to develop these and agree upon which BCTs might be used, and at what point in the course or class, would be to visit other centres and have networking events where all centres could share knowledge and good practice.

However, stakeholders from the JOMoF centres felt that the course needed to be flexible enough to incorporate the needs of different participant groups. For example, if a particular group had a stronger than usual interest in nutrition messages, it should be at the trainer's discretion as to whether they provide additional information beyond the core messages. It was also felt that this should be applicable to other messages too, such as food ethos, where some participants may have more of an interest.

Conclusions

The JOFF and JOMoF centres have indicated their willingness to work with the research team, to further optimise the intervention during the remainder of 2015, with a view to working together on a proposal for a definitive RCT application to be submitted in 2016. It is likely this will be submitted to

VIII Appendix

Table 32: (Supplemental Table A) confidence of main food provider in using eight cooking techniques, National Diet & Nutrition Survey, 2008-09, n=490

Variable & level	Boiling, % (95% CI)	Steaming, poaching, % (95% CI)	Frying, % (95% CI)	Stir frying, % (95% CI)	Grilling, % (95% CI)	Oven-baking, roasting, % (95% CI)	Stewing, braising, casseroling, % (95% CI)	Microwaving, % (95% CI)
All respondents	92.8 (89.7 - 95.0)	78.1 (73.8 - 81.9)	85.0 (81.3 - 88.1)	76.9 (72.6 - 80.7)	89.3 (85.9 - 92.0)	92.1 (89.0 - 94.4)	84.1 (80.3 - 87.3)	79.5 (75.3 - 83.1)
Gender								
Men	90.9 (86.0 - 94.2)	74.5 (67.7 - 80.3)	84.9 (79.1 - 89.2)	77.0 (70.5 - 82.5)	87.9 (82.8 - 91.7)	89.2 (84.0 - 92.8)	83.0 (77.1 - 87.6)	78.0 (71.6 - 83.2)
Women	94.6 (90.0 - 97.1)	81.5 (75.8 - 86.1)	85.1 (79.9 - 89.2)	76.8 (70.8 - 81.8)	90.7 (85.7 - 94.0)	95.0 (90.6 - 97.3)	85.2 (79.8 - 89.4)	81.0 (75.2 - 85.6)
$\chi^2_{df=489}$ (p-value)	1.78 (0.183)	2.89 (0.090)	0.004 (0.945)	0.004 (0.949)	0.78 (0.376)	4.24 (0.040)	0.38 (0.538)	0.58 (0.449)
Age (years)								
19-34	89.1 (81.2 - 93.9)	69.3 (59.8 - 77.4)	82.9 (74.6 - 88.9)	73.4 (64.0 - 81.2)	83.2 (74.7 - 89.3)	88.8 (80.6 - 93.7)	75.0 (65.8 - 82.3)	78.8 (69.2 - 85.9)
35-49	94.4 (88.0 - 97.5)	84.8 (76.8 - 90.4)	84.2 (76.4 - 89.8)	82.2 (74.3 - 88.0)	92.3 (85.9 - 96.0)	94.8 (89.2 - 97.6)	86.1 (78.6 - 91.2)	80.2 (72.7 - 86.0)
50-64	95.5 (90.3 - 98.0)	81.4 (72.5 - 88.0)	86.6 (79.8 - 91.3)	80.9 (73.0 - 86.9)	92.1 (86.4 - 95.6)	95.0 (89.8 - 97.6)	90.4 (84.4 - 94.3)	83.2 (75.6 - 88.8)
>64	92.5 (82.9 - 96.9)	77.1 (66.8 - 85.0)	87.1 (77.2 - 93.0)	69.6 (58.9 - 78.6)	90.3 (81.3 - 95.3)	89.7 (80.4 - 94.9)	86.5 (76.6 - 92.6)	75.0 (64.6 - 83.2)
$\chi^2_{df=489}$ (p-value)	1.23 (0.296)	2.85 (0.036)	0.32 (0.809)	2.05 (0.106)	2.25 (0.082)	1.61 (0.187)	3.81 (0.010)	0.67 (0.564)
NS-SEC								
Routine & manual	92.1 (86.4 - 95.5)	69.1 (61.3 - 76.0)	79.8 (72.6 - 85.4)	65.4 (57.3 - 72.7)	87.0 (80.7 - 91.5)	89.6 (83.9 - 93.4)	77.0 (69.5 - 83.0)	74.7 (67.1 - 81.0)
Intermediate	95.0 (85.4 - 98.4)	85.7 (76.5 - 91.7)	90.5 (81.8 - 95.2)	84.8 (75.5 - 91.0)	93.7 (85.2 - 97.4)	96.8 (87.3 - 99.3)	95.2 (86.9 - 98.3)	81.6 (71.9 - 88.5)
Managerial & prof.	92.3 (86.8 - 95.7)	81.9 (74.8 - 87.3)	86.3 (80.2 - 90.7)	82.8 (76.4 - 87.7)	89.4 (83.6 - 93.3)	92.4 (86.8 - 95.7)	85.5 (79.4 - 90.0)	83.2 (76.9 - 88.0)
$\chi^2_{df=489}$ (p-value)	0.33 (0.715)	5.29 (0.005)	2.62 (0.073)	8.55 (<0.001)	1.20 (0.301)	1.63 (0.197)	6.44 (0.002)	1.85 (0.158)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates p<0.01

Table 33: (Supplemental Table B) confidence of main food in cooking 10 foods, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Red meat, % (95% CI)	Chicken, % (95% CI)	White fish, % (95% CI)	Oily fish, % (95% CI)	Pulses, % (95% CI)	Dry pasta, % (95% CI)	Rice (savoury), % (95% CI)	Potatoes (not chips) , % (95% CI)	Fresh green veg, % (95% CI)	Root veg, % (95% CI)
All	87.3 (83.7 - 90.2)	90.8 (87.4 - 93.3)	82.1 (77.9 - 85.6)	72.7 (68.2 - 76.7)	63.0 (58.1 - 67.6)	84.5 (80.5 - 87.8)	86.8 (83.0 - 89.8)	92.7 (89.4 - 95.1)	93.0 (89.7 - 95.3)	90.5 (87.1 - 93.1)
Gender										
Men	88.0 (82.6 - 91.8)	89.6 (84.5 - 93.2)	80.2 (73.6 - 85.5)	69.3 (62.2 - 75.5)	60.5 (53.1 - 67.4)	80.0 (73.6 - 85.2)	83.5 (77.4 - 88.2)	91.0 (85.7 - 94.5)	89.8 (84.3 - 93.5)	88.6 (83.2 - 92.5)
Women	86.7 (91.4 - 90.6)	91.9 (87.0 - 95.0)	83.9 (78.5 - 88.1)	75.9 (70.1 - 80.9)	65.4 (58.8 - 71.4)	88.8 (83.7 - 92.5)	89.9 (84.9 - 93.4)	94.4 (89.5 - 97.1)	96.1 (91.4 - 98.3)	92.3 (87.5 - 95.4)
χ^2 df=489 (p-value)	0.15 (0.697)	0.56 (0.457)	0.91 (0.340)	2.37 (0.125)	1.01 (0.315)	5.75 (0.017)	3.46 (0.063)	1.33 (0.250)	4.71 (0.030)	1.47 (0.227)
Age (years)										
19-34	79.2 (70.5 - 85.9)	85.5 (77.4 - 91.0)	73.1 (63.7 - 80.9)	60.6 (50.7 - 69.7)	51.0 (41.0 - 60.9)	85.8 (77.2 - 91.6)	87.4 (79.4 - 92.6)	90.5 (82.0 - 95.2)	91.5 (83.4 - 95.8)	84.2 (75.5 - 90.2)
35-49	88.7 (81.1 - 93.5)	90.4 (83.0 - 94.8)	77.7 (68.9 - 84.5)	74.5 (65.9 - 81.6)	66.1 (57.2 - 73.9)	88.8 (80.8 - 93.8)	89.3 (81.2 - 94.2)	92.5 (84.5 - 96.5)	92.5 (84.5 - 96.5)	92.0 (84.8 - 96.0)
50-64	94.2 (88.9 - 97.0)	95.1 (89.7 - 97.7)	91.8 (85.8 - 95.4)	82.2 (74.7 - 87.9)	66.9 (57.3 - 75.2)	85.8 (78.0 - 91.1)	88.0 (80.5 - 92.8)	95.9 (89.6 - 97.6)	94.5 (89.1 - 97.3)	94.7 (89.8 - 97.4)
>64	88.2 (79.0 - 93.7)	93.3 (84.0 - 97.4)	88.7 (78.6 - 94.4)	75.3 (64.6 - 83.6)	70.6 (59.8 - 79.6)	75.3 (65.0 - 83.3)	80.9 (70.7 - 88.1)	93.5 (84.4 - 97.5)	93.9 (84.5 - 97.7)	92.1 (82.6 - 96.6)
χ^2 df=489 (p-value)	3.90 (0.009)	2.11 (0.099)	5.38 (0.001)	4.64 (0.003)	3.34 (0.019)	2.26 (0.081)	1.03 (0.376)	0.47 (0.694)	0.25 (0.855)	2.55 (0.057)
NS-SEC										
Routine	85.3 (78.8 - 90.1)	89.9 (83.9 - 93.8)	76.4 (68.5 - 82.8)	64.0 (55.9 - 71.4)	50.7 (42.6 - 58.8)	77.9 (70.3 - 84.1)	79.7 (72.3 - 85.5)	92.7 (86.7 - 96.2)	92.1 (86.0 - 95.6)	86.9 (80.5 - 91.5)
Intermediate	92.8 (84.6 - 96.8)	96.8 (88.1 - 99.2)	90.7 (82.5 - 95.3)	80.5 (70.9 - 87.5)	68.3 (57.0 - 77.8)	90.9 (82.0 - 95.6)	94.1 (86.0 - 97.6)	95.4 (83.5 - 98.8)	97.4 (87.6 - 99.5)	96.6 (87.0 - 99.2)
Managerial	86.5 (80.1 - 91.0)	88.3 (82.0 - 92.6)	83.1 (76.4 - 88.2)	77.0 (70.1 - 82.8)	71.2 (63.6 - 77.8)	85.6 (79.1 - 90.4)	88.5 (82.1 - 92.9)	90.9 (85.0 - 94.6)	92.0 (86.1 - 95.5)	90.9 (85.0 - 94.7)
χ^2 df=489 (p-value)	1.46 (0.232)	2.14 (0.119)	3.79 (0.023)	4.97 (0.007)	6.99 (0.001)	3.34 (0.036)	4.76 (0.009)	0.56 (0.560)	1.17 (0.312)	2.34 (0.098)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates p<0.01

Table 34: (Supplemental Table C) ability of main food provider to prepare four dish types without help, National Diet & Nutrition Survey, 2008-09, n=509

Variable & level	Convenience foods & ready meals, % (95% CI)	Complete meal from ready-made ingredients, % (95% CI)	Main dish from basic ingredients, % (95% CI)	Cake or biscuits from basic ingredients, % (95% CI)
All respondents	94.7 (91.8 - 96.5)	93.3 (90.4 - 95.4)	93.2 (90.2 - 95.4)	79.1 (94.9 - 82.8)
Gender				
Men	92.7 (88.1 - 95.5)	91.8 (87.2 - 94.9)	92.0 (87.1 - 95.1)	70.3 (63.4 - 76.4)
Women	96.6 (92.2 - 98.5)	94.7 (90.4 - 97.2)	94.4 (90.1 - 96.9)	87.6 (82.6 - 91.4)
$\chi^2_{df=489}(\text{p-value})$	2.55 (0.111)	1.28 (0.258)	0.90 (0.344)	19.02 (<0.001)
Age (years)				
19-34	92.2 (84.7 - 96.2)	91.9 (84.4 - 95.9)	90.4 (82.8 - 94.8)	75.0 (65.5 - 82.6)
35-49	96.4 (90.8 - 98.7)	95.4 (89.9 - 98.0)	93.0 (86.1 - 96.6)	80.8 (72.6 - 86.9)
50-64	96.3 (91.6 - 98.4)	94.5 (89.1 - 97.4)	97.0 (92.4 - 98.8)	82.5 (74.5 - 88.3)
>64	93.7 (84.5 - 97.6)	90.9 (81.8 - 95.7)	92.9 (84.2 - 97.0)	78.7 (68.6 - 86.2)
$\chi^2_{df=489}(\text{p-value})$	0.89 (0.441)	0.73 (0.530)	1.22 (0.301)	0.70 (0.552)
NS-SEC				
Routine & manual	96.3 (91.7 - 98.4)	93.8 (89.0 - 96.6)	94.4 (89.7 - 97.0)	78.3 (71.2 - 84.1)
Intermediate	97.1 (87.7 - 99.4)	97.9 (86.4 - 99.7)	94.4 (84.6 - 98.2)	78.0 (67.0 - 86.0)
Managerial & prof.	91.9 (86.3 - 95.4)	90.3 (84.5 - 94.1)	92.0 (86.4 - 95.4)	82.1 (75.5 - 87.1)
$\chi^2_{df=489}(\text{p-value})$	1.72 (0.181)	1.99 (0.142)	0.28 (0.744)	0.70 (0.497)

CI: confidence intervals; NS-SEC: National Statistics socio-economic classification; **bold text** indicates p<0.01

Table 35 (Supplemental Table D): List of behaviour change techniques¹⁸

Name of technique	Brief description
1. Provide information on consequences of behaviour in general	Information about the relationship between the behaviour and its possible or likely consequences <i>in the general case</i> , usually based on epidemiological data, and not personalised for the individual
2. Provide information on consequences of behaviour to the individual	Information about the <i>benefits and costs</i> of action or inaction to the individual or tailored to a relevant group based on that individual's characteristics (i.e. demographics, clinical, behavioural or psychological information). This can include any costs/benefits and not necessarily those related to health, e.g. feelings.
3. Provide information about others' approval	Involves information about what other people think about the target person's behaviour. It clarifies whether others will like, approve or disapprove of what the person is doing or will do.
4. Provide normative information about others' behaviour	Involves providing information about what other people are <i>doing</i> i.e. indicates that a particular behaviour or sequence of behaviours is common or uncommon amongst the population or amongst a specified group – presentation of case studies of a few others is not normative information.
5. Goal setting (behaviour)	The person is encouraged to make a behavioural resolution (e.g. take more exercise next week). This is directed towards encouraging people to decide to change or maintain change.
6. Goal setting (outcome)	The person is encouraged to set a general goal that can be achieved by behavioural means but is not defined in terms of behaviour (e.g. to reduce blood pressure or lose/maintain weight), as opposed to a goal based on changing behaviour as such. The goal may be an expected consequence of one or more behaviours, but is not a behaviour per se (see also techniques 5 (Goal setting – behaviour) and 7 (Action planning)). This technique may co-occur with technique 5 if goals for both behaviour and other outcomes are set.
7. Action planning	Involves detailed planning of what the person will do including, as a minimum, when, in which situation and/or where to act. 'When' may describe frequency (such as how many times a day/week or duration (e.g. for how long). The exact content of action plans may or may not be described, in this case code as this technique if it is stated that the behaviour is planned contingent to a specific situation or set of situations even if exact details are not present.
8. Barrier identification/problem solving	This presumes having formed an initial plan to change behaviour. The person is prompted to think about potential barriers <i>and</i> identify the ways of overcoming them. Barriers may include competing goals in specified situations. This may be described as 'problem solving'. If it is problem solving in relation to the performance of a behaviour, then it counts as an instance of this technique. Examples of barriers may include behavioural, cognitive, emotional, environmental, social and/or physical barriers. Breaking down the target behaviour into smaller easier to achieve tasks and enabling the person to build on small successes to achieve target behaviour. This may include increments towards target behaviour or incremental increases from baseline behaviour.
9. Set graded tasks	Involves a review or analysis of the extent to which previously set <i>behavioural</i> goals (e.g. take more exercise next week) were achieved. In most cases, this will follow previous goal setting (see technique 5, 'goal setting-behaviour') and an attempt to act on those goals, followed by a revision or readjustment of goals, and/or means to attain them.
10. Prompt review of behavioural goals	Involves a review or analysis of the extent to which previously set <i>outcome</i> goals (e.g. to reduce blood pressure or lose/maintain weight) were achieved. In most cases, this will follow previous goal setting (see technique 6, goal setting-outcome') and an attempt to act on those goals, followed by a revision of goals, and/or means to attain them.
11. Prompt review of outcome goals	Involves the person using praise or rewards <i>for attempts</i> at achieving a behavioural goal. This might include efforts made towards achieving the behaviour or progress made in preparatory steps towards the behaviour, but not merely participation in intervention. This can include self-reward.
12. Prompt rewards contingent on effort or progress towards behaviour	Reinforcing successful performance of the specific target behaviour. This can include praise and encouragement as well as material rewards but the reward/incentive must be explicitly linked to the achievement of the specific target behaviour i.e. the person receives the reward if they perform the specified behaviour but not if they do not perform the behaviour. This can include self-reward. Provisions of rewards for completing intervention components or materials are not instances of this technique. References to provision of incentives for being more physically active are not instances of this technique unless information about contingency to the performance of the target behaviour is provided.
13. Provide rewards contingent on successful behaviour	Contingent rewards are first provided for any approximation to the target behaviour e.g. for any increase in physical activity. Then, later, only a more demanding performance, e.g. brisk walking for 10 min on 3 days a week would be rewarded. Thus, this is graded use of contingent rewards over time.
14. Shaping	Once behaviour is performed in a particular situation, the person is encouraged or helped to try it in another situation. The idea is to ensure that the behaviour is not tied to one situation but becomes a more integrated part of the person's life that can be performed at a variety of different times and in a variety of contexts.
15. Prompting generalisation of a target behaviour	The person is asked to keep a record of specified behaviour(s) as a method for changing behaviour. This should be an explicitly stated intervention component, as opposed to occurring as part of completing measures for research purposes. This could e.g. take the form of a diary or completing a questionnaire about their behaviour, in terms of type, frequency, duration and/or intensity. Check the distinction between this and techniques 17 (prompt self-monitoring of behavioural outcome).
16. Prompt self-monitoring of behaviour	The person is asked to keep a record of specified measures expected to be influenced by the behaviour change, e.g. blood pressure, blood glucose, weight loss, physical fitness.
17. Prompt self-monitoring of behavioural outcome	Involves instructing the person to think about or list previous successes in performing the behaviour (or parts of it).
18. Prompting focus on past success	This involves providing the participant with data about their own recorded behaviour (e.g. following technique 16 (prompt self-monitoring of behaviour)) or commenting on a person's behavioural performance (e.g. identifying a discrepancy with between behavioural performance and a set goal – see techniques 5 (Goal setting – behaviour) and 7 (action planning) – or a discrepancy between one's own performance in relation to others' – note this could also involve technique 28 (Facilitate social comparison).
19. Provide feedback on performance	Involves telling the person about when and where they might be able to perform the behaviour this e.g. tips on places and times participants can access local exercise classes. This can be in either verbal or written form.
20. Provide information on where and when to perform the behaviour	Involves <i>telling</i> the person <i>how</i> to perform behaviour or preparatory behaviours, either verbally or in written form. Examples of instructions include; how to use gym equipment (without getting on and showing the participant), instruction on suitable clothing, and tips on how to take action <i>Showing</i> a person how to perform a behaviour without verbal instruction would be an instance of technique 22 only.
21. Provide instruction on how to perform the behaviour	Involves <i>showing</i> the person how to perform a behaviour e.g. through physical or visual demonstrations of behavioural performance, in person or remotely.
22. Model/Demonstrate the behaviour	

Name of technique	Brief description
23. Teach to use prompts/cues	The person is taught to identify environmental prompts which can be used to <i>remind</i> them to perform the behaviour (or to perform an alternative, incompatible behaviour in the case of behaviours to be reduced). Cues could include times of day, particular contexts or technologies such as mobile phone alerts which prompt them to perform the target behaviour. <i>The person</i> is prompted to alter the environment in ways so that it is more <i>supportive</i> of the target behaviour e.g. altering cues or reinforcers. For example, they might be asked to lock up or throw away or their high calorie snacks or take their running shoes to work. Interventions in which the interveners directly modify environmental variables (e.g. the way food is displayed in shops, provision of sports facilities) are not covered by this taxonomy and should be coded independently.
24. Environmental restructuring	
25. Agree behavioural contract	Must involve written agreement on the performance of an explicitly specified behaviour so that there is a written record of the person's resolution witnessed by another. Prompt the person to rehearse and repeat the behaviour or preparatory behaviours numerous times. Note this will also include parts of the behaviour e.g. refusal skills in relation to unhealthy snacks. This could be described as 'building habits or routines' but is still practice so long as the person is prompted to try the behaviour (or parts of it) during the intervention or practice between intervention sessions, e.g. as 'homework'.
26. Prompt practice	
27. Use of follow-up prompts	Intervention components are gradually reduced in intensity, duration and frequency over time, e.g. letters or telephone calls instead of face to face and/or provided at longer time intervals.
28. Facilitate social comparison	Involves explicitly drawing attention to others' performance to elicit comparisons.
29. Plan social support/social change	Involves prompting the person to plan how to elicit social support from other people to help him/her achieve their target behaviour/outcome. This will include support during interventions e.g. setting up a 'buddy' system or other forms of support and following the intervention including support provided by the individuals delivering the intervention, partner, friends and family.
30. Prompt identification as role model/position advocate	Involves focusing on how the person may be an example to others and affect their behaviour, e.g. being a good example to children. Also includes providing opportunities for participants to persuade others of the importance of adopting/changing the behaviour, for example, giving a talk or running a peer-led session.
31. Prompt anticipated regret	Involves inducing expectations of future regret about the performance or non-performance of a behaviour. This includes focusing on how the person will <i>feel</i> in the future and specifically whether they will feel regret or feel sorry that they did or did not take a different course of action. Do not also code instances of this technique as the more generic providing information on consequences (techniques 1 (provide information on consequences of behaviour in <i>general</i> and 2 (provide information on consequences of behaviour <i>to the individual</i>)).
32. Fear arousal	Involves presentation of risk and/or mortality information relevant to the behaviour as emotive images designed to evoke a fearful response (e.g. 'smoking kills!' or images of the grim reaper). Do not also code instances of this technique as the more generic providing information on consequences (techniques 1 (provide information on consequences of behaviour in <i>general</i>) and 2 (provide information on consequences of behaviour <i>to the individual</i>)).
33. Prompt self-talk	Encourage the person to use talk to themselves (aloud or silently) before and during planned behaviours to encourage, support and maintain action.
34. Prompt use of imagery	Teach the person to imagine successfully performing the behaviour or to imagine finding it easy to perform the behaviour, including component or easy versions of the behaviour. Distinct from recalling instances of previous success without imagery (technique 18 (prompting focus on past success)).
35. Relapse prevention/coping planning	This relates to planning how to maintain behaviour that has been changed. The person is prompted to identify in advance situations in which the changed behaviour may not be maintained and develop strategies to avoid or manage those situations. Contrast with techniques 7 (action planning) and 8 (barrier identification/problem solving) which are about initiating behaviour change.
36. Stress management/emotional control training	This is a set of specific techniques (e.g. progressive relaxation) which do not target the behaviour directly but seek to reduce anxiety and stress to facilitate the performance of the behaviour. It might also include techniques designed to reduce negative emotions or control mood or feelings that may interfere with performance of the behaviour, and/or to increase positive emotions that might help with the performance of the behaviour.
37. Motivational interviewing	This is a clinical method including a specific set of techniques involving prompting the person to engage in change talk in order to minimise resistance and resolve ambivalence to change (includes motivational counselling).
38. Time management	This includes any technique designed to teach a person how to manage their time in order to make time for the behaviour. These techniques are not directed towards performance of target behaviour but rather seek to facilitate it by freeing up times when it could be performed.
39. General communication skills training	This includes any technique directed at general communication skills but not directed towards a particular behaviour change. Often this may include role play and group work focusing on listening skills or assertive skills.
40. Stimulate anticipation of future rewards	Create anticipation of future rewards without necessarily reinforcing behaviour throughout the active period of the intervention. Code this technique when participants are told at the onset that they will be rewarded based on behavioural achievement.

Table 36 (Supplemental Table E): Count of missed questionnaire responses, based on those who returned the questionnaire

	Question	Baseline, n=70	Follow-up, n=52
Section 1	Number of people in household	0	2
	Shared housing	0	3
	Frequency of eating together at home	1	1
	Frequency of eating evening meal in front of TV	0	1
	Frequency of eating meal at dinner table	1	1
	Age last birthday	0	1
	Ethnic group	0	3
	Age leaving full-time education	2	3
Section 2	Cooking technique – boiling	0	0
	Cooking technique – steaming	0	0
	Cooking technique – frying	0	0
	Cooking technique – stir-frying	0	1
	Cooking technique – grilling	0	1
	Cooking technique – roasting	0	0
	Cooking technique – stewing	0	1
	Cooking technique – microwaving	0	1
	Confidence at cooking from basic ingredients	1	0
	Confidence at following a simple recipe	0	0
	Confidence at preparing and cooking new foods and recipes	0	0
	Confidence that what will cook will turn out well	0	0
	Confidence at tasting new foods	0	0
	Ability to prepare ready meal	0	0
	Ability to prepare meal from ready-made ingredients	0	0
	Ability to prepare meal from basic ingredients	0	0
	Ability to prepare cake/biscuits from basic ingredients	0	0
	Frequency of cooking main meal from basic ingredients	0	0
	Frequency of cooking main meal from pre-prepared ingredients	0	0
	Meal planning	0	0
Section 3	Food shopping responsibility	0	0
	Meal choice responsibility	0	0
	Cooking responsibility	0	0
	Number people prepare food for on weekday	1	1
	Equipment purchase – roasting tin	1	0
	Equipment purchase – saucepan	0	0
	Equipment purchase – frying pan	0	0
	Equipment purchase – whisk	0	0
	Equipment purchase – wooden spoon	0	0
	Equipment purchase – ladle	0	0
Section 4	Equipment purchase – slotted spoon	0	0
	Equipment purchase – knives	0	0
	Equipment purchase – jug	0	0
	Equipment purchase – scales	0	0
	Equipment purchase – colander	0	0
	Equipment purchase – chopping board	0	0
	Spend on food out-of-home	1	0
	Spend on all groceries	0	0
Section 6	Spend at large supermarket	0	0
	Spend at small supermarket	0	0
	Spend at discount supermarket	0	0
	Spend at frozen food shop	0	0
	Spend at large convenience shop	0	0
	Spend at small convenience shop	0	0
	Motivation – learn to cook quick, easy meals	0	7
	Motivation – have a healthier diet	2	5
Section 6	Motivation – try new recipes and foods	3	6
	Motivation – cook on a budget	3	6
	Motivation – learn new techniques	2	5
	Opinion as to whether will increase fruit & veg in next 12 months	0	0
	Food knowledge – vegetables	1	1
	Food knowledge – sugary foods	1	1
	Food knowledge – meat	0	1
	Food knowledge – starchy foods	1	1
	Food knowledge – fatty foods	0	1
	Food knowledge – high-fibre foods	1	1
	Food knowledge - fruit	0	1
	Food knowledge – salty foods	1	1
	Food knowledge – portions of fruit and veg	0	1
	Food knowledge – saturated fats	0	0
	Effects on health – food	1	0
	Effects on health – balanced diet	0	0
	Effects on health – exercise	0	0
	Effects on health – high fruit and vegetables	0	0
	Effects on health – fatty foods	0	0
	Effects on health – sugar	0	1
	Effects on health – fibre	0	0
	Effects on health – frying vs grilling	0	0
	Difficulties (all – count of missed sub-responses out of possible n x 21)	3	43
	Healthy eating statements – think about health	0	0
	Healthy eating statements – media	0	0
	Healthy eating statements – shops	0	0
	Healthy eating statements – information	0	0
	Influences on food (all – count of missed sub-responses out of possible 19)	2	3
	Healthy living – healthy choices	0	0
	Healthy living – willing to go out way	0	0
	Self-rated healthy eating score	1	0
	Self-efficacy – routine	1	1
	Self-efficacy – try several times	1	1
	Self-efficacy – rethink diet	1	1
	Self-efficacy – no support	1	1
	Self-efficacy – detailed plan	1	1
	Self-efficacy – detailed plan	1	1

Table 37 (supplemental Table F): Questionnaire question sources

Question no.	Domain	Source	Adapted?
1-01	Household composition	None	
1-02	Shared housing determiner	None	
1-03	Social connectedness	Flego et al. MoF Australia	No
1-04	Social connectedness	Flego et al. MoF Australia	No
1-05	Social connectedness	Flego et al. MoF Australia	No
1-06	Age	None	
1-07	Ethnic group	NDNS	No
1-08	Qualifications	NDNS	No
2-01	Cooking technique confidence	NDNS	No
2-02	Cooking confidence	Barton Questionnaire for Assessing Impact of Cooking Skills Programmes	Yes – layout adapted to questionnaire style, and additional option added to match Australia questionnaire
2-03	Cooking type skills	NDNS	No
2-04	Frequency of cooking from scratch	NDNS	No
2-05	Frequency of cooking from pre-prepared ingredients	NDNS	No
2-06 to 2-10	Meal planning	Anne Larvin MSc/FFH	Yes – additional options added for participant to say tasks are equally shared
3-01	Economics – items purchased recently	None	
4-01	Economics – expenditure	Living in Australia	Yes – wording adapted to be appropriate to UK
4-02	Economics – expenditure	Living in Australia	Yes – wording adapted to be appropriate to UK
4-03	Economics – shopping location	None	
5-01	Economics – expenditure on individual items	None	Food list taken from consumer price index of most commonly purchased foods in UK
6-01	Motivations for taking part in cooking skills course	Anne Larvin's MSc questionnaire	No
6-02	Intentions to eat healthy	Family Food & Health	No
6-03	Nutrition knowledge	Parmenter Nutrition Knowledge Questionnaire	No
6-04	Nutrition knowledge	Parmenter Nutrition	Yes – minor; added extra examples of fruit and veg

Question no.	Domain	Source	Adapted?
		Knowledge Questionnaire	
6-05	Nutrition knowledge	Parmenter Nutrition Knowledge Questionnaire	Yes – added in options for red meat
6-06	Effects of diet on health	Family Food & Health	No
6-07	Definition of term 'healthy'	None	Free text
6-08	Barriers to healthy eating	LIDNS	Yes – text of question and responses adapted slightly as original designed to be asked in person.
6-09	Opinions on healthy eating	HEPS	Yes – text of question adapted slightly as originally designed to be asked in person. Responses not amended.
6-10	Food choice attitudes and barriers	LIDNS	Yes – text of question and responses adapted slightly as original designed to be asked in person.
6-11	Healthy living attitudes	HEPS	Yes – very minor amendment to text of question as original designed to be asked in person.
6-12	Opinion of healthiness of diet	None	
6-13	Nutrition self-efficacy	Schwarz and Renner Nutrition Self-Efficacy	Yes – text and layout amended to fit with design of printed questionnaire. Also, wording altered slightly to make UK-friendly (designed in US)

IX References

1. Naruseviciute G, Whybrow S, Macdiarmid JI, McNeill G. Is “home cooked” healthier and cheaper than ready meals? *Proceedings of the Nutrition Society* 2015;74(OCE1):null-null.
2. Howard S, Adams J, White M. A cross-sectional comparative study of the nutritional content of supermarket ready meals and recipes from television chefs in the UK. *BMJ* 2012;(in press).
3. Wolfson JA, Bleich SN. Is cooking at home associated with better diet quality or weight-loss intention? *Public Health Nutrition* 2014;FirstView:1-10.
4. Monsivais P, Aggarwal A, Drewnowski A. Time Spent on Home Food Preparation and Indicators of Healthy Eating. *American Journal of Preventive Medicine* 2014;47(6):796-802.
5. Hartmann C, Dohle S, Siegrist M. Importance of cooking skills for balanced food choices. *Appetite* 2013;65:125-31.
6. Alkerwi Aa, Crichton GE, Hébert JR. Consumption of ready-made meals and increased risk of obesity: findings from the Observation of Cardiovascular Risk Factors in Luxembourg (ORISCAV-LUX) study. *British Journal of Nutrition* 2015;113(02):270-77.
7. van der Horst K, Brunner TA, Siegrist M. Ready-meal consumption: associations with weight status and cooking skills. *Public Health Nutrition* 2011;14(02):239-45.
8. Harnack L, Story M, Martinson B, Neumark-Sztainer D, Stang J. Guess Who's Cooking? The Role of Men in Meal Planning, Shopping, and Preparation in US Families. *Journal of the American Dietetic Association* 1998;98(9):995-1000.
9. Rees R, Hinds K, Dickson K, O'Mara-Eves A, J T. Communities that cook: a systematic review of the effectiveness and appropriateness of interventions to introduce adults to home cooking. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London., 2012.
10. Reicks M, Trofholz AC, Stang JS, Laska MN. Impact of Cooking and Home Food Preparation Interventions Among Adults: Outcomes and Implications for Future Programs. *J Nutr Educ Behav* 2014.
11. Adams J, Simpson E, Penn L, Adamson A, White M. Research to support the evaluation and implementation of adult cooking skills interventions in the UK: phase 1 report. Newcastle upon Tyne: Public Health Research Consortium, 2011.
12. Office for National Statistics. Datasets and reference tables, 2015.
13. Bates B, Lennox A, Swan G, editors. *National Diet and Nutrition Survey: Headline results from Year 1 of the Rolling Programme (2008/2009)*. London: Foods Standards Agency and Department of Health, 2010.
14. Stead M, Caraher M, Wrieden W, Longbottom P, Valentine K, Anderson A. Confident, fearful and hopeless cooks: Findings from the development of a food-skills initiative. *British Food Journal* 2004;106(4):274-87.
15. Short F. Domestic cooking skills - what are they? *Journal of the HEIA* 2003;10(3):14-22.
16. Caraher M, Lang T. Can't cook, won't cook: A review of cooking skills and their relevance to health promotion. *International Journal of Health Promotion and Education* 1999;37(3):89-100.
17. Wrieden WL, Anderson AS, Longbottom PJ, Valentine K, Stead M, Caraher M, et al. The impact of a community-based food skills intervention on cooking confidence, food preparation methods and dietary choices – an exploratory trial. *Public Health Nutrition* 2007;10(02):203-11.
18. Michie S, Ashford S, Sniehotta FF, Dombrowski SU, Bishop A, French DP. A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy. *Psychology & Health* 2011;26(11):1479-98.
19. Abraham CM, S. A taxonomy of behaviour change techniques used in interventions. *Health Psychology* 2007;27:379-87.
20. Michie S, Abraham, C., Eccles, M., Francis, J., Hardeman, W., Johnston, M. Strengthening evaluation and implementation by specifying components of behaviour change interventions: a study protocol. . *Implementation Science* 2011;6(10):doi:10.1186/748-5908-6-10.
21. Michie S, Richardson M, Johnston M, Abraham C, Francis J, Hardeman W, et al. The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. *Annals of behavioral medicine* 2013;46(1):81-95.

22. Moore G, Audrey S, Barker M, Bond L, Bonell C, Hardeman W, et al. Process evaluation of complex interventions: Medical Research Council guidance. In: Network MPHSR, editor. London, 2014.
23. Bellg AJ, Borrelli B, Resnick B, Hecht J, Minicucci DS, Ory M, et al. Enhancing treatment fidelity in health behavior change studies: best practices and recommendations from the NIH Behavior Change Consortium. *Health Psychol* 2004;23(5):443-51.
24. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. *Health Education Research* 2003;18(2):237-56.
25. Horner S, Rew L, Torres R. Enhancing Intervention Fidelity: A Means of Strengthening Study Impact. *Journal for Specialists in Pediatric Nursing* 2006;11(2):80-89.
26. Hawe P, Shiell A, Riley T. Complex interventions: how "out of control" can a randomised controlled trial be? *BMJ : British Medical Journal* 2004;328(7455):1561-63.
27. Breitenstein SM, Gross D, Garvey CA, Hill C, Fogg L, Resnick B. Implementation fidelity in community-based interventions. *Research in Nursing & Health* 2010;33(2):164-73.
28. Rees R, O'Mara A, Dickson K, Stansfield C, Caird J, Thomas J. Communities that cook: a systematic review of the effectiveness and appropriateness of interventions to introduce adults to home cooking [review protocol]. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London, 2011.
29. Herbert J, Flego A, Gibbs L, Waters E, Swinburn B, Reynolds J, et al. Wider impacts of a 10-week community cooking skills program - Jamie's Ministry of Food, Australia. *BMC Public Health* 2014;14(1):1161.
30. Monsivais P, Kirkpatrick S, Johnson DB. More nutritious food is served in child-care homes receiving higher federal food subsidies. *Journal of the American Dietetic Association* 2011;111(5):721-26.
31. Monsivais P, Perrigue MM, Adams SL, Drewnowski A. Measuring diet cost at the individual level: a comparison of three methods. *European journal of clinical nutrition* 2013;67(11):1220-25.
32. National Obesity Observatory. Adult Obesity and Socioeconomic Status. *NOO Data Factsheets*, 2012.
33. Beliveau R, Gingras D. Role of nutrition in preventing cancer. *Canadian Family Physician* 2007;53(11):1905-11.
34. Law M. Dietary fat and adult diseases and the implications for childhood nutrition: an epidemiologic approach. *American Journal of Clinical Nutrition* 2000;72(5 Suppl):1291S-96S.
35. de Leiris J, de Lorgeril M, Boucher F. Fish oil and heart health. *Journal of Cardiovascular Pharmacology* 2009;54(5):378-84.
36. Breslow JL. n-3 fatty acids and cardiovascular disease. *American Journal of Clinical Nutrition* 2006;83(6 Suppl):1477S-82S.
37. Hooper L, Summerbell CD, Thompson R, Sills D, Roberts FG, Moore HJ, et al. Reduced or modified dietary fat for preventing cardiovascular disease. *Cochrane Database of Systematic Reviews* 2012;5:CD002137.
38. Seal CJ. Whole grains and CVD risk. *Proceedings of the Nutrition Society* 2006;65(1):24-34.
39. Slavin J, Jacobs D, Marquart L. Whole-grain consumption and chronic disease: protective mechanisms. *Nutrition & Cancer* 1997;27(1):14-21.
40. Xi B, Huang Y, Reilly KH, Li S, Zheng R, Barrio-Lopez MT, et al. Sugar-sweetened beverages and risk of hypertension and CVD: a dose-response meta-analysis. *British Journal of Nutrition* 2015;113(05):709-17.
41. Keller A, Heitmann BL, Olsen N. Sugar-sweetened beverages, vascular risk factors and events: a systematic literature review. *Public Health Nutrition* 2015;18(07):1145-54.
42. Australian Government. National Food Plan: green paper. In: Department of Agriculture Fisheries and Forestry, editor. Canberra, 2012.
43. Department of Health. Healthy Lives, Healthy People: our strategy for public health in England. London: HM Government,, 2010.
44. Mela DJ. Determinants of food choice: relationships with obesity and weight control. *Obesity Reviews* 2001;9(Suppl. 4):249S-155S.

45. HealthKnowledge: expanding public health knowledge. Health and Social Behaviour: Social, behavioural and other determinants of the choice of diet. In: Team PHAS, editor. *Social, behavioural and other determinants of the choice of diet* 2011.
46. Lang T, Caraher M. Cooking Skills and Health. In: Health Education Authority, editor. London: Health Education Authority, 1999.
47. European Food Information Council. Can cooking skills be the key to health?, 2011.
48. Engler-Stringer R. Food, cooking skills, and health: a literature review. *Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en dietetique : une publication des Dietetistes du Canada* 2010;71(3):141-45.
49. Lyon P, Colquhoun A, Alexander E. Deskillng the domestic kitchen: national tragedy or the making of a modern myth? *Food Service Technology* 2003;3(3-4):167-75.
50. Meah A, Watson M. Saints and Slackers: Challenging Discourses About the Decline of Domestic Cooking. *Sociological Research Online* 2011;16(2):6.html.
51. Gatley A, Caraher M, Lang T. A qualitative, cross cultural examination of attitudes and behaviour in relation to cooking habits in France and Britain. *Appetite* 2014;75:71-81.
52. Berge JM, Hoppmann C, Hanson C, Neumark-Sztainer D. Perspectives about Family Meals from Single-Headed and Dual-Headed Households: A Qualitative Analysis. *Journal of the Academy of Nutrition and Dietetics* 2013;113(12):1632-39.
53. Rose D. Food stamps, the Thrifty Food Plan, and meal preparation: the importance of the time dimension for US nutrition policy. *Journal of Nutrition Education and Behavior* 2007;39(4):226-32.
54. Nelson M, Erens B, Bates B, Church S, Boshier T. Low Income Diet and Nutrition Survey: Volume 3, Nutritional status; physical activity; economic, social and other factors. London: Food Standards Agency, 2007.
55. Lyon P, Mattsson Sydner Y, Fjellström C, Janhonen-Abruquah H, Schröder M, Colquhoun A. Continuity in the kitchen: how younger and older women compare in their food practices and use of cooking skills. *International Journal of Consumer Studies* 2011;35(5):529-37.
56. Flego A, Herbert J, Gibbs L, Swinburn B, Keating C, Waters E, et al. Methods for the evaluation of the Jamie Oliver Ministry of Food program, Australia. *BMC Public Health* 2013;13(1):411.
57. Michie S, Johnston M, Francis J, Hardeman W, Eccles M. From Theory to Intervention: Mapping Theoretically Derived Behavioural Determinants to Behaviour Change Techniques. *Applied Psychology* 2008;57(4):660-80.
58. Michie S, Abraham C. Interventions to change health behaviours: evidence-based or evidence-inspired? *Psychology & Health* 2004;19(1):29-49.
59. Rees R, Hinds K, Dickson K, O'Mara-Eves A, Thomas J. Communities that cook: a systematic review of the effectiveness and appropriateness of interventions to introduce adults to home cooking. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London, 2012.
60. Vucic V, Glibetic M, Novakovic R, Ngo J, Ristic-Medic D, Tepsic J, et al. Dietary assessment methods used for low-income populations in food consumption surveys: a literature review. *British Journal of Nutrition* 2009;101(SupplementS2):S95-S101.
61. Cunningham SJ. An Introduction to Economic Evaluation of Health Care. *Journal of Orthodontics* 2001;28(3):246-50.
62. Public Health England. Local Health Profiles, 2014.
63. Adams J, Goffe L, Adamson A, Halligan J, O'Brien N, Purves R, et al. Prevalence and socio-demographic correlates of cooking skills in UK adults: cross-sectional analysis of data from the UK National Diet and Nutrition Survey. *International Journal of Behavioural Nutrition and Physical Activity* 2015;12:99. DOI 10.1186/s12966-015-0261-x.
64. Dowler E, Turner S, Dobson B. *Poverty Bites: Food, Health and Poor Families*. London: Child Poverty Action Group, 2001.
65. Lichtenstein AH, Ludwig DS. Bring back home economics education. *Jama* 2010;303(18):1857-8.
66. Pettinger C, Holdsworth M, Gerber M. Meal patterns and cooking practices in Southern France and Central England. *Public Health Nutrition* 2006;9(08):1020-26.

67. Brunner TA, van der Horst K, Siegrist M. Convenience food products. Drivers for consumption. *Appetite* 2010;55(3):498-506.
68. McLaughlin C, Tarasuk V, Kreiger N. An examination of at-home food preparation activity among low-income, food-insecure women. *J Am Diet Assoc* 2003;103(11):1506-12.
69. Larson NI, Perry CL, Story M, Neumark-Sztainer D. Food Preparation by Young Adults Is Associated with Better Diet Quality. *Journal of the American Dietetic Association* 2006;106(12):2001-07.
70. Laska MN, Larson NI, Neumark-Sztainer D, Story M. Does involvement in food preparation track from adolescence to young adulthood and is it associated with better dietary quality? Findings from a 10-year longitudinal study. *Public Health Nutr* 2012;15(7):1150-8.
71. Herbert J, Flego A, Gibbs L, Waters E, Swinburn B, Reynolds J, et al. Wider impacts of a 10-week community cooking skills program--Jamie's Ministry of Food, Australia. *BMC Public Health* 2014;14:1161.
72. Flego A, Herbert J, Waters E, Gibbs L, Swinburn B, Reynolds J, et al. Jamie's Ministry of Food: Quasi-Experimental Evaluation of Immediate and Sustained Impacts of a Cooking Skills Program in Australia. *PLoS ONE* 2014;9(12):e114673.
73. Caraher M, Dixon P, Lang T, Carr-Hill R. The state of cooking in England: the relationship of cooking skills to food choice. *British Food Journal* 1999;101(8):590-609.
74. Virudachalam S, Long JA, Harhay MO, Polsky DE, Feudtner C. Prevalence and patterns of cooking dinner at home in the USA: National Health and Nutrition Examination Survey (NHANES) 2007-2008. *Public Health Nutr* 2014;17(5):1022-30.
75. Lake A, Hyland R, Rugg-Gunn A, Wood C, Mathers J, Adamson A. Food shopping and preparation among the thirty-somethings: whose job is it? (The ASH30 study). *British Food Journal* 2006;108:475-86.
76. Cawley J, Liu F. Maternal employment and childhood obesity: a search for mechanisms in time use data. *Econ Hum Biol* 2012;10(4):352-64.
77. Zick CD, Stevens RB, Bryant WK. Time use choices and healthy body weight: a multivariate analysis of data from the American Time Use Survey. *The international journal of behavioral nutrition and physical activity* 2011;8:84.
78. Lader D, Short S, Gershuny J. The Time Use Survey 2005, How we spend our time. London: Office for National Statistics, 2006.
79. Moser A. Food preparation patterns in German family households. An econometric approach with time budget data. *Appetite* 2010;55(1):99-107.
80. Furey S, McIlveen H, Strugnell C, Armstrong G. Cooking skills: a diminishing art? *Nutrition & Food Science* 2000;30(5).
81. Rose D. Food Stamps, the Thrifty Food Plan, and meal preparation: the importance of the time dimension for US nutrition policy. *J Nutr Educ Behav* 2007;39(4):226-32.
82. Mancino L, Newman C. Who has time to cook? How family resources influence food preparation. *USDA Economic Research Report* 2007;40:1-18.
83. Bates B, Lennox A, Prentice A, Bates C, Page P, Nicholson S, et al., editors. *National Diet and Nutrition Survey Results from Years 1, 2, 3 and 4 (combined) of the Rolling Programme (2008/2009 – 2011/2012)*. London: Public Health England, 2014.
84. Rose D, Pevalin D, O'Reilly K. *The National Statistics Socio-economic Classification: origins, development and use*. Hampshire: Palgrave Macmillan, 2005.
85. Hebert JR, Ma Y, Fau - Clemow L, Clemow L, Fau - Ockene IS, Ockene IS, Fau - Saperia G, Saperia G, Fau - Stanek EJ, 3rd, Stanek EJ, 3rd, Fau - Merriam PA, et al. Gender differences in social desirability and social approval bias in dietary self-report. (0002-9262 (Print)).
86. Barton KL, Wrieden W, Fau - Anderson AS, Anderson AS. Validity and reliability of a short questionnaire for assessing the impact of cooking skills interventions. (1365-277X (Electronic)).
87. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Quality and Safety in Health Care* 2005;14(1):26-33.
88. Armitage CJ, Conner M. Social cognition models and health behaviour: A structured review. *Psychology & Health. Special Issue: Methods and Models in Health Psychology* 2000;15(2):173-89.

89. Anderson AS, Cox Dn Fau - McKellar S, McKellar S Fau - Reynolds J, Reynolds J Fau - Lean ME, Lean Me Fau - Mela DJ, Mela DJ. Take Five, a nutrition education intervention to increase fruit and vegetable intakes: impact on attitudes towards dietary change. (0007-1145 (Print)).
90. Rayner J. Teenage cooks: a minority. London: The Guardian, 2011.
91. Jabs J, Devine CM, Bisogni CA, Farrell TJ, Jastran M, Wethington E. Trying to find the quickest way: employed mothers' constructions of time for food. *J Nutr Educ Behav* 2007;39(1):18-25.
92. Greaves C, Sheppard K, Abraham C, Hardeman W, Roden M, Evans P, et al. Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. *BMC Public Health* 2011;11(1):119.
93. Bandura A. Health Promotion by Social Cognitive Means. *Health Education & Behavior* 2004;31(2):143-64.
94. Sternberg RJ, Zhang L-f. *Perspectives on thinking, learning, and cognitive styles*: Routledge, 2014.
95. NHS Choices. The eatwell plate. In: NHS, editor, 2015.
96. Michie S, Abraham C, Whittington C, McAteer J, Gupta S. Effective techniques in healthy eating and physical activity interventions: a meta-regression. *Health Psychol* 2009;28(6):690-701.
97. Michie S, Jochelson K, Markham WA, Bridle C. Low income groups and behaviour change interventions: A review of intervention content, effectiveness and theoretical frameworks. *Journal of Epidemiology and Community Health* 2009.
98. Michie S. WHAT WORKS AND HOW? DESIGNING MORE EFFECTIVE INTERVENTIONS NEEDS ANSWERS TO BOTH QUESTIONS. *Addiction* 2008;103(6):886-87.
99. Loudon K, Treweek S, Sullivan F, Donnan P, Thorpe KE, Zwarenstein M. *The PRECIS-2 tool: designing trials that are fit for purpose*, 2015.
100. Cohen DJ, Crabtree BF, Etz RS, Balasubramanian BA, Donahue KE, Leviton LC, et al. Fidelity Versus Flexibility: Translating Evidence-Based Research into Practice. *American Journal of Preventive Medicine* 2008;35(5, Supplement):S381-S89.
101. Stead M, Stead M, Stradling R, Stead M, Stradling R, MacNeil M, et al. Implementation evaluation of the blueprint multi-component drug prevention programme: fidelity of school component delivery. *Drug and alcohol review* 2007;26(6):653-64.
102. Kwasnicka D, Pesseau J, White M, Sniehotta FF. Does planning how to cope with anticipated barriers facilitate health-related behaviour change? A systematic review. *Health psychology review* 2013;7(2):129-45.
103. Wlodkowski RJ. *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults*: John Wiley & Sons, 2011.
104. Knowles MS, Holton Iii EF, Swanson RA. *The adult learner*: Routledge, 2012.
105. Webb LT, Joseph J, Yardley L, Michie S. Using the Internet to Promote Health Behavior Change: A Systematic Review and Meta-analysis of the Impact of Theoretical Basis, Use of Behavior Change Techniques, and Mode of Delivery on Efficacy. *J Med Internet Res* 2010;12(1):e4.
106. Adriaanse MA, Vinkers CDW, De Ridder DTD, Hox JJ, De Wit JBF. Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence. *Appetite* 2011;56(1):183-93.
107. Dixon D, Johnston M. Health behaviour change competency framework: competences to deliver interventions to change lifestyle behaviours that affect health. *Scotland: NHS Health* 2010:1-46.
108. Daines J. *Adult Learning, Adult Teaching*: ERIC, 1993.
109. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. *Developing and evaluating complex interventions: the new Medical Research Council guidance*, 2008.
110. World Cancer Research Fund. Food, Nutrition and the Prevention of Cancer. Washington D.C.: American Institute for Cancer Research, 1997.
111. World Cancer Research Fund. Food, Nutrition, Physical Activity, and the Prevention of Cancer. Washington D.C.: American Institute of Cancer Research, 2007.
112. Johanson GA, Brooks GP. Initial Scale Development: Sample Size for Pilot Studies. *Educational and Psychological Measurement* 2010;70(3):394-400.
113. Nelson M, Erens B, Bates B, Church S, Boshier T. The UK Low Income Diet and Nutrition Survey (LIDNS) team: Dietetic Department, Kings College London.
114. Food Standards Agency. *McCance and Widdowson's The Composition of Foods*. Sixth Summary Edition ed, 2002.

115. MAFF. *Food Portion Sizes*. 2nd edition ed. London: HMSO, 1993.
116. McLennan D. et al. The English Indices of Deprivation 2010. In: Department of Communities and Local Government, editor. London, 2011.
117. Stata Statistical Software: Release 13. [program]. College Station, TX: StataCorp LP. , 2013.
118. Schulz K, Altman D, Moher D, for the Consort G. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. *Trials* 2010;11(1):32.
119. Forster M, Veerman JL, Barendregt JJ, Vos T. Cost-effectiveness of diet and exercise interventions to reduce overweight and obesity. *International Journal of Obesity* 2011;35(8):1071-78.
120. Lawe B. Teaching university students to cook, to improve their diet: A pilot study at Nottingham Trent University. *International Journal of Health Promotion and Education* 2013;51(3):161-68.
121. Warmin A, Sharp J, Condrasky MD. Cooking with a chef: A culinary nutrition program for college aged students. *Topics in Clinical Nutrition* 2012;27(2):164-73.
122. Garcia AL, Vargas E, Lam PS, Shennan DB, Smith F, Parrett A. Evaluation of a cooking skills programme in parents of young children – a longitudinal study. *Public Health Nutrition* 2014;17(05):1013-21.
123. Archuleta M, Vanleeuwen D, Halderson K, Jackson K, Bock MA, Eastman W, et al. Cooking schools improve nutrient intake patterns of people with type 2 diabetes. *Journal of Nutrition Education & Behavior* 2012;44(4):319-25.
124. Abbott PA, Davison JE, Moore LF, Rubinstein R. Effective nutrition education for Aboriginal Australians: lessons from a diabetes cooking course. *Journal of Nutrition Education & Behavior* 2012;44(1):55-9.
125. Johnson C, Hobson S, Garcia AC, Matthews J. Nutrition and food skills education for adults with developmental disabilities. *Canadian Journal of Dietetic Practice & Research* 2011;72(1):7-13.
126. Dasgupta K, Hajna S, Gougeon R. Impact of a cooking lesson-dietary education strategy on weight loss in overweight adults with type 2 diabetes. *Obesity* 2011;19:S113.
127. Leonard A, Hutchesson M, Patterson A, Chalmers K, Collins C. Recruitment and retention of young women into nutrition research studies: practical considerations. *Trials* 2014;15(1):23.
128. Sohanpal R, Hooper R, Hames R, Priebe S, Taylor S. Reporting participation rates in studies of non-pharmacological interventions for patients with chronic obstructive pulmonary disease: a systematic review. *Systematic Reviews* 2012;1(1):66.
129. Sully BGO, Julious S, Nicholl J. A reinvestigation of recruitment to randomised, controlled, multicenter trials: a review of trials funded by two UK funding agencies. *Trials* 2013;14(1):166.
130. Treweek S, Wilkie E, Craigie A, Caswell S, Thompson J, Steele R, et al. Meeting the challenges of recruitment to multicentre, community-based, lifestyle-change trials: a case study of the BeWEL trial. *Trials* 2013;14(1):436.
131. White A, de Sousa B, de Visser R, Hogston R, Madsen SA, Makara P, et al. The state of men's health in Europe. 2011.
132. Caldwell PHY, Hamilton S, Tan A, Craig JC. Strategies for Increasing Recruitment to Randomised Controlled Trials: Systematic Review. *PLoS Med* 2010;7(11):e1000368.
133. Treweek S, Lockhart P, Pitkethly M, Cook JA, Kjeldstrøm M, Johansen M, et al. Methods to improve recruitment to randomised controlled trials: Cochrane systematic review and meta-analysis. *BMJ Open* 2013;3(2).
134. Gray CM, Hunt K, Mutrie N, Anderson AS, Treweek S, Wyke S. Can the draw of professional football clubs help promote weight loss in overweight and obese men? A feasibility study of the Football Fans in Training programme delivered through the Scottish Premier League. *Journal of Epidemiology and Community Health* 2011;65(Suppl 2):A37-A38.
135. Haighton C, Moffatt S, Howel D, McColl E, Milne E, Deverill M, et al. The Do-Well study: protocol for a randomised controlled trial, economic and qualitative process evaluations of domiciliary welfare rights advice for socio-economically disadvantaged older people recruited via primary health care. *BMC Public Health* 2012;12(1):382.
136. Stopponi MA, Alexander GL, McClure JB, Carroll NM, Divine GW, Calvi JH, et al. Recruitment to a Randomized Web-Based Nutritional Intervention Trial: Characteristics of Participants Compared to Non-Participants. *Journal of Medical Internet Research* 2009;11(3):e38.

137. Yancey AK, Ortega AN, Kumanyika SK. EFFECTIVE RECRUITMENT AND RETENTION OF MINORITY RESEARCH PARTICIPANTS. *Annual Review of Public Health* 2006;27(1):1-28.
138. Brueton VC, Tierney J, Stenning S, Harding S, Meredith S, Nazareth I, et al. Strategies to improve retention in randomised trials. *The Cochrane Library* 2013.
139. Havard S, Dubuisson C, Volatier JL. Comparison of the description level of food consumption data collected from 24-hour dietary recalls and a 7-day food record. *Annals of Nutrition and Metabolism* 2013;63:1444.
140. Buzzard IM, Faucett CL, Jeffery RW, McBane L, McGovern P, Baxter JS, et al. Monitoring Dietary Change in a Low-Fat Diet Intervention Study: Advantages of Using 24-Hour Dietary Recalls vs Food Records. *Journal of the American Dietetic Association* 1996;96(6):574-79.
141. Frankenfeld CL, Poudrier JK, Waters NM, Gillevet PM, Xu Y. Dietary Intake Measured from a Self-Administered, Online 24-Hour Recall System Compared with 4-Day Diet Records in an Adult US Population. *Journal of the Academy of Nutrition and Dietetics* 2012;112(10):1642-47.
142. Prentice RL, Mossavar-Rahmani Y, Huang Y, Van Horn L, Beresford SAA, Caan B, et al. Evaluation and Comparison of Food Records, Recalls, and Frequencies for Energy and Protein Assessment by Using Recovery Biomarkers. *American Journal of Epidemiology* 2011.
143. NatCen. National Diet and Nutrition Survey: Headline results from Years 1, 2 and 3 (combined) of the Rolling Programme (2008/2009 – 2010/11). In: Beverley Bates, Alison Lennox, Ann Prentice, Chris Bates, Gillian Swan, editors: Department of Health, Food Standards Agency, 2013.
144. Ritchie J, Lewis J. *Qualitative Research Practice. A Guide for Social Scientists*. London: Sage, 2003.
145. Office of National Statistics. Consumer Price Index.
<http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Consumer+Price+Indices#tab-sum-pub>.
 Accessed: 5th May 2015.