

## **Evaluating the effectiveness of a community-based dietary intervention in Nottingham**

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# Evaluating the effectiveness of a community-based dietary intervention in Nottingham

## Abstract

### Purpose

To evaluate the effectiveness of the Eatwell for Life (EWL) programme, with a particular focus on longer-term effectiveness in terms of dietary behaviour and the wider impact. EWL is a 6 week community-based dietary intervention which aims to increase nutritional knowledge, cooking confidence and provide the necessary skills to support behavioural change in relation to eating a balanced diet. There have been many evaluations of community-based dietary interventions, but most focus on brief measures and changes examined at the end of each course.

### Design

A mixed method evaluation was conducted using a self-reported questionnaire, focus groups and semi-structured telephone interviews. Follow up evaluation was conducted at 3, 6 and 12 months with a purposive sample of EWL participants.

### Findings

Sixty-six participants completed both pre and post intervention questionnaires. A total of 22 participants took part in the qualitative follow-up evaluation. The mixed method evaluation demonstrates improvements in participants' fruit and vegetable consumption and a reduction in participants' sugar consumption. Qualitative data highlights key themes such as 'cooking from basic ingredients', 'knowledge of key healthy eating messages', 'changes in eating, cooking and shopping habits' and 'wider influences on family and friends' diets'.

### Originality

This paper is useful to public health nutritionists and other practitioners delivering community-based dietary and cooking skills programmes and those commissioning such provision. It contributes to existing evidence of sustained change over time targeting those in areas of high deprivation.

## Introduction

Dietary intake and eating behaviours in England are related to socioeconomic position. People from lower socioeconomic groups tend to have diets that are less healthy than people from higher socioeconomic groups (Public Health England, 2013). Those living in areas of high deprivation are more likely to lack nutritional knowledge and cooking skills (Caraher, Dixon, Lang and Carr-Hill, 1999 and Darmon and Drewnowski, 2008). A lack of nutritional knowledge and cooking skills is associated with an unhealthy diet including reduced consumption of fruit and vegetables (Dickson-Spillman and Siegrist, 2011) and can influence increasing levels of overweight and obesity (Butland et al., 2007).

A review of the literature on the impact of cooking interventions for adults (Reicks et al, 2014) documents nutrition and cooking skills interventions as an established way to improve dietary intake, cooking skills and health related outcomes. Such interventions seek to increase participant knowledge about diet and nutrition and to develop food-related skills such as cooking, budgeting and shopping (Rees et al., 2012). Community-based nutrition and cooking skills interventions are one of the approaches used by public health nutritionists and public health specialists in strategies to address inequalities relating to food, nutrition and social determinants of health (Garcia, Vargas, Lam, Smith and Parrett, 2013). Something here about funding cuts?

Eatwell for Life (EWL) is one such community-based dietary intervention. EWL targets adults in Nottingham city, particularly those living in areas of high deprivation, at risk of cardiovascular disease, and who have young families. Nottingham city is one of the 20% most deprived areas in England with about 33% of children living in low income families (Public Health England, 2016).

EWL programmes are delivered over 6 weeks in 2 hour sessions and consist of approximately 6-10 participants. They are usually held in community centres, children's centres and primary schools. The intervention has been developed by a team of public health nutritionists, who coordinate the courses across the city and is delivered by a team of community food workers (CFW).

Historically, CFW have been recruited from local communities to access 'hard to reach' groups and identify with the health concerns of local people. In Nottingham, 6 CFW are employed part time by a local social enterprise, Nottingham CityCare Partnership to deliver EWL supported by local authority funding. They are often considered as lay community health workers who do not have professional qualifications and are not working as a health professional (Coufopoulos, Coffey and Dugdill, 2010). They are employed and trained to educate and communicate health and nutrition messages in appropriate and accessible ways in order to help people make informed choices to eat more healthily (Coufopoulos et al., 2010). The CFW have been trained in-house by Registered Nutritionists and Dietitians to deliver basic healthy eating and nutrition messages and to deliver the EWL programme. CFW facilitate and lead on practical cooking activities, nutrition education and utilise behaviour change theories and techniques such as goal setting and group discussions, to help participants make practical changes to their eating habits. EWL is a structured practical cooking and healthy eating programme. Each week comprises of a different healthy eating and nutrition message, along with practical cooking skills in which participants are able to develop on a weekly basis. Topics include the Eatwell guide, how to reduce fat, sugar and salt, food labelling, portion sizes, budgeting and meal planning. The resources used within the sessions are of a visual manner and include kits that contain tubs of sugar, fat and salt which represent the amounts in specific food items. These are used as an activity with the nutrition session and lead to group discussions on how to reduce or swap food choices to reduce the amount of sugar, fat or salt in the diet.

There is an emerging literature base which provides evidence for these kinds of interventions. Existing research investigating impact highlights several areas of change for participants of community-based dietary interventions. Key changes reported include the development of new cooking skills, together with an increase in cooking from basic ingredients and eating fewer convenience foods (Spence and van Teijlingen 2007, Wrieden et al., 2007). A study which investigated whether cooking at home was associated with better diet quality found that those living in households with higher cooking frequency generally followed a healthier diet than those with living in households with low cooking frequency (Wolfson and Bleich, 2014). Specifically, cooking homemade meals is associated with lower consumption of total calories, fat, sugar, fast food and ready meals, which has important implications for obesity prevention (Wolfson and Bleich, 2014).

Dietary change was also reported, particularly in fruit and vegetable consumption, which increased between the baseline and post-intervention stage. Moreover, this was shown to have been maintained at the follow-up stages at 3, 6 and 12 months (Caraher and Lloyd, 2013, Flego et al., 2014 and Garcia et al., 2013). The course participants were also shown to have benefitted from increased nutritional knowledge (Garcia et al.,

2013, Flego et al., 2014) as well as increased confidence in their cooking skills (Garcia et al., 2013, Flego et al., 2014, Wrieden et al., 2007). Further studies (Herbert et al. 2014, Spence and van Teijlingen, 2007) also reported some wider impact on other family members.

In terms of systematic reviews, there is also an emerging literature supporting this particular aspect of public health nutrition work. A systematic review by Rees et al. (2012) identified adult cooking courses that had been previously evaluated in the UK in terms of their effectiveness and appropriateness. They noted that interventions that include cooking may result in improved food choices, dietary behaviours and other health related outcomes. A further systematic review by Iacovou, Pattison, Truby and Palermo (2012) concluded that community-based cooking programmes may be effective interventions in improving participants' cooking skills and nutritional intake. Finally, a more recent systematic review of cooking programmes (Reicks et al., 2014) found that qualitative and quantitative measures suggest a positive influence on dietary intake, knowledge, skills, cooking attitudes and health related outcomes.

Despite these generally positive findings all three reviews of evidence concluded to some extent that the evidence base is limited. Rees et al. (2012) suggested current evidence on the effects of cooking courses is inconclusive due to the lack of high quality evaluations and that more evidence is required about impact. Iacovou et al. (2012) similarly conclude more rigorous research methods, including both quantitative and qualitative studies, are required to effectively measure the true impact of such interventions on nutritional health. Reicks et al. (2014) meanwhile concluded that there was a need for further evidence on the long-term impact of cooking behaviour, dietary intake and health outcomes.

## **Method**

Over the course of the study duration there were 10 programmes delivered with a total of 69 participants. This evaluation used a mixed methods design. Data was collected at different points in time using varied methods such as self-reported questionnaires, semi-structured interviews and focus groups. The quantitative component reflects the most usual evaluation method of community-based dietary intervention as undertaken by practitioners delivering such services (Garcia et al., 2013 and Barton, Wrieden and Anderson, 2011). A self-reported questionnaire was used at pre intervention and post intervention which measured consumption of fruit, vegetables, fat and sugar consumption. The fruit and vegetable questions used in the pre and post questionnaire were posted to all participants at the 6 months follow up stage.

The questionnaire asks participants to report on the number of portions of fruit and vegetables consumed the previous day. The fruit and vegetable consumption questions for this research were updated to bring them in line with the methodologies used to collect data for the Public Health Outcomes Framework in their Active Peoples Survey (Department of Health, 2014). Participants were also asked to record the number of times food and/or drinks high in fat and/or sugar were consumed on a weekly or monthly basis. The aim of this questionnaire is to provide evidence of impact of the intervention on fruit and vegetable consumption as well as fat and sugar consumption.

The magnitude of changes between pre (T1) and post (T2) intervention were compared for fruit and vegetables and fat and sugar consumption using statistical analysis. Further analysis of the follow up fruit and vegetables data was compared post intervention (T2) to follow up (T3) and pre intervention (T1) to follow up (T3). Independent two sample t-tests were used to analyse the statistical significance of the

mean consumption of fruit and vegetables at all three time points. Median fat and sugar consumption was analysed between two time points at pre intervention (T1) and post intervention (T2). The Mann-Whitey U-test was used to assess the significance of changes in fat and sugar consumption between T1 and T2.

The qualitative component of the research supplemented the questionnaire data providing some wider understanding of the impact of the intervention. Purposive sampling was employed utilising maximum variation to ensure a diverse group of participants in terms of socio-demographic characteristics such as age, gender, BME and family structure. Participants were contacted by post, phone and also via partner organisations. Three focus groups were conducted and an additional 3 semi-structured telephone interviews aimed at those participants who were unable to attend a group, were conducted at this 3 months follow-up stage. Telephone interviews were conducted at 6 and 12 months follow up. Participants were selected on availability and willingness to undertake a telephone interview.

Interviews and focus groups were transcribed and thematically analysed. Thematic analysis provides a means of exploring patterns within the qualitative data and as a flexible method can be used alongside standard quantitative measures as a supplement to the questionnaire data. This provides some richer understanding of how the participant's frame of reference gives more depth to understanding their experience of the intervention. The themes emerging from the analysis include participants cooking more using basic ingredients, improvements in knowledge of healthy eating, dietary and behaviour changes as well as some small indications of wider impact on other family members.

### **Ethical considerations**

As an evaluation of a community-based dietary intervention, the proposal did not require formal ethical approval from an NHS Research Ethics Committee. The primary research in this paper was undertaken as part of postgraduate course at Sheffield Hallam University and the research proposal was been considered and approved via the university ethical procedures. Informed consent to take part in the study was sought from past participants of the EWL programme. Participants were invited to take part in the evaluation and were free to withdraw without reason at any time from the evaluation process. Collection and storage of data throughout the evaluation process followed information governance standards and was anonymised to ensure confidentiality throughout the study.

## **Results**

### **Quantitative Data**

All 69 participants completed a pre-intervention questionnaire during the 2 month research period. Subsequently, 66 of those participants completed the post-intervention questionnaire. In line with other evaluations of community-based dietary interventions, the EWL programme demonstrated a positive impact over the length of the course in terms of improvements from the pre to post intervention stage. Analysis showed statistically significant increases between pre and post intervention in average daily fruit consumption (0.85 portions,  $P < 0.001$ ) and vegetable intake (0.99 portions,  $P < 0.001$ ) (Table 1).

**Table 1 - Mean (standard deviation) fruit and vegetable consumption at baseline (n=66) and post intervention (n=66) and change between baseline and post intervention (paired t-test)**

Question	Baseline (T1)	Post	Mean	P-value
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	mean (SD)	intervention (T2) mean (SD)	difference (T2-T1)	
How many portions of <b>fruit</b> did you eat yesterday?	2.12 (1.62)	2.97 (1.57)	0.85	<0.001
How many portions of <b>vegetables</b> did you eat yesterday?	2.06 (1.57)	3.05 (1.50)	0.99	<0.001

Analysis showed a significant reduction ( $P < 0.001$ ) in median values of sugar consumption between pre and post intervention, from 'once a day' to 'once a week or less' respectively (Table 2). However, median values of fat consumption remained the same post intervention as at baseline with participants reporting eating foods high in fat 'at least once a week' ( $P = 0.002$ ).

**Table 2 - Median values for fat and sugar consumption**

Outcome measure	Baseline (T1) median	Post intervention (T2) median	P-value
<b>How often do you eat the following foods? *</b> Pies, pasties, chips, sausage rolls, fried dumplings, samosas, takeaways (For example, Chinese takeaway, Indian takeaway, fried chicken, kebabs, fish and chips, burgers, pizza) or similar high fat or fried foods	4 (n=65)	4 (n=66)	0.002
<b>How often do you eat and drink sugary food? **</b> For example, cakes, biscuits, sweets, chocolate, mithai, Nutriment, cans of cola or fizzy drinks, energy drinks (not diet drinks)	3 (n=65)	5 (n=65)	<0.001

\*Scale values are from 1 to 6: 1 = 'everyday'; 2 = '4-6 times a week'; 3 = '2-3 times a week'; 4 = 'at least once a week'; 5 = 'at least once a month'; 6 = 'never or hardly ever'.

\*\*Scale values are from 1 to 6: 1 = 'more than twice a day'; 2 = 'twice a day'; 3 = 'once a day'; 4 = '3-6 times a week'; 5 = 'once a week or less'; 6 = 'never'.

63 people were sent the follow up postal questionnaire questionnaires (3 had changed address and were not contactable) at 6 months. 22 were returned completed. Analysis of follow-up questionnaires at the 6 months stage showed some changes were maintained over time. Paired means were analysed and showed continued increases in vegetable consumption with a significant increase of 1.36 portions ( $P < 0.001$ ) between pre-intervention and follow-up (Table 3). The follow-up questionnaire provided good evidence of maintained changes in terms of increased vegetable consumption. This, however, was not matched by a continued increase in fruit consumption.

**Table 3 - Paired means of fruit and vegetable consumption at baseline, post-intervention and at 6 months follow up (n=22)**

Question	Baseline (T1) mean (SD)	Post intervention (T2) mean (SD)	6 months follow-up (T3) mean	Changes between follow up and baseline (T3-T1) mean	P value	Changes between follow up and post intervention (T3-T2) mean	P value

			(SD)				
How many portions of <b>fruit</b> did you eat yesterday?	1.91 (1.41)	3.04 (1.40)	2.77 (1.54)	0.86	0.02	-0.27	0.35
How many portions of <b>vegetables</b> did you eat yesterday?	1.77 (1.72)	2.91 (1.51)	3.13 (1.39)	1.36	<0.001	0.23	0.53

## Qualitative Data

In total 22 participants took part in the qualitative component of the research. The 3 month qualitative component of the evaluation included 14 participants and 8 participants took part in the telephone interviews at 6 months. Out of the 22 participants, 12 took part in the telephone interviews at 12 months.

One of the key themes indicated that participants were now cooking from basic ingredients and reducing the amount of convenience foods consumed. The qualitative data at 3 months provided some evidence of an increased confidence in cooking and preparing healthy food and an increased confidence to cook more meals from basic ingredients. As the following quotes illustrate.

*I tried the recipes and did them at home (Focus group 1, participant 1).*

*Before I had more ready meals and felt lazy. Now I eat things like chickpeas and lentils – add them to stews (Telephone interview participant 2, 3 months).*

These participants identified changes at 6 months that attending the course had increased the fresh foods that they were now cooking at home including new ingredients and that they were now using fewer convenience or pre-prepared foods (ready meals).

*Always cook from scratch now – even pizza (Telephone interview participant 6, 6 months).*

*Yes [cooking from scratch more], no ready meals. Making beans on toast myself – never done that before (Telephone interview participant 2, 6 months).*

*Very seldom buy ready meals now. I've reduced the amount of bought meals I have. Made vegetable soup yesterday (Telephone interview participant 4, 6 months).*

*Before I had more ready meals now I make my own sauces (Telephone interview participant 3, 6 months).*

The following quotes illustrate the sustained changes at the 12 months follow-up stage with regards to cooking from basic ingredients.

*Everything is from fresh. Very rare I eat 'junk', which was a regular before (Telephone interview participant 7, 12 months).*

*Making sauces from scratch. I bought a food processor to make meals from scratch. Only had 2 pork pies all year – these used to be my downfall (Telephone interview participant 9, 12 months).*

*More confident cooking from scratch and I'm eating more vegetables. Really enjoyed the course - changed the way I cook for the long term. (Telephone interview participant 10, 12 months).*

Qualitative data provides some evidence of improvements in knowledge of key healthy eating messages. The following quotes illustrate that after 3 months the participants were still looking at food differently in terms of increased awareness of what is in the food and reading food labels. This reflects the key healthy eating messages taught and the activities delivered on the course. The last three quotes illustrate that these messages were still effective for some participants 6 and 12 months after the course.

*You look at your food differently now than what you did before. You wouldn't think about. I'm a big lad I do like my food. I'd eat owt. I think to myself now, I'm not gonna eat that, that's got tonnes of salt in. It's got this, it's got that in (Focus group 1, participant 3).*

*I've never looked at salt so much but now I do look at salt...and fat (Focus group 1, participant 1).*

*The sugar and salt kits were great as it was the shock factor and think wow especially the things like milkshake and Lucozade and you always think I'm ill lets have some Lucozade but actually it's full of sugar which makes you feel better and gives you energy for 5 minutes but then you feel rubbish again (Focus group 3, participant 3).*

*The fat tubs – they stuck in my mind. You think oh my god! Didn't realise so much fat in that! (Telephone interview participant 8, 6 months).*

*I'm more aware of salt intake...more understanding about food labelling (Telephone interview participant 11, 12 months).*

*I have more knowledge about hidden salts and sugars from the course (Telephone interview participant 12, 12 months).*

It is clear from the quotes that the participants gained nutritional knowledge as a result of attending the course. There was an increased awareness of the nutrition content of food, in particular sugar, fat and salt. This resonates very much with the research in Australia in which participants' knowledge of specific healthy eating topics increased as a result of attending a cooking skills programme (Flego et al., 2014). The use of interactive and visual resources clearly had an impact on participants, which is particularly important especially for those with lower literacy levels and for those that adapt better to visual teaching styles.

In addition to increased awareness of healthy eating messages participants also reported making dietary changes. Several sub-themes arose from the research when participants were asked about any changes they had made since attending the course. Changes in eating habits, shopping habits, cooking methods and trying out new foods were identified as a result of attending the course. The following quotes all relate to



changes in eating habits maintained at 3, 6 and 12 months. The impact of knowledge on behaviour is clearly expressed in the quotes in terms of messages received from the course.

*I have less salt, I like my salt on most things but now I've cut my salt down. (Focus group 3, participant 1).*

*I've cut down my sugar in my coffee. I used to have 2 sugars now I have one.....I've cut down my energy drinks as well. Was having like 3, now have gone down to 1 (Focus group 3, participant 2).*

*Crisps were a big issue – have now swapped for healthier snacks (Telephone interview participant 1, 3 months).*

*I'm actually shoving food away now. I say I shove it away now and say I don't want it. That's something I didn't do before (Focus group 1, participant 2).*

*I'm eating more sensibly now – wasn't eating enough fruit and veg but now make sure I have a fruit snack in my packed lunch at work (Telephone interview participant 8, 6 months).*

*I don't have as much red meat and not as many pies (Telephone participant 8, 12 months).*

*Choosing healthier options when shopping and more fruit and vegetables. Buying smaller loaves of bread and avoiding pastries. When I'm out and about I pick healthier options like salads without dressings (Telephone interview participant 9, 12 months)*

The participants identified further dietary changes in terms of different ways of cooking and menu planning 3 months on from the course, with the last quote reflecting continued changes to cooking practices 12 months beyond the course.

*I steam my vegetables and don't cook fatty things (Focus group 2, participant 1).*

*I used to fry using oil don't use it at all. I used to make homemade deep fried chips now make oven baked chips using fry light (Telephone interview participant 1, 3 months)*

*Before I used a lot of palm oil in my cooking now I have cut it down and my weight has reduced (Telephone interview participant 3, 3 months).*

*I'm putting a menu together now and planning meals (Telephone interview participant 1, 3 months).*

*I now have a slow cooker instead of getting convenience foods and have not as much salt added to food, now using spices instead (Telephone interview participant 1, 12 months).*

In terms of the wider impact 3, 6 and 12 months on from the course, participants identified attending the course as the key determinant in dietary change of themselves and their family members. The following quotes illustrate the kinds of changes made by family members which again reflect the key nutrition messages on the course.

*I've been trying to get him [son] to eat more vegetables....I actually don't buy as many sugar free drinks for my little boy as I used to buy a lot.....the best thing to be giving your child is water, waters the best (Focus group 2, participant 3).*

*Wife is eating more fruit and vegetables now (Telephone interview participant 1, 6 months).*

*Husband now eats more healthy food, he's lost weight too and trying new foods (Telephone interview participant 3, 6 months).*

*The course was really helpful for my son as I'm now teaching him about healthy options (Telephone interview participant 2, 12 months).*

*Me and the kids are eating more healthier and more balanced diet (Telephone interview participant 10, 12 months).*

Three, six and twelve months on from the Eatwell for Life course, the telephone interviews and focus groups highlight a well-received service. Participants described their enjoyment of attending the programme, making new friends and sharing their learning with others, which at the same time highlights the wider impact of the programme. The research resonates with existing research, in which feelings of accomplishment and encouragement were widely reported, with many participants sharing their acquired knowledge with others (Herbert et al., 2014). Cooking skills programmes can improve social interactions in terms of participants making new friends, breaking social isolation and having access to social and emotional support (Iacovou et al., 2012).

## **Discussion**

The evaluation of the Eatwell for Life programme provides evidence of both the immediate improvements in healthy eating, immediately on completion of the course and at the 3, 6 and 12 month follow up stages. Data also points to evidence of positive and sustained changes in participants' cooking and eating behaviours. This evaluation contributes to the fairly limited literature on the longer term impact of these types of community dietary interventions.

The quantitative questionnaire provides statistically significant evidence of sustained and continued improvements in vegetable consumption. A bigger increase in vegetable consumption compared to fruit consumption at follow up could be a reflection of the course content due to the significant emphasis placed on increased vegetable consumption with meals and cooking using basic ingredients. Further research to explore this should be considered. A small increase of 1.36 portions of vegetables between baseline and at follow up is likely to have positive benefits for participants. This is in light of recent research indicating that eating vegetables had the strongest protective benefit compared to fruit, with each daily portion reducing the overall risk of heart disease and cancer by 16% (Oyebode et al. 2014).

The qualitative data provides a richer understanding of the quantitative findings from the participants' perspectives with evidence of sustained improvements in knowledge, cooking using basic ingredients, newly acquired cooking techniques along with some evidence of the impact on other family members. The 6 and 12 months follow up interviews provide evidence of knowledge and change sustained over time and showed positive findings. What was reflected strongly in the qualitative data was a sense of participants being able to cook using basic ingredients as a result of attending EWL.

This was reflected in participants cooking meals from basic ingredients beyond the programme at 3, 6 and 12 months.

The effectiveness of the EWL programme could be down to several factors. Firstly, EWL uses a community development approach to promote health and wellbeing and the programmes are facilitated by CFW whose local knowledge and networking jointly support where delivery takes place. The courses take place at a grass roots level in local communities and enables people to come together to share experience, knowledge and skills.

Another strength is down to the mode of delivery which supports people to develop new skills and make changes to their lifestyle. Behaviour change theory and techniques are embedded into the programme from the beginning and participants set SMART goals at the beginning of the programme and work towards them throughout the six weeks. Many cooking skills interventions do not focus or include behaviour change as a key element and therefore this is a major strength of EWL.

A further strength to EWL is the promotion of evidence based healthy eating messages and the nutrition expertise in the team, which underpins the whole programme. EWL combines practical cooking skills as well as nutrition education and the inclusion of both has been shown to be effective in terms of improving cooking self-efficacy and encouraging healthy eating habits (Wolfson and Bleich, 2014).

#### Limitations

Despite the strengths of the programme, there are a number of methodological limitations to consider. Firstly, the need for a simple and easy to use robust questionnaire on dietary behaviour suitable to implement for the target audience in terms of literacy and numeracy skills. Tools such as the FACET questionnaire are too long and complex and not practical to implement at a project level due to literacy skills levels of participants and the time constraints within the sessions (Davies, 2010). The questionnaire used was sufficient for the service needs, easy to administer, suitable for pre and post intervention and easy to check for completion. There is a need for extra support around development of resources to evaluate dietary interventions effectively as often these types of interventions are not evaluated because of the lack appropriate tools available. The qualitative data may also reflect a social desirability bias.

A further limitation of the research was that there no control group to compare the findings of the intervention group. This is due to the programme delivery, in public health nutrition practice in areas of high social deprivation it is not often possible to engage people in a control group or keep people on waiting list to act as a control. The realities of the programme delivery and the evaluation meant that this would have been difficult to implement, particularly due to the nature of the target population. This raises the important issue of the extent to which claims can be made about the changes being due to the intervention and no other confounding factors outside of the intervention.

There are several difficulties with long-term follow up some of which were experienced with the study. Some of the participants had moved address since attending the course which meant they could no longer be contacted. Accessing participants proved difficult. 32% of the original sample of participants took part in various elements of the qualitative research at 3, 6 and 12 months. The practical difficulties of research on public health nutrition interventions in deprived communities are often associated with considerable subject burden and could have contributed to the low retention rates. These difficulties have been echoed in existing research of similar interventions (Wrieden et al., 2007). Although it is recommended in the Standard Evaluation

Framework for dietary interventions, written by the National Obesity Observatory (Roberts, Cavill and Rutter, 2012), to collect data at a minimum of 3 follow-up points it is not always practicable at project level due to time and budget constraints of services. In this study there were 3 follow up points but this was not without both time and practical considerations. Few public health nutritionists, including the main author, are funded for research or in depth evaluation of interventions and with many other competing demands on their role, capacity is limited to carry out research evaluation. This research was not a commissioned study but as part of service evaluation. This highlights the importance of commissioning evaluation into existing services and building capacity within practitioner roles in order for evaluation of public health interventions to take place. Despite these limitations both the quantitative and qualitative data demonstrate some positive changes sustained over time.

### **Conclusion**

Overall the findings suggest EWL has a positive role in influencing change in dietary habits and behaviour and maintaining these post intervention. Although some of the changes have been small they have nonetheless made significant and wider impact, this potentially provides evidence for the usefulness of these interventions in any public health strategy to promote and improve nutritional knowledge, cooking skills and therefore dietary behaviour. Community-based dietary and cooking skills interventions can provide one approach to improve dietary behaviours over the longer term and contribute to public health approaches to obesity prevention and reducing health inequalities.

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