An evaluation of the Leicestershire community kitchen scheme.

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Plain Language summary

Background: In 2017 Leicestershire County Council (LCC) set up three Community Kitchens (CKs). The aim was to reduce household food waste (HHFW). An evaluation of these kitchens by LCC found them to reduce HHFW. The evaluation also suggested participation might be associated with health and wellbeing benefits, but did not explore these in detail.

Aims: To understand the health and wellbeing benefits experienced from participating in the CKs and how these may be achieved.

Methods: The study used questionnaires, observations and interviews with CK participants, volunteers and council staff who facilitated the sessions.

Key findings: The CKs were valued and considered worthwhile by participants, volunteers, and staff. The most important benefit was reported to be increased social interaction. This was particularly important for people at risk of, or experiencing isolation

Patient and Public Involvement (PPI): Three ex-CK attendees and volunteers and three local residents with no experience of CKs helped to inform how the study was designed and carried out. Two of the six PPI representatives also engaged in regular study management meetings throughout the duration of the research, including the interpretation and dissemination of results, to ensure a lay persons perspective, inclusivity and accessibility of research findings.

Conclusions: The reduction of HHFW is no longer the focus of the CKs in this study. However, the CKs provided a useful and beneficial space for individuals to socialise, learn new skills and experience the health and wellbeing benefits of social interaction. Community kitchens are not necessarily effective for reducing HHFW but they do improve social health. A refocus on the social benefits of CKs and the provision of CKs in accessible generic facilities is likely to attract more participants and volunteers.

Key words: Community kitchens, health and wellbeing, household food waste, Leicestershire, process evaluation, social interaction, social isolation.

Background

Cooking interventions have been used to improve eating behaviours, nutritional status, weight related outcomes, and cooking skills.[1-3] Systematic reviews have repeatedly demonstrated cooking interventions to lead to favourable outcomes[3] amongst the general population and in specific patient populations (e.g. patients with eating disorders).[4]

Community kitchens (CKs) are community-based cooking programmes in which small groups of people meet regularly to plan, cook and share healthy, affordable meals. CKs are designed for anyone to participate in and can be run anywhere with a kitchen (e.g. churches, schools, community buildings). The main differences between CKs and other food assistance programmes (e.g. soup kitchens) are their collaborative, participatory nature, and their potential to foster cooking, nutritional and social skills and support.[5]

Most of the research literature on CKs (sometimes referred to as collective kitchens) comes from studies conducted in Canada, Australia, and Scotland.[6] The primary aim of these studies has been to examine the impact of CKs on health promotion. The results suggest that CKs are an effective public health strategy for improving nutrition.[7-10] For example, participants repeatedly report an improvement in their intake of nutritious food,[11-14] a greater diversity of food[13] and a reduction in fast food consumption.[15] Fano et al. also suggest that the dietary impacts from participating in CKs have flow-on effects to other family members, because CK participants feed their families healthier food.[16]

While previous research on CKs does not focus directly on the social impacts and experiences of participation, feeling socially supported and less isolated consistently emerge as results.[7,14,16-19,20] Racine and St-Onge found that some of the most frequent outcomes reported by participants of a CK were decreased isolation, friendship development, mutual aid, moral support, increased self-confidence, self-esteem and increased participation in other community events/organisations. [19] All these outcomes were found to relate to increased feelings of being socially supported.[19] Moreover, Fano et al[16] found that social interactions and support were the main reasons participants gave for why they joined a CK. Other benefits of participating in CKs have included the development of skills and access to employment.[8,16,19]

An increased awareness of the environmental impact of food waste led Leicestershire County Council (LCC) to establish three CKs in 2017. These were established with funding from a national supermarket as part of their Waste Less Save More project. LCC applied six resources used by the climate action NGO Waste and Resources Action Programme (WRAP)[21] which aims to reduce the climate impact of food and drink: 1) meal planning; 2) understanding labelling on food; 3) using shopping lists; 4) storing and using leftovers; 5) portioning properly; and 6) food storage advice. The aim of the CKs was to engage individuals from all walks of life with household food waste (HHFW) issues and build community capacity to reduce HHFW effectively and sustainably. The CKs were, and continue to be funded by LCC and participant donations. They are held in community houses (i.e., community centres) and churches with suitable facilities, and co-ordinated by volunteers and/or Borough Council staff.

An unpublished internal report evaluating the three original CKs found them to be effective in reducing HHFW. LCC reported that over the course of a six-to-eight-week period, participants reduced their HHFW by 33% on average. CK participants also reported a range of health and wellbeing benefits including increased social interaction, reduced loneliness, increased self-confidence and employability. However, because the primary focus of the LCC report was on HHFW, the health and wellbeing benefits from participating remained unclear. There are now six established CKs in Leicestershire, and while the original three CKs were held on a weekly basis, today the kitchens are held fortnightly, alternating with a craft session. These craft sessions have been set up by LCC Borough Council Staff, to offer an alternative community activity for CK participants to attend when the CKs are not running. The craft sessions are open to individuals irrespective of whether they participate in the CKs. This schedule amendment occurred because the volunteers who facilitated the CKs found the organisation of CKs on a weekly basis to be challenging in terms of time and responsibility (e.g. shopping, planning). More than 50% of the participants who attend the CKs sessions also attend the craft sessions, meaning for the purpose of this study they are being treated as part of the same intervention.

This paper reports the results of a process evaluation of the CK and craft session scheme. The evaluation focused on the following research questions:

1. What population groups are CKs and craft sessions reaching?

2. What health and wellbeing benefits do participants attribute to the CK initiative and are these different from those attributed to the craft sessions?
3. How are the health and wellbeing benefits achieved?
4. How does context affect the health and wellbeing benefits?

Methods

We conducted a mixed methods process evaluation collecting data through 1) questionnaires with CK and craft participants; 2) observations of CKs and craft sessions and; 3) interviews with CK and craft participants, volunteers and borough council staff. Questionnaire data aimed to quantitively identify who was attending the CK and craft sessions, while qualitative data gathered from observations and interviews aimed to allow a more in-depth exploration of experiences and perceived health and wellbeing benefits. Observations also enabled researchers to directly observe the contextual influences of the CK and craft sessions in addition to participant interactions with each other, the volunteers, and Borough Council staff.

Prior to all data collection methods, participants were sent a participant information sheet detailing the aims of the study, information about confidentiality, anonymity and the use of data collected. Signed or verbally obtained informed consent was provided by all participants prior to data collection. Ethical approval for the study was awarded by the University of Bristol's Faculty of Health Sciences Research Ethics committee in March 2022 (ref. 10175).

Participant Involvement and Engagement

LCC were involved in the development of the study logic model, protocol and design of the data collection tools. The study team also undertook a two-hour online public involvement workshop with previous CK participants (n=2) and volunteers (n=1) and three local residents with no previous experience of community kitchens. During the workshop, they were consulted about the participation information sheet (PIS), data collection methods, materials (e.g. interview topic guide) and the recruitment methods. The workshop took place before recruitment began to ensure study materials and methods were relevant, inclusive, and accessible. Two individuals who took part in the

workshop were also recruited to attend regular study management group meetings throughout the course of the study.

Data collection 1: Questionnaires

A paper questionnaire was distributed to all willing CK and craft participants at the beginning of each session throughout the duration of the study. It was distributed by the volunteers, Borough Council staff or by the first author (CH) during one of the planned observations. The questionnaire was the same for CK and craft participants, but wording was changed to be appropriate for each group.

Quantitative data were gathered on participant demographics (i.e. gender, age, highest level of education achieved, employment status, income, current housing situation), food expenditure/security, general and mental health, social interactions, and satisfaction with social support. Food expenditure/security was measured using nine items which asked participants about their ability to afford and access food (e.g. "I feel I can easily buy healthy food in my neighbourhood") on a five-point Likert scale (1=*strongly disagree*, 5= *strongly agree*). General health was measured by asking participants to indicate the status of their general health (i.e. very good, good, fair, bad, very bad, don't wish to say). Mental health was measured using the validated Mental Health Inventory (MHI-5).[22] The inventory comprised five questions about mood over the past month and measured psychological well-being and the absence of psychological distress. Each item was rated on a six-point Likert scale (1=*all the time* – 6=*none of the time*). Social interaction and satisfaction with social support was measured using a subscale of the validated Duke Social Support Index (DSSI-10).[23,24] Four items measured the number of social interactions (e.g. how many times during the past week did you spend time with someone who does not live with you?) and six items measured satisfaction with social support (e.g. when you are talking with your friends and family, do you feel you are being listened to?). Each item was rated on a three-point Likert scale (1=*hardly ever*, 3=*most of the time*).

Open questions also gathered data on participants' perceptions of the aims of the CK or craft session, the perceived health and wellbeing benefits, advantages, and disadvantages of attending.

Data collection 2: Group observation

Four of the six established CK were observed during May-July 2022. The four kitchens were selected based on participant characteristics (e.g. gender) and location (rural or urban). Three of the selected kitchens were gender specific (one for men only, two for women only). The other kitchen was mixed gender. All except one of the CKs were in urban areas. Two craft sessions were also observed, one that was attended by participants who also attended the CKs and one that was attended by participants who only attended the craft sessions. Observing sessions that included participants who did and did not attend the CKs allowed for the research to explore contextual influences on health and wellbeing benefits in addition to exploring potential reasons for why individuals choose not to attend the CKs. The researcher observed the adherence to the core elements of the sessions (i.e. activities and WRAP resources), how the sessions worked, what was happening and why, what were regular and irregular activities, participant interactions with each other and the volunteers and what impact they may be having on the health and wellbeing of participants. Research was aided by an observation framework that enabled detailed field notes to be recorded.

Data collection 3: Interviews

Semi-structured interviews were undertaken with participants (15), volunteers (3), and Borough Council Staff (2). All interviews were held online, by phone or face-to-face depending on preferences, availability, and access to facilities and resources. The interviews were guided by a topic guide. Questions explored experiences, perceived health and wellbeing benefits from participating in the CK and/or craft sessions, reasons for attending or not attending the different sessions and what could be done to increase attendance and expand the scheme across Leicestershire. Interviews lasted between 14 and 66 minutes (mean=34 minutes). The topic guide was the same for CK and craft participants, but wording was changed to be appropriate for each group. Individuals who participated in the interviews were reimbursed £15 for their time.

Data analysis

Quantitative data were analysed descriptively using STATA. Data were descriptive in nature because the sample was too small to examine relationships between the variables or any significant differences between the participants of the CKs and craft session. Results for sociodemographic data

are presented in percentages. Results for computed variables (i.e. food security, mental health, social interaction, and satisfaction with social support) are presented as mean scores (see Table 1). The reliability of items used for each computed scale was measured using Cronbach's alpha. Cronbach alpha is a measure of how closely related a set of items are as a group. Scores of 0.6-0.7 indicate an acceptable level of scale reliability and 0.8 or greater indicate a very good level of reliability.

Food expenditure and security scores were computed by summing the responses to the nine items (range 1-5) and then dividing the sum score by the total number of items (i.e. 9). Scores ranged from 1-5 where higher scores indicated greater food security (Cronbach alpha, α=0.93). Mental health scores were computed by summing the responses to the five items (range 0-30). Higher scores indicated better mental health (Cronbach alpha, α=0.81). Social interaction scores were computed by summing responses to four items (range 4-12). Higher scores indicated good social interaction (Cronbach Alpha, α=0.42). Satisfaction with social support was computed by summing six items (range 6-18). Higher scores indicated higher satisfaction with social support (Cronbach alpha, α=1.0).

For the observations, the researcher (CH) reviewed the field notes from the observation frameworks assigning codes based on the research questions. A narrative synthesis for the CK and craft sessions exploring similarities and differences is provided in the Results below.

Each of the interviews was transcribed verbatim, imported into NVivo software, and analysed using thematic analysis.[28] Researchers (CH and TJ) met during data analysis to cross check the codes and themes generated against extracts of the data. Any disagreement between researchers was resolved through discussion. Qualitative data are presented as a summary accompanied by illustrative verbatim quotations. Within illustrative quotations the use of […] indicates part of the quotation was not presented because it was not relevant, whereas (text) indicates additional text was added for clarity (i.e. readability, comprehensibility). Grammatical errors were corrected and idioms (e.g. 'like, 'you know,' 'kind of') removed to also improve readability and comprehension. Verbatim quotations were labelled according to whether they were from a volunteer or staff (S/V) or participant (P) and are accompanied by a participant number.

Results

Questionnaire

A total of 45 individuals attending the six CKs in Leicestershire were asked to complete the survey with 33 doing so (73.3% response rate). Of these, a total of 26 (78.8%) were women and 7 (21.2%) were men. Of the six individuals who only attend the craft sessions, four completed the questionnaire (66.7% response rate), all of whom were women. As shown in Table 1, the largest proportion of CK and craft participants were retired (39.4%, 100% respectively), had at least a high school or college level of education (81.8%, 75% respectively), had no known disability (51.5%, 100% respectively), owned their own home (54.6%, 100% respectively), had fair to very good general (72.7%, 100% respectively) and mental health (*M*=21.9, *M*=24, respectively), food security (*M*=3.9, *M*=4.8 respectively), social interaction (*M*=9.1, *M*=8.8 respectively), and were satisfied with the amount of social support (M=15.2, M=17.3, respectively).

Table 1.

Sociodemographic, food security, health, and socialisation characteristics[1]

	Community kitchen (N=33)	Craft (N=4)
Age		
25-34	2 (6.1)	0 (0.0)
35-44	0 (0.0)	0 (0.0)
45-54	5 (15.2)	0 (0.0)
55-64	5 (15.2)	0 (0.0)
65-74	10 (30.3)	4 (100)
75-84	9 (27.3)	0 (0.0)
85+	1 (3.0)	0 (0.0)
Missing	1 (3.0)	0 (0.0)
Employment		
Employed	2 (6.1)	0 (00)
Unemployed	1 (3.0)	0 (0.0)
Retired	13 (39.4)	4 (100)
Unable to work (physical)	3 (9.1)	0 (0.0)
Unable to work (mental)	2 (6.1)	0 (0.0)
Home maker	2 (6.1)	0 (0.0)
Other[2]	7 (21.2)	0 (0.0)
Missing	3 (9.1)	0 (0.0)
Disability		
No	17 (51.5)	4 (100)
Yes	9 (27.3)	0 (0.0)
Prefer not to say	4 (12.1)	0 (0.0)
Missing	3 (9.1)	0 (0.0)

	Community kitchen (N=33)	Craft (N=4)
Highest level of education		
High school	16 (48.5)	1 (25.0)
College	11 (33.3)	2 (50.0)
Postgraduate	1 (3.0)	1 (25.0)
Other	3 (9.1)	0 (0.0)
Missing	2 (6.1)	0 (0.0)
Housing situation		
Homeowner	18 (54.6)	4 (100)
Rent (private landlord)	1 (3.0)	0 (0.0)
Rent (social housing)	8 (24.2)	0 (0.0)
Live with parents	4 (12.1)	0 (0.0)
House/flat share	0 (0.0)	0 (0.0)
Other	0 (0.0)	0 (0.0)
Missing	2 (6.1)	0 (0.0)
Income		
£0-£14,999	10 (30.3)	0 (0.0)
£15,000-24,999	2 (6.1)	0 (0.0)
£25,000-£34,999	0 (0.0)	0 (0.0)
£35,000+	0 (0.0)	0 (0.0)
Missing	21 (63.6)	4 (100)
Health status		
Very good	3 (9.1)	1 (25.0)
good	11 (33.3)	1 (25.0)
fair	10 (30.3)	2 (50.0)
Bad	5 (15.2)	0 (0.0)
Do not wish to say	4 (12.1)	0 (0.0)
Food security (M; range 1-5)	3.9	4.8
Mental health (M; range 0-30)	21.9	24.0
Social interaction (M; range 4-12)	9.1	8.8
Satisfaction with social support (M; range 6-18)	15.2	17.3

Note: *M*=Mean, percentages vary due to missing data, [2]includes a combination of being unemployed and unable to work for physical and mental needs (6.1%), being unable to work due to physical and mental needs (9.1%) being unemployed and a homeowner (3.0%), being employed and a homeowner (3.0%)

Observations

Observations showed the CKs to offer a supportive and inclusive environment. Participants, volunteers and staff supported each other to collaboratively participate in the cooking activity. Participants attending the CKs therefore had varying levels of ability cognitive and physical needs. Craft sessions were less inclusive due to the intricacy of the crafts practiced. Further, while participation in the CKs involved active collaboration with others, participation in the craft activity was largely on an individual level, independent of assistance from others. Volunteers and Borough

Council staff attended the CK and craft sessions. However, for the CKs they acted as facilitators, whilst during the craft session they engaged as participants.

The cooking activity took precedence during each of the community cooking sessions observed. All participants arrived expecting to engage in cooking. The theme of reducing HHFW was not mentioned during the observation of two CKs. While the CKs made use of some of the resources associated with WRAP (e.g. measuring cups, recipe books), reducing HHFW was not discussed in detail, or observed to constitute a core element of the session.

Participants and volunteers/staff socialised easily during the CK and craft sessions. Interactions were relaxed and centred around the activity at hand. The majority of in-depth or more serious discussions (e.g. health/personal issues) during the CKs occurred during the breaks (e.g. when the food was cooking in the oven). However, these types of conversations were rare. They were more likely to occur during the craft sessions because the craft session tended to have fewer interruptions because engagement in the activity was at the individual rather than the group level. Notwithstanding this, conversations during both CK and craft sessions, were mostly light-hearted. In all the groups observed some individuals were more dominant than others with some participants being more likely to shy away from conversations, preferring to observe social interactions rather than participate.

Interviews

A total of 20 interviews were conducted with individual CK (n=14) and craft (n=1) participants, volunteers (n=3) and LCC Borough Council staff (n=2). Thematic analysis produced five themes:

1. ***Finding out about the session and ease of attending***

Attendance was initiated by the participants themselves or professionals involved in their care. Participants found out about the CKs through participation in another community-based activity, word of mouth, via signposting and referrals from the Local Area Co-ordinator or by being taken to the CKs by their carer. There was a general agreement among all participants that the CKs were poorly advertised. Advertisement of the CKs was, and continues to be, limited to the Facebook pages associated with the community houses and the churches in which they take place, or the local

community newspaper. Adverts were consequently reported to be more accessible to particular groups of individuals:

> *"It says council run. But it's under the church. It's not. It's not necessarily, making itself (the CK) known to people that aren't necessarily linked with the church" P10.*

In addition to the reach of the adverts, the lack of information included (e.g. dates, times, and locations) was also suggested to prohibit awareness and involvement in the CKs. As a result, participants reported that prior to their active engagement in the sessions, they had a lack of understanding about the CKs, including who they were intended for (specific groups or the general public) and what the sessions involved (e.g. cooking lessons, free food).

There was also ambivalence among the participants in terms of session location and ease of attendance with some participants reporting the location to be a barrier to participation. For example, the community houses were originally established to bring services into deprived areas. Consequently, the location was associated with deprivation and anti-social behaviour, both of which were perceived by some to be barriers to participation, particularly for new individuals considering attending:

> *"Those flats that the Community house is in. If you ask 90% of […] people, what happens in them flats, they'll say it's full of criminals" S/V19.*

Session location was also reported to have a negative impact on ease of participation. For example, less physically able participants, and participants who were unable to drive, reported difficulties with accessing the location due to lack of direct public transport:

> *"The bus is only every hour and a half, it's difficult to get out of the village" P2.*

> *"You know I can only get the bus to a certain place then I've got to get either another taxi or walk up, which for me just takes ages and I'll be exhausted by the time I got there" P11.*

2. Experiences of attending

Overall, participants provided positive feedback about the CK and craft sessions. Staff, volunteers, and participants perceived the CKs to be a good idea, to have value and enjoyed being involved or attending:

"I think it's (the CK) a good idea" P12.

"I think it's (the CK) really good. I think it's a really good idea. I love it" P3.

"I just enjoy it (the CK) so much" P2.

Reasons for attending the sessions included them being a source of social interaction and company, offering structure and routine for participants who lived alone and offering an opportunity for participants to have time to themselves, learn new skills and have a break from other responsibilities (e.g. caring). Staff, volunteers, and participants all reported that they enjoyed the sessions, with some reporting them to be the highlight of their week. Notwithstanding this, most participants reported that the activity itself (i.e. cooking, craft) was not central to their enjoyment. The opportunity to socialise was reported to be the primary reason for attendance, while the activity was reported to be an added bonus:

"So, it's not about the actual cooking of the thing, I think it's probably as well to sit and eat a meal with somebody" S/V19.

"I think sometimes the socialising has become more important" P7.

"It's important for me then that I can socialise and meet up with people, you know, not sit in the flat on my own, getting very down and depressed" P11.

While overall the sessions were perceived very positively a few negative issues were identified. These included the location of the sessions and them being difficult to get to, having to cook something that the participant did not like or could not eat due to dietary requirements, and the sessions not running during school holidays. Suggestions for improvement were also made and included increasing the frequency and length of the sessions, the complexity of the recipes for more able participants and the kitchen facilities and equipment.

Participants were asked about the potential reasons why they did not participate in both the CK and craft sessions. Participants reported that they were limited in terms of the amount of time they could spend out of the home due to personal responsibilities and that others may have a lack of interest due to their own cooking ability being more advanced than other participants:

"Two ladies from the crafts went (to the community kitchen), they said […] it was really frustrating, because they were like, we've seen this man trying to peel a potato and another one trying to chop garlic and we were like, quick give it to me" S/V18.

3. Health and well-being benefits

Staff, volunteers, and participants perceived there to be many benefits from attending the craft and cooking sessions, for themselves and others. For example, socialising with others, learning new cooking skills and trying new foods were frequently reported by the CK participants, as was learning new crafts by participants who attended the craft sessions. Other benefits reported included increased knowledge about nutrition, learning to be healthier, the physical exercise gained from attending the sessions (walking to the session) and educating individuals about how to reduce HHFW. Attendance was therefore reported to be associated with increased confidence, social interaction, physical activity, and support. These benefits were particularly felt by participants with a mental or physical illness (e.g. anxiety) and those at risk of social isolation because of the death of a spouse, living alone, or retirement:

"It (the CK) just gave me more confidence and stuff. Because obviously I suffer with anxiety and it's helped me, […] make friends and talk to people more and interact with people" P3.

Participants also reported that their involvement in the CK and craft sessions had resulted in new friendships. These friendships were, however, largely confined to the sessions with interactions beyond the sessions rarely occurring. The social contact, friendship and supportive environment offered by the CK, and craft sessions were reported to be missed during the school holidays. Participants reported that stopping the sessions for a short or prolonged period would have a negative impact on them and their wellbeing:

"Oh god yes, […] we miss it when the holidays are on, and we don't meet" P2.

The health and wellbeing benefits reported by participants were not, however, attributed solely to be a result of participating in the CKs and/or craft sessions. They were also attributed to participation in a combination of community activities:

"I can't say it's the kitchen that's impacted my everyday life" P11

"I'm thinking it started (growth in confidence) when they (another participant) started going down to the church on Wednesday" P14.

4. Individual and contextual factors

All the participants attending the CK and/or craft sessions tended to be active in the community, attending at least one other community-based activity once a week:

"I've got other interests as I do all those things on other days" P4.

Participation in community activities was suggested to vary according to area of residence and level of urbanisation, with individuals from smaller towns and villages participating more in community activities:

"I think the villages […] (that) are smaller. I think they go to everything that's on in the village" S/V1.

Similarly, participant demographics were perceived to influence attendance and benefits experienced. For example, participants, staff, and volunteers reported individuals who lived alone, were retired, and had caring responsibilities or those that had physical or cognitive needs benefitted more than younger, more able individuals. Individuals who had carers were also reported to benefit more if they attended without the carer to allow them to carry out the activity independently:

"To be honest if ([participant name's) carer comes, she just takes over" S/V1.

The CK sessions in particular were reported to offer an inclusive environment in which participants could comfortably interact with one another regardless of level of ability and need:

"I just think it its beneficial for […] people of all different abilities and different disabilities" P2.

"You feel that you want to make it inclusive for everybody […]. I mean, I think I think the people that are doing it are really trying to make it all encompassing" P7.

The sessions were reported to offer an opportunity for participants to interact and engage in banter and light-hearted conversations with others about everyday activities. Participants reported that they tended not touch on personal issues to keep the atmosphere light-hearted and less invasive.

Participants also reported that some personalities dominated and/or participated in the session's activity more than others and that they were more likely to seek other community networks (e.g. church) or approach friends and family to discuss the more personal issues they may be experiencing:

> *"Some of them talk about like if their relatives are ill or and they're upset and they're worried" S/V15.*

> *"We're talking about holidays or people going away uhm you know, so it's just general chitchat sort of thing, but not too invasive or whatever" P10.*

5. Expansion of the scheme

While the CK sessions were overall perceived to be beneficial in their current format, suggestions were made for successful expansion of the scheme. Borough Council staff and volunteers reported that running the sessions (particularly the CKs) involved a large amount of responsibility. CK volunteers were expected to choose the recipe for the week, do the shopping for the ingredients, look after the participants, and co-ordinate the activities during the session. Borough Council staff reported that some volunteers have given up volunteering due to these associated demands. Participants who had previously volunteered reported the responsibilities of the role to have become increasingly challenging as they had got older. Successful expansion of the CKs was therefore suggested to involve the recruitment and retention of suitable volunteers (e.g. younger individuals):

> *"It's the volunteers that need to be recruited and retained" S/V18*

Although recruitment and retention of volunteers was perceived to be a barrier to expansion among staff and volunteers, there was a general agreement that the recruitment of participants to newly established kitchens would not be problematic because of the popularity of the kitchens and the benefits experienced from participating.

Suggestions for expanding the scheme, in particular the CKs, included directing the CKs at other audiences (e.g. younger, employed), changing the time and location of the groups so that they would be more accessible to individuals with other responsibilities (e.g. employment, children), and

not associated with particular groups (e.g. churches) or demographics (e.g. deprived). Other suggestions included improved advertising and funding.

Discussion

Results from this process evaluation highlight that reducing HHFW, the initial purpose of the intervention, no longer remains the focus of these CKs. However, the CK and craft scheme was found to be a valued and worthwhile community-based intervention. In line with Fano et al.[16] the primary reason for attendance was reported to be an increased opportunity to socialise. CKs could therefore be effective interventions for reducing risk factors associated with social isolation (e.g. reduced wellbeing, mortality, depression, cognitive decline).[29-31] Notwithstanding this, results suggest that they are not generally effective for establishing and developing meaningful relationships with others, and thus reducing loneliness, outside the CKs themselves. This is important when considering the population groups these CKs appear to attract. Most participants were retired older adults, a population group at higher risk of social isolation and loneliness because of decreased economic and social resources, functional limitations, and the death of significant others.[32] Increased social contact was also reported to be a benefit of these CK by participants with varying cognitive and physical needs and abilities, along with the co-benefits of education and an improved sense of confidence, independence, and general mental health. These health and wellbeing benefits were perceived to result from participating in both the CK and craft sessions, but were particularly evident in the CKs because they encouraged a collaborative activity in an inclusive environment.

The participatory and collaborative nature of the CKs was therefore suggested to be important to the promotion of social interaction and support. This reinforces previous research that suggests effective interventions to be those that offer a social activity and/or support within a group format and when participants are encouraged to be actively involved in the activity.[33] The health and wellbeing benefits reportedly experienced, including increased social interaction, were however reported to operate within a broader context. Individual and contextual factors were reported and observed to contribute to the benefits experienced from attending the CK and craft sessions. For example, participants reported that attending other community activities had encouraged their attendance at the CK, and vice versa. Therefore, the perceived benefits experienced are likely to result from wider social interactions and engagement with the community and community activities

rather than specifically the CKs or craft sessions alone. CKs are therefore suggested to interact with the broader community context in their contribution to increased levels of social interaction.

This was demonstrated to be particularly true for certain groups of individuals, for example, those with social, cognitive or physical needs. The CKs were found to offer these groups of individuals a safe, supportive environment in which to successfully engage with other individuals, with or without assistance. Individual demographics are therefore likely to influence the degree to which the health and wellbeing benefits are experienced. For example, the CKs were reported to be particularly beneficial for individuals with a carer because they can attend the sessions on their own with the support of fellow participants, volunteers and/or staff. Thus, the CKs offer these participants an opportunity to gain physical and social independence. Conversely, the craft session was observed and reported to be particularly beneficial to participants with caring responsibilities, providing them with an opportunity to exercise their independence, by engaging in an activity away from their caring responsibilities.

Attendance at the CK scheme was intended to be open to all individuals, with varying needs and levels of cooking ability as a place where they could learn how to reduce HHFW. Results from the questionnaire, observations and interviews show the CKs to be particularly beneficial to individuals with varying levels of social, cognitive and physical need (e.g., retired, unable to work, disability). This process evaluation has therefore shown the CK initiative to have successfully achieved this inclusivity. Qualitative exploration of reasons for attending found participants to attend due to personal circumstances that limited levels of social interaction (e.g. retired, living alone, disability) on a daily basis. All participants expressed a need to increase their social interaction and that the CKs offered, and were valued, as an effective solution. CKs therefore seem to be effectively reaching those at risk of social isolation and thus in need. Future CKs should therefore consider the population they wish to serve when deciding future CK locations.

Despite the value participants, volunteers and staff placed on the CKs, barriers were reported to impact participation. For example, location, accessibility and advertising were all reported to be problematic, particularly for individuals with limited access to public transport, and/or individuals with physical or cognitive needs. It is therefore important that future CKs consider the population they wish to serve when deciding location and access requirements.

For CKs to continue to result in improved social health, they should increase their focus on active participation and emphasise their contribution to the provision of social support, particularly for socially isolated and vulnerable groups of individuals. A focus on the social benefits of CKs may attract more participants and volunteers as would having CKs located in very accessible locations and based in generic community facilities (i.e. not associated with specific organisations or faith groups) Emphasising these could also help facilitate the branding and advertisement of CKs. Together, this will help drive the expansion of the CK scheme across Leicestershire and beyond, and increase its health and wellbeing benefits.

Strengths and limitations

The location of the CK and craft sessions may have had an impact on the recruitment of participants to the study, as the researcher was unable to attend all sessions and actively recruit participants, having to rely instead on volunteers and staff. Although volunteers and staff were able to recruit 33 participants to the CK questionnaire and four to the craft questionnaire, more may have been recruited if the researcher had had more first-hand interactions with the participants. Moreover, the researcher may have been able to assist with recruiting those participants less likely to volunteer to participate (e.g. participants unable to complete the study materials by themselves due to verbal, literacy of physical limitations), increasing the representativeness of the sample.

Other limitations included the measures being self-report and most of the questionnaires being completed during the CK or craft sessions. Participants may have discussed answers with one another or responded to questions in what they considered the socially desirable way. Completion of the questionnaires during the CK and craft sessions may have also contributed to missing data, and poor reliability of the social interaction scale because some participants may have felt uncomfortable disclosing certain personal information (e.g. income, lack of social interaction) in the presence of others. Moreover, while observation methodology provides researchers with opportunities to experience and describe existing situations, and obtain information that participants may not directly reveal, participants behaviour may have been influenced by the presence of the researcher. The researcher's presence may have also indirectly influenced the way participants interacted and communicated with one another, the session's activity, and the way the session was planned and facilitated by the volunteers. Notwithstanding these limitations, strengths include the process evaluation using mixed methods for data collection (i.e. questionnaires,

observation, and interviews) which help to provide a more in depth understanding of complex phenomena than either quantitative or qualitative approaches alone, and public involvement and input from relevant stakeholder from the start, and throughout the duration of the study.

Conclusion

The reduction of household food waste is no longer the focus of CKs in this study. However, CKs continue to be valued community-based interventions, offering those at risk of social isolation opportunities to socialise. Community kitchens are not necessarily effective for reducing household food waste but they are for improving social health. A refocus of the social benefits of the community kitchens is likely to attract more participants and drive the expansion of the community kitchen scheme across Leicestershire and other geographies. This would result in an increased reach of the CK scheme to those in need, and further improvement of the health and wellbeing of socially isolated and lonely individuals.

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Patient and Public Involvement

Aim

To co-produce with stakeholders and Patient and Public Involvement (PPI) representatives a process evaluation of the Community Kitchen (CK) scheme and maintain meaningful PPI activities throughout the duration of the project.

Methods

PPI was integrated into the main processes of the study. The research protocol was developed via a collaborative Task and Finish Group (TFG) process, including representatives from Leicestershire County Council Environmental, Policy and Public Health teams. The TFG formed the foundation of the Project Management Meeting Group (PMG) who met regularly throughout the project.

PPI representatives were individuals with and without experience of participating/volunteering in the CKs. PPI recruitment was facilitated by Leicestershire County Council and Leicestershire Borough Council staff who were involved in the development, implementation and running of the CKs. A two-hour PPI meeting with three ex-CK attendees and volunteers and three members of the community with no experience of the CKs took place prior to study recruitment to discuss the intended recruitment methods and study materials. Two individuals from the PPI session were then invited to continue their involvement in the study by participating in regular PMG meetings. PPI involvement at key points throughout the study ensured shared decision making, accessibility and inclusivity of the study methods, materials, and dissemination of findings.

Study Findings

Stakeholders and PPI representatives worked collaboratively with the research team during the study design process, providing feedback on the protocol, logic model, methods, and materials. Participant-facing materials, including information sheets and questionnaires were co-developed and piloted with the PPI representatives to minimise any potential barriers to recruitment and completion of study materials. PPI representatives advised on making the questionnaires accessible in paper format rather than online due to accessibility issues for older individuals and individuals with cognitive needs. They also highlighted the importance of improving accessibility of interview participation by providing the option to hold interviews via the phone rather than in person or online.

Discussion and conclusion

Co-production throughout the study provided valued expertise to the research team. PPI representatives contributed to the study design, accessibility, and acceptability of study materials and to the interpretation and continued dissemination of the results.

Reflective/critical perspective

Due to the geographical distance between the research team and the CK intervention, remote contact with stakeholders and PPI representatives was necessary. While this was a barrier to recruiting PPI representatives, the research developed an effective collaboration with the PPI representatives who were recruited and retained for the duration of the study.

Data sharing

Anonymised qualitative transcripts used during the current study are available from the corresponding author on reasonable request.

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