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Original Research

Eat, play, learn well—a novel approach to co-production and analysis grid for environments linked to obesity to engage local communities in a child healthy weight action plan



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ABSTRACT

Objectives: To describe the process of combining Analysis Grid for Environments Linked to Obesity (ANGELO) with community engagement, qualitative and co-production methods to promote local strategies around child healthy weight (CHW) and to highlight steps taken to engage local people in developing a community CHW action plan around two school communities in Dundee, Scotland.

Study design: The Eat, Play, Learn Well (Learn Well) approach applied an action-oriented research approach, using qualitative methods.

Methods: Focus group discussions (FGDs), a co-production approach, and ANGELO were linked by applying a novel three-step process. FGDs were recorded by scribe and following face-to-face interview's key themes were identified using a novel, predefined five-step process, and ANGELO grids were populated. Prioritization events allowed local people to rank most important health statements, with community conversations offering further insights to help create a local CHW action plan.

Results: Three FGDs were conducted with parents ($n = 24$) and two with workers ($n = 15$). Eighty-seven attended a prioritization event at school B (41 adults), 59 attended at school A (35 adults), where each school community chose its top four priorities from 11 health statements developed. Two further community conversations then took place and led to the creation of a CHW action plan with five overarching themes.

Conclusions: The Learn Well test approach helped gain important insights into local environments linked to obesity and production of a pragmatic, step-by-step process suitable for real-life public health practice that can enable local people to identify key early intervention and prevention priorities, in a tangible way.

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Introduction

Scotland's childhood overweight and obesity rates have remained at a high level for the past three decades. It is known that children who grow up in areas of deprivation with high levels of health and social inequalities are disproportionately affected by unhealthy weight.¹

Dundee city is a large Scottish conurbation sitting on the east coast of Scotland, with a population of 148,210, including 23,798 children younger than 16 years.² Based on the Scottish Index of Multiple Deprivation (SIMD), more than 35% of the Dundee population live in the most deprived areas (SIMD quintile 1), compared with a national Scottish average of 19.6%, and more than one quarter of children at primary 1 (age 4–5 years) are overweight or obese. [Table 1](#) compares the community profiles of the East End of Dundee (where this novel approach took place) with the wider Dundee city and Scotland.

A recent systematic review from 85 articles examined the effectiveness of reducing socio-economic inequalities in obesity in children. The review highlighted targeted school-delivered environmental and empowerment interventions to be the most effective. Interestingly, no UK-based studies met the criteria for the inclusion for multilevel interventions.³

According to Swinburn et al., tackling childhood obesity requires changes to our Westernised obesogenic environment and targeting social norms and behavioural changes at a personal, community and national level.⁴ The Ensemble Prévenons l'Obésité Des Enfants (EPODE—Together Let's Prevent Childhood Obesity) has shown that positive changes in population weight are possible when the whole community is involved in taking responsibility. A multistakeholder approach is fundamental to driving development of local sustainable policies and strategies, localising the 'right' message while incorporating monitoring and evaluation of the local programme.⁵ The Analysis Grid for Environments Linked to Obesity (ANGELO) model provides a systematic method for engaging with a community to help them to identify their priorities for healthy weight in their community leading to an action plan which gives a route to making necessary changes and informing policy decisions.^{4,6}

The philosophy of EPODE and the principles of ANGELO sit extremely well with the Scottish Government's policy of co-production in health care.⁷ French et al., 2010, suggest that understanding and engaging people delivering solutions is fundamental for the future of public health interventions, targeting population-level change in behaviour.⁸ Child healthy weight (CHW) became a priority for Dundee in 2014⁹ and was the catalyst for a new test approach called Eat, Play, Learn Well (Learn Well). The work described in this article took place over 18 months and is phase 1 of an ongoing approach to engage with the people of Dundee regarding how they wish to co-produce tackling healthy weight in their community. Learn Well was developed as a 4-year approach; details are outlined in the logic model shown in [Fig. 1](#).

Phase 1 of Learn Well is described in this article, and the objectives are two pronged: (1) to describe the novel application of ANGELO combined with community engagement using qualitative and co-production method to support development of individualised community strategies to promote positive healthy lifestyle; and (2) to highlight the steps taken to engage local people in developing a community child healthy weight action plan with particular emphasis on early intervention and prevention.

Methods

Study design

This qualitative study used co-production and qualitative methodology in combination with ANGELO through a three-step process of the following:

- 1) Mapping and engaging
- 2) Analysing and prioritising
- 3) Shaping a community healthy weight action plan, see [Fig. 2](#).

Ethical approval was not considered necessary as this approach was part of the routine daily work of the authors and their organisations and involved working directly with the general public and not patient groups.

Table 1 – Community profile indicators.

Indicators	East End of Dundee	Dundee city	Scotland
Population living in 20% of most deprived data zones (SIMD quintile 1) ^a	68.1%	36.1%	19.6%
Employment deprived ^a	20.3%	14.2%	10.7%
Income deprived ^a	25.1%	16.4%	12.3%
Unemployed ^a	7.7%	5.7%	4.8%
Population living in 20% of most deprived data zones (health domain) ^a	63.0%	33.5%	19.7%
Children living in most deprived SIMD quintile ^a	76.8%	43.7%	22.1%
Breastfeeding exclusively at 6–8 weeks ^b	15.2%	27.0%	28.2%
Primary 1 prevalence of overweight, obesity and severe obesity (UK 85th BMI centile cut-off point) ^c	27.9%	25.5%	22.1%

BMI, body mass index; SIMD, Scottish Index of Multiple Deprivation; ISD, Information Services Division.

^a National Records for Scotland—Small Area Population Estimates 2015 and Scottish Government's SIMD 2016 via the Health Intelligence Team, NHS Tayside.

^b ISD Scotland—breastfeeding statistics extracted from Child Health Systems Programme PreSchool via the Health Intelligence Team, NHS Tayside.

^c ISD Scotland—obesity—primary 1 BMI Statistics 2016 via the Health Intelligence Team, NHS Tayside.

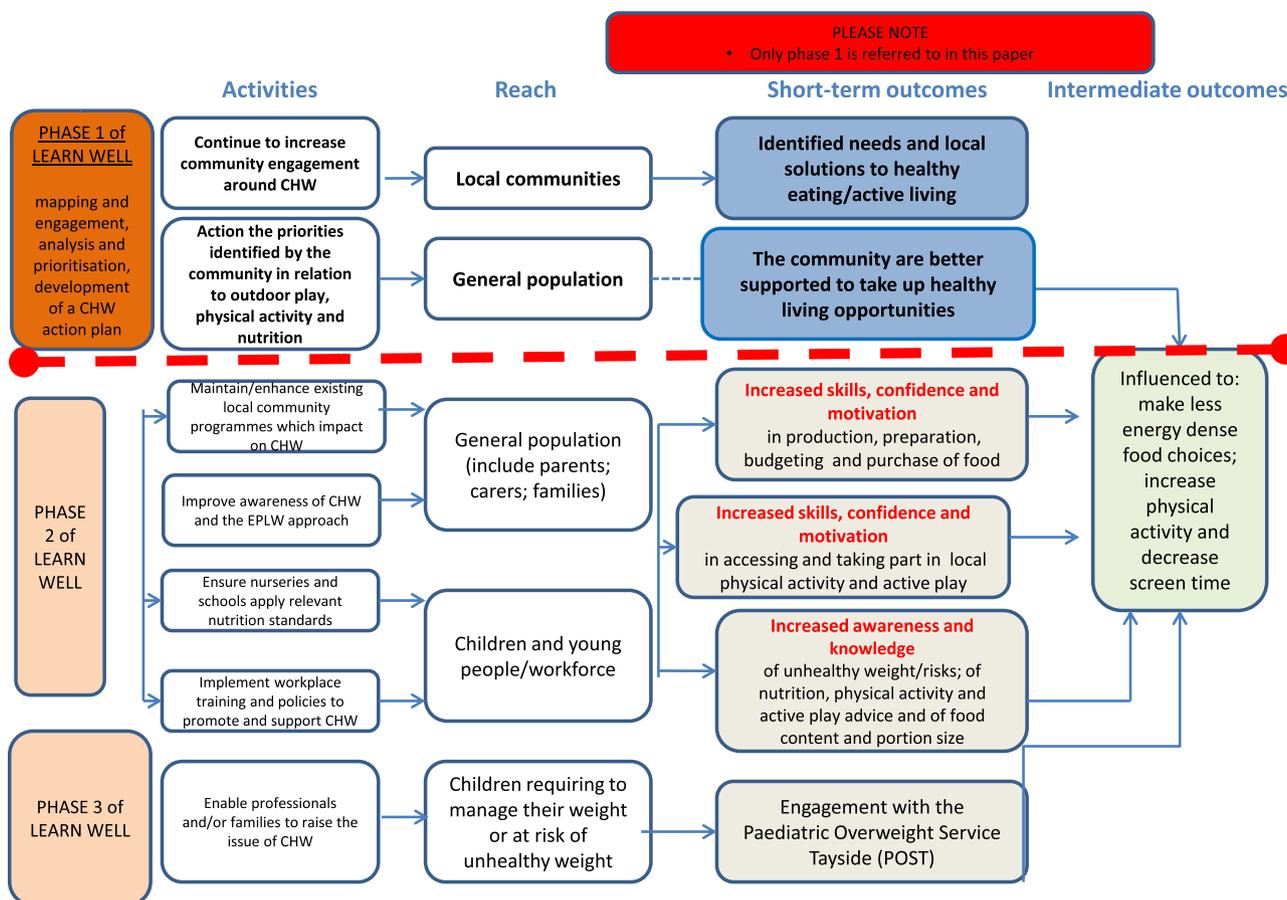


Fig. 1 – Learn Well logic model. Learn Well, Eat, Play, Learn Well; CHW, child healthy weight.

STEP 1 : Mapping & Engagement

Step 2 : Analysis & Prioritisation

Step 3: Community CHW Action Plan

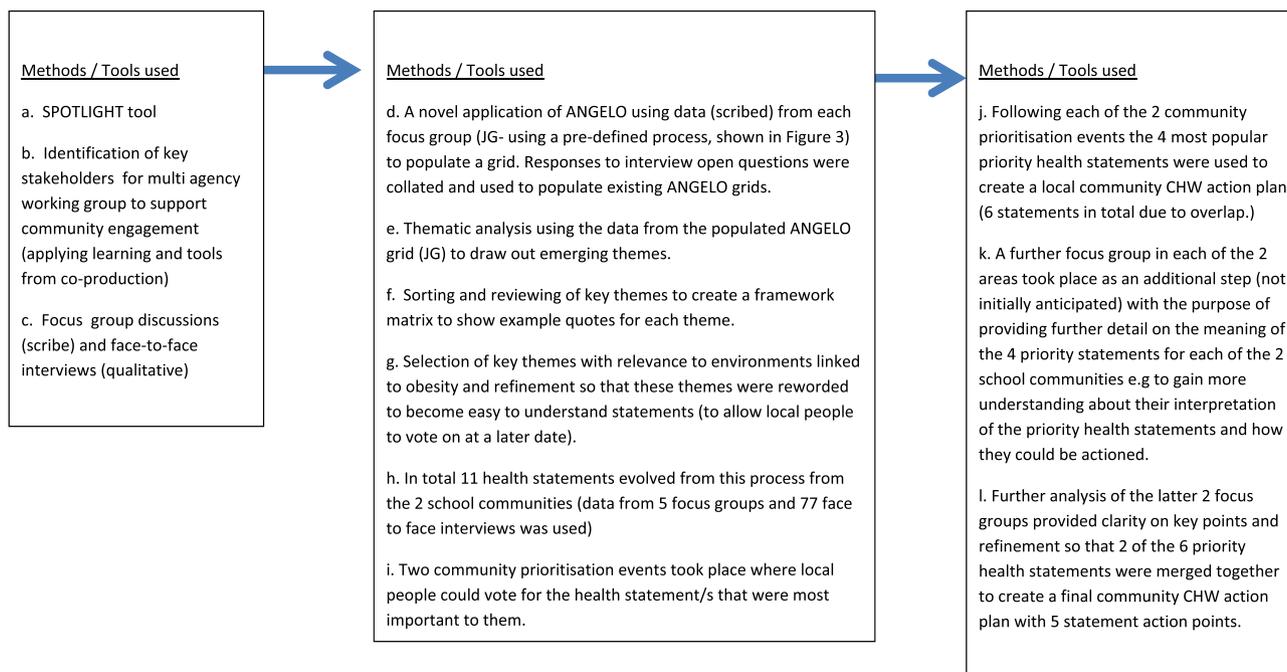


Fig. 2 – Summary of the three-step process involved in Learn Well phase 1. CHW, child healthy weight; Learn Well, Eat, Play, Learn Well; ANGELO, Analysis Grid for Environments Linked to Obesity.

Study setting

Three schools in the East End of the city were selected on prevalence of childhood obesity at primary one, the Scottish Government's Attainment Challenge and local engagement in well-being. Primary schools A, B and C acted as a 'footprint' into the local communities, with school and community workers championing this CHW approach.

Participants

For step 1 focus group discussions (FGDs), participants were invited to take part, promoted by members of the Learn Well implementation group through their network of workers, i.e. health, education, local authority, third sector, community learning and development, adult literacy and established groups of parents, for example, School Parent Council or as part of planned events such as when their child attended a holiday dance group. Recruitment of FGD participants was based simply on the 'living, working or feeling associated with the east end'. All participants agreed in writing to their participation and for responses to be recorded by a scribe. For step 2 prioritisation events, children and their families and other who 'lived' and 'worked' locally were supported and encouraged to attend.

Data collection

In stage 1, a comprehensive mapping exercise was undertaken to profile the potential obesogenic environment of the schools' catchment areas using the Spotlight virtual standard operating procedure.^{10,11} The objective was to assess the key street-level features of the neighbourhood environment in a comprehensive standardised way, which were potentially related to physical activity and dietary behaviours and, in turn, obesity (see [Table 1](#)).

Qualitative data and insights from the FGDs and face-to-face interviews were collected at stage 1. Groups were conducted in a range of comfortable settings within the local community, for example, community centre by a practitioner trained in qualitative research and focus group facilitation (J.G.). Each was observed by a member of the Learn Well implementation group, who acted as a scribe. All group discussions followed a semistructured topic guide and lasted between 1 to 2 h. The topic guide shown in [Table 2](#) was developed in such a way as to include prompts to allow insights gathering into aspects of diet and physical activity experienced at the macrolevel and microlevel as per ANGELO grid. These aspects were explored after general enquiry into health and well-being and before discussions linked to healthy weight.

To capture the views of a wider range of local people, face-to-face interviews using a set questionnaire with open questions shown [Table 3](#) were also undertaken at local community events such as community summer fairs, using opportunistic recruitment methods. This allowed triangulation of data with focus groups.

For consistency in approach, one practitioner (J.G.) devised and used a novel predefined, five-step process outlined in [Fig. 3](#) to analyse each group discussion. This took the form of thematic analysis based on the framework method of content

Table 2 – Focus group topic guide.

Question number	Question
1a	Tell us what a 'healthy lifestyle' means to you:
1b	What does this mean for children? Is it different? Prompts - What about diet? - What about exercise or physical activity?
2a	How easy is it to live a healthy lifestyle in the East End of Dundee?
2b	Tell us about a good experience of being able to make a positive lifestyle choice
2c	Tell us about a bad experience that prevented a positive healthy lifestyle choice Prompts - Local influences, e.g. written schools/leisure versus wider influences, e.g. government - What helps (enablers)? - What makes it difficult (barriers)/what is missing in the local area? - What are the facilities—what is/is not available locally (physically)? - What about cost/time—what are the financial factors locally (economic)? - What about rules/regulations locally—(policy)?
3	What influences people's attitudes to healthy lifestyle? Prompts - What about upbringing/individual or family values and beliefs? - What about peers/friends? - What about the media? - What about health messages (all sociocultural)?
4a	What does 'healthy weight' mean to you as an individual, others in your family?
4b	Is it different for children?
5	What one thing would make a difference to enable healthy lifestyle?

matrix data analysis.^{12–14} An extra step which linked responses to the appropriate section of a two by four ANGELO grid was retrospectively populated with responses for influences affecting physical activity and healthy eating. Responses to open questions from face-to-face interviews were collated and used to populate existing ANGELO grids. All populated ANGELO grids were merged together to form one combined ANGELO grid. The themes, associations and concepts were tested with all members of the Learn Well implementation group. To ensure a transparent audit trail, all paperwork, coding charts and ANGELO grids are available for review. The final ANGELO grid is provided as a supplementary data (see [Appendix](#)).

Themes that emerged most strongly and consistently were worded into 11 positive health statements, to allow people to vote on the statements that matter most to them (see [Table 4](#)). The use of the virtual audit tool Spotlight^{10,11} provided a visual context to the health statements and the later action plan, methods not described in this article.

At stage 2, strength of feeling for the 11 health statements, described previously, was measured by a count of votes cast by participants. Two community engagement prioritising

Table 3 – questionnaire with open questions.

Question number	Question
1	How easy is it for children to live a healthy lifestyle in the East End of Dundee?
2	Tell us about good examples of what is available locally to help children lead a healthy lifestyle?
3	Are there any reasons that people may not access these local opportunities?
4	Tell us what you think is missing to help children be active and eat healthier?
5	On a scale of 0–10, how important do you think it is for children to take part in regular physical activity and play?
6	On a scale of 0–10, how important do you think it is for children to eat a healthy diet?
7	On a scale of 0–10, how important do you think child healthy weight is? E.g for children to be within a healthy weight range for their age

events were held in late September 2016, targeting those who ‘lived’ and ‘worked’ around school A and school B combined with school C. On arrival, participants signed in as a family group and were allocated an ‘engager’ who took them around each poster and using a set script explained the concepts of each health statement. Once all posters had been viewed, each participant, including children, was given four sticky dots and asked to vote for their top four priorities. This voting was carried out on a second set of identical posters displayed in another part of the room. A participant could vote for four separate themes or, if they felt strongly, could put all four votes on one poster. At the close of voting, all the dots were

counted, and the four themes with the highest votes were announced as the community’s chosen four top priorities.

Results

Five FGDs were undertaken in locations across the East End of Dundee ($n = 39$) from April to August 2016; two with parents ($n = 24$) and three with workers ($n = 15$). Three face-to-face engagements took place at local East End community events in June and July 2016, with 77 individuals being interviewed. After the novel predefined five-step process of framework

PROCESS STEP	DESCRIPTION	Notes
Step 1	Familiarise yourself with data (summaries from scribe). Do a listing exercise of all summary statements	This will be a long list!
Step 2	Label each statement in list with a unique number (code) to create a statement list	Statement used to populate ANGELO grid
Step 3	Simplify the long statement list by drawing out key themes that emerge. Label new themes list with a unique letter (label)	Themes list (thematic analysis)
Step 4	Sort and review the themes list into key headings with subtopics (use low level descriptors)	Main heading / subtopic
Step 5	create a framework matrix by using statement list from step 2 to show examples for each subtopic.	Framework matrix

Fig. 3 – Novel predefined five-step process of analysis to populate ANGELO grid. ANGELO, Analysis Grid for Environments Linked to Obesity.

Table 4 – Eleven health statements.

Health statements	Quotes
It is important that places where we do sport/exercise/activity have healthy food options	'Food provision at leisure/activity venues not healthiest – undermining the activity itself.' Worker 'The snack provided at my daughter's dance group is biscuit and juice – it could be healthier.' Parent
It is important that mealtimes at nursery, school, home and work are happy and healthy events	'Lunch is something important that all pupils should share together as part of school day.' Worker 'Siblings' eating habits (fussy) can impact others and be stressful.' Parent
It is important that we have simple, easy-to-understand messages about healthy eating	'It is difficult to know what is relevant and to get access to support for individuals who may want to make some changes.' Worker 'Nothing is healthy, we are told that even strawberries are full of sugar.' Parent
It is important that people can gain knowledge about how to eat healthy on a budget	'Positive skills can be passed on such as how to make a pot of soup.' Worker 'Parents need to be taught not to give children such big portions.' Parent
It is important that people can access cooking skills—including how to plan, organize food shopping	'I know of one man who went to a cooking group and now supports 3 or 4 of his friends to make their meals – it has social benefits.' Worker 'It can be easy if people know what to buy and can access discount supermarkets/shop online for meat.' Parent
It is important that there are activities that the whole family can access together	'Services don't seem geared-up for whole family activities.' Worker 'Cooking classes for the whole family – parents and children together.' Parent
It is important that we realize that there are a high number of fast food and take-away shops and that this may make healthier choice more difficult	'Right of passage – going to chip shop at lunchtime.' Worker
It is important that local people and workers are able to easily access healthy food in their community	'In local shops fruit and vegetables is limited and expensive and there are not many cafes.' Worker 'Supermarkets are not always easy to get to if you have mobility or transport problems.' Parent
It is important that all food eaten in nurseries, primary and secondary schools is in line with healthy eating guidelines	'Eating fruit and veg at nursery can lead to a change in eating new foods.' Worker 'Many children only eat pudding and skip main course because all food put on tray at once.' Parent
It is important that people are able to access local activities and exercise on demand and within a budget	'We need a one stop shop where parents can access information on local activities.' Parent
It is important that there are safe outdoor play options that people of all ages feel they can use in all weathers	'Green spaces like Dawson Park and the Dichty Burn are free. Children used to play down at the Dichty but now parents won't let them.' Worker 'Children should be able to just run a round and play, it doesn't have to be an organized activity.' Parent

analysis and population of an ANGELO grid following each FGD, 11 health statements emerged from merging of the ANGELO grids populated from school A and school B FGDs during step 1.

In total, 87 attended at the primary school B (n = 41 adults, 47%) and 59 at the primary school A (n = 35 adults, 59%) priority ranking events at the end of step 2. Over the two events, the community chose the following four health statements as being the four most important, based on the strength of feeling.

From school A event

- It is important that there are safe outdoor play options that people of all ages feel they can use, in all weathers
- It is important that all food eaten in nurseries and primary and secondary schools is in line with healthy eating guidelines
- It is important that people are able to access local activities and exercise on demand and within the budget
- It is important that there are activities that the whole family can access together

From school B event

- It is important that there are safe outdoor play options that people of all ages feel they can use, in all weathers
- It is important that mealtimes at the nursery, school, home and work are happy and healthy events
- It is important that all food eaten in nurseries and primary and secondary schools is in line with healthy eating guidelines
- It is important that people can gain knowledge about how to eat healthily on a budget.

Combining school A and B preferences meant that as two were common to both communities, there were six priority health statements for the East End community from step 2.

In step 3, three further community conversations (numbers not recorded) that took place in June/July 2017 allowed further drilling down of actions for a final CHW action plan for the East End of Dundee with five overarching themes and a focus on early intervention and prevention, as shown in [Table 5](#).

Table 5 – East End community Healthy Weight Action Plan.

Link/Action	Overarching theme			
	Outdoor play options	Happy healthy mealtime	Healthy eating on a budget	Local activity and exercise for families
Link to priority health statement/s	It is important that there are safe outdoor play options that people of all ages feel they can use in all weathers	It is important that mealtimes at nursery, school, home and work are happy and healthy events	It is important that people can gain knowledge about how to eat healthily on a budget	It is important that there are activities that the whole family can access together. It is important that people are able to access local activities and exercise on demand and within budget
Actions	<ul style="list-style-type: none"> A multiagency group has mapped out the outdoor play and green spaces in the Rowantree/St. Vincent catchment area A school and community outdoor learning and play area will be developed in the existing St. Vincent's playground when the school is demolished in 2019. The local children and families will be engaged to ensure the play area meets their needs 	<ul style="list-style-type: none"> Family cooking groups will be run after school at Rowantree Primary School/Rainbow House A healthy eating and activity group for toddlers and their families will be run in the East End A multiagency short life working group will be convened to explore how best to engage parents around eating behaviours Local companies will be engaged around the topic of healthy lifestyle 	<ul style="list-style-type: none"> A yearly survey of the cost and availability of healthy foods in local shops will be carried out Support will be given to multiagency family cookery groups, particularly after school 	<ul style="list-style-type: none"> A yearly survey of school meals and packed lunches will be carried out in the primary schools The survey result will form the basis of discussions with the school meal providers The Scottish government's 'Better Eating, Better Learning' self survey to be carried out in the schools

Discussion

This article reports on phase 1 of a long-term, three-phased approach called Learn Well that sets out to enable communities in the East End of Dundee to develop a CHW action plan.

Learn Well evolved from discussions on how best to tackle CHW in Dundee between Dundee City Council Integrated Children's Services and NHS Tayside's Paediatric Overweight Service Tayside (POST). Learn Well was overseen by a multi-agency implementation group made up of a range of workers from POST, NHS Public Health, Local Authority, Education, Social Work and the third sector. The principles of community engagement and co-production were at the heart of the Learn Well approach. Combined with ANGELO and Spotlight, they linked in a way so as to ensure the involvement of people living, working or who felt associated with the local community. Government policy documents consistently acknowledge that changes need to be made to local environments in which children are growing up in order that it is easier for children and their families to make healthier lifestyle choices.^{15,16}

This Learn Well test approach took the principles of ANGELO and used them in a novel manner to best suit the local community. It was agreed early in the planning phase that the people living in the community would struggle to attend 2 full days of discussions around healthy weight and obesity as outlined in the ANGELO framework.^{4,6} Therefore, it was decided to use a novel and pragmatic approach of engage community groups step 1 via FGDs to explore people's thoughts and concerns around the subject.

A comprehensive mapping exercise, using Spotlight, provided a context to the priority themes identified in community engagement sessions, although the process and results are out with the scope of this article.^{10,11}

The novel approach of thematic and framework analysis of FGDs, combined with population of ANGELO grids (Fig. 3), led to the development of 11 health statements, which are outlined in Table 4. In step 2, to separate school engagement events gave the wider community an opportunity to vote for health statements that they felt the most important to them, at a suitable localised level. Events were held immediately after school to try and ensure as large an attendance as possible and incorporated fun family activities, such as outdoor play, sports and craft play. After the voting was completed, healthy food was provided for attendees.

After the evening prioritisation events, it was felt necessary to carry out a further step 3 'conversations' in already established community groups to ensure a fuller understanding of the community's expectations of the agreed priorities.

The longer term outcome of the wider Learn Well test approach is to positively influence population weight. However, it is acknowledged that recognisable changes in the population weight status will not be visible for perhaps 10 years. Therefore, short- and medium-term outcomes and outputs have been drawn up through the development of a logic model (Fig. 1) whereby normalising discussion of child healthy weight (CHW) will lead to increase in the number of children referred to community family weight management programmes. This logic model is closely based on work by NHS Health Scotland.¹⁷ The Learn Well implementation group is currently developing

performance indicators to monitor and report progress towards the uptake of healthier lifestyle choices.

The Learn Well approach has since become part of the wider approach to tackling obesity taken forward by a Dundee Healthy Weight Partnership where obesity is now a priority, and the Learn Well implementation group is currently working alongside the community to support delivery of the action plan (Table 5) developed through this process. The approach has been taken to a second local authority area within Tayside.

It is both the strength and limitation that the Learn Well approach is a real-life situation and not a short-term funded project. This has allowed it to be 'organic' and to develop to meet the needs and demands of the community and the organisations involved. Using ANGELO as a systemic tool, but applying it in a novel way, proved to be effective for the purpose of meeting the objectives of this approach. For reasons of pragmatism, it was not deemed efficient for there to be a consistent second person to analyse data from the FGDs and populate ANGELO grids, and this is recognised as a limitation in terms of the possible introduction of bias.

The level of attendance at community prioritisation events is seen as a strength as is the drive and enthusiasm demonstrated by certain members of the implementation group whose vision enabled progression of the approach, despite the lack of dedicated funding or staff resource. Local governance of the approach has at times been difficult owing to rapid strategic changes within the Children and Families Services landscape across Tayside following dictates from the Scottish Government and the development in Scotland of a new integrated health and social care structure.

Moving forward with the approach and ensuring timely feedback to the community was hampered by changes to the implementation group and particularly to the POST team. Membership of the implementation group changed over the life of the approach depending on the focus at particular times, and learning to date would certainly be to ensure faster turnaround of information on actions to the community.

Conclusion

The Learn Well approach has been helpful in gaining important insights into community engagement about local environments linked to obesity. Drawing on elements of co-production methodology, FGDs and a novel application of the ANGELO framework, we facilitated development of a localized CHW action plan for the East End of Dundee. In applying the Learn well approach, we have produced a pragmatic, step-by-step process that enables local people to identify key priorities, in a tangible way. The process is suitable for real-life public health practice in a way that supports the emerging CHW agenda where there is a focus on early intervention and prevention.^{15,16} We recommend other public health practitioners to use the learning from our test approach when applying this methodology. If the Learn Well approach was to be trialled in other settings using an experimental study design, its feasibility could be further tested.

Author statements

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Ethical approval

Not required, approach was part of routine work/public health practice and not a research project.

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Competing interests

None declared.

Author contributions

L.S. and A.W. conceived and led on the approach; L.S. and J.G. conceived the focus groups. J.G. carried out and analysed FGDs. E.M., L.S. and A.W. oversaw the outcomes of the project and development of the action plan. All authors were involved in writing the article and had final approval of submitted and published versions.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhe.2018.09.032>.

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