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Implementation of a community-based, multidisciplinary, family-focused childhood weight management programme: Barriers and facilitators for success

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Title:

Implementation of a community-based, multidisciplinary, family-focused childhood weight management programme: Barriers and facilitators for success

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Implementation; barriers; facilitators; childhood; obesity; community; treatment

ABSTRACT:

Objective: To explore the barriers and facilitators experienced by those implementing a government-funded, community-based, childhood weight management programme.

Design: Qualitative using semi-structured interviews.

Setting: Two geographical regions in the south and west of the Republic of Ireland.

Participants: 29 national and local level stakeholders responsible for implementing the programme including professionals from dietetics, psychology, public health nursing, physiotherapy, health promotion and administration.

Methods: Framework analysis was used to identify barriers and facilitators which were mapped onto six levels of factors influencing implementation outlined by Grol and Wensing: the innovation, the individual professional, the patient, the social context, the organisational context, and the external environment.

Results: Most barriers occurred at the level of the organisational context. For all stakeholders, barriers arose due to the multidisciplinary nature of the programme, including the lack of role clarity and added complexity of working in different locations. Health professionals' low-perceived self-efficacy in approaching the subject of weight with parents and parental resistance to hearing about their child's weight status were barriers to programme implementation at the individual professional and patient levels, respectively. The main facilitators of implementation, occurring at the level of the health professional, included stakeholders' recognition of the need for a weight management programme and personal interest in the area of childhood obesity. Having a local lead and supportive colleagues were further implementation drivers.

Conclusions: This study highlights the complexities associated with implementing a multidisciplinary childhood weight management programme, particularly translating such programmes to a community setting. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. This evidence can be used to develop an implementation plan to support the translation of interventions into real world settings.

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KEYWORDS:

Implementation; barriers; facilitators; childhood; obesity; community

ARTICLE SUMMARY

Article Focus

- International agencies recommend multi-component programmes to treat and manage childhood obesity.

- These recommendations are largely based on small-scale studies conducted in controlled settings with specialised staff, thus limiting their applicability and generalizability to the real-world.

- When introduced under less-controlled conditions, insight into the factors influencing implementation is crucial. Therefore, the aim of this study was to explore and categorise the barriers and facilitators experienced by those implementing a government-funded, community-based, multi-component childhood weight management pilot programme to inform their eventual scale up.

Strengths and limitations

- While this paper describes barriers and facilitators from the perspective of a wide range of stakeholders and provided a thorough overview of the relevant issues, the themes that emerged were relatively homogenous across disciplines which added to the authority of the findings.

- Data were analysed using a systematic approach [1] and an adapted version of the recognised implementation model by Grol and Wensing was used to classify the barriers and facilitators into levels [2].

BACKGROUND:

Childhood obesity is a worldwide public health concern and there is now widespread agreement that the complex aetiology of the issue requires a multifaceted approach to treatment [4-6]. International recommendations agree that initiatives to treat and manage childhood obesity should be family-focused and

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combine healthy eating, physical activity and behavioural components [7]. In 2016, the World Health Organisation published their report of the commission on ending childhood obesity within which they echo these recommendations but also add that they should be delivered by "*multi-professional teams with appropriate training and resources*" [8]pg.11. These recommendations, however, have been largely based on small-scale studies conducted in controlled settings with specialised staff, thus limiting their applicability and generalizability to 'real-world' settings such as communities or hospitals [5].

In public health, once interventions have undergone innovation testing and demonstrated efficacy the next steps include replication and 'scale-up' to larger populations in 'real-world' settings [9]. There are relatively few examples of published studies reporting on the pragmatic application of effective childhood obesity treatment programmes [10, 11]. While implementation issues such as engagement, local context, staffing and funding are likely to be common across many public health interventions [11], little is documented about the experience of those implementing childhood weight management programmes and even fewer studies detail the factors influencing implementation [12]. For example, a lack of providers trained in evidence-based care for childhood obesity was listed by delegates attending a recent conference in the United States as a major barrier to treatment implementation [6]. Furthermore, with the majority of families declining referral and up to 75% of families discontinuing care, poor engagement with families has proven to be a significant challenge facing teams tasked with implementing such programmes [13, 14].

When introduced under less-controlled conditions, insight into the factors influencing implementation is crucial. Therefore, the aim of this study was to explore and categorise the barriers and facilitators experienced by those implementing a government-funded, community-based, multi-component childhood weight management pilot programme to inform their eventual scale up.

METHODS:

Intervention and context

Although trends appear to be stabilising in Ireland, prevalence of childhood obesity remains high [15]. Currently, in Ireland, almost one in four children are either overweight or obese [16] and there is no standardised community-based weight management programme available to those children with obesity. Community programmes are usually provided on an ad-hoc basis and are rarely evaluated or sustained. In an

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attempt to provide universal treatment the Irish Health Service Executive (HSE) planned to pilot the *W82GO-community* programme in two communities with the intention of rolling the programme out nationwide after pilot programme completion.

W82GO aims to improve nutrition, increase physical activity and facilitate behaviour change over one year [17]. It was designed as a hospital-based, family-focused, multidisciplinary programme grounded in behavioural change theory and was modelled on best practice recommendations [5, 7, 8]. The primary goal is a reduction in Body Mass Index Standard Deviation Score and has previously been found to be effective when delivered in a hospital out-patient setting [17].

The *W82GO* programme involves an initial individual assessment to ascertain eligibility followed by two phases. Phase 1 is the initial intensive phase and consists of six weekly group sessions for both the child and his/her parent/carer. These sessions last approximately one and a half to two hours and incorporate educational and practical sessions to increase physical activity, improve nutrition and increase sleep. Upon completion of phase 1, children return with their parents/care-givers for three booster group sessions at three, six and nine months. These sessions aim to encourage the family to continue with lifestyle change and to manage any barriers to change. Finally, at 12 months, the children and their parents/care-givers return for a final individual assessment to document any changes and make plans for sustainment.

For the current study, *W82GO* was adapted and implemented in two community sites (Site A and Site B) from April 2015 for 12 months and subsequently renamed *W82GO-community*. Both sites were chosen as they were part of a national pilot growth measurement programme and included a mix of rural and urban towns in the west and south of Ireland. Initial assessments took place in community healthcare offices while subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre. The programme was offered free of charge and was delivered by a multidisciplinary team of community health professionals including dietitians, physiotherapists, public health nurses, psychologists, health promotion officers and area medical officers. These health professionals were invited to take part in a training programme prior to programme commencement. Training included a needs assessment, a one day educational training course and two days of clinical shadowing with an experienced *W82GO* programme practitioner at the National Children's University Hospital where it was developed. Each community

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practitioner was supplied with a user manual which outlined the programme and detailed the content for both phases.

Study design and sample

A qualitative approach using semi-structured interviews was utilised. All stakeholders involved in implementing the *W82GO-community* pilot programme (n=38) were contacted by email in the first instance and followed up by telephone contact during which the researcher outlined the study aims and methodology. Stakeholders included professionals from dietetics, clinical psychology, public health nursing, physiotherapy, health promotion, administration as well as individuals from both national and local-level management.

Data collection

All participants were invited to take part in face-to-face interviews. However, due to time and scheduling difficulties a mixture of telephone (n=22) and face-to-face (n=7) interviews were conducted between August 2015 and February 2016 (during programme implementation). To ensure consistency all interviews were conducted by a single researcher (EK), trained in qualitative research methods, using a semi structured topic guide. This guide was developed based on relevant literature and focused on seven issues: (1) awareness of the issue of childhood obesity and existing healthy lifestyle programmes, (2) perceived value of and interest in community evidence-based treatment programmes, (3) communication of the *W82GO-community* pilot programme; (4) specific role in implementing *W82GO-community*; (5) barriers and enablers to implementation; (6) perceived successes and challenges experienced and finally (7) recommendations for the future roll-out of childhood weight management programmes in Irish communities. Stakeholders were specifically asked to report on the barriers and facilitators to inform the implementation and eventual scale-up of community-based obesity treatment programmes. Prompts and probes were used throughout the interviews to stimulate discussion. Prior to each interview, participants were informed about the purpose of the study, that participation was voluntary and that they could terminate the interview at any stage for any reason. Signed informed consent was obtained before each interview, which lasted on average 45 minutes. Interviews continued until data saturation was reached, that is when no new themes emerged during the preliminary analysis of three consecutive interviews [18]. Interviews were digitally recorded and transcribed verbatim.

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Data Analysis

Framework analysis was used to analyse the data [1]. This approach enabled the investigation of a priori objectives while also allowing new themes to emerge from the data. One researcher (EK) transcribed and coded each transcript while another (SMH) also undertook initial coding of a selection of transcripts. Similarities and differences between the coding labels and definitions were discussed and the coding framework was refined and applied to the remaining interviews. Codes were synthesised and grouped according to the dominant emergent themes. These themes were mapped onto a framework developed by Grol and Wensing (2004) which specifies six levels of factors that facilitate or impede implementation success: the innovation; the individual professional, the patient; the social context; the organisational context; and the economic and political environment [2]. This framework (Table 1) was chosen because it describes how barriers and facilitators can be identified, categorised, and used for the development of tailored-based implementation strategies to facilitate desired change [2], in this instance implementing the *W82GO-community* programme. Discrepancies on the mapping of themes were discussed until consensus was reached. NVivo (QSR v10) was used to manage data analysis.

Table 1 Barriers to and incentives for change at different levels of healthcare[a]

Level	Barriers / Incentives
Innovation	Advantages in practice, feasibility, credibility, attractiveness, accessibility
Individual Practitioner	Awareness, knowledge, attitude, motivation to change, behavioural routines
Patient	Knowledge, skills, attitude, compliance
Social Context	Opinion of colleagues, culture of the network, collaboration, leadership
Organisational Context	Organisation of care processes, staff, capacities, resources, structures
Economic and Political Context	Financial arrangements, regulations, policies

[a]Grol and Wensing's multilevel model[2]

RESULTS

Stakeholder Characteristics

We contacted 38 stakeholders and recruited 29 interviewees from a range of disciplines and professions, yielding a response rate of 76% (Table 2).

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Table 2 Stakeholder characteristics

	Site A	Site B	National	Total
National Manager	NA	NA	1	1
Local Manager	1	1	x	2
Physiotherapists	2	1	1	4
Dietitians	3	x	x	3
Psychologists	1	1	1	3
Public Health Nurses	6	3	x	9
Area Medical Officers	x	1	x	1
Health Promotion Officers	3	1	x	4
Administration	1	x	1	2
Total	17	8	4	29

Barriers and Facilitators

For all participants, barriers arose due to the multidisciplinary nature of the programme, including the lack of understanding of other disciplines, lack of role clarity as well as the added complexities of working in different locations. Participants' recognition of the need for a childhood obesity programme and their own personal interest in the area were the main drivers of implementation while the presence of a local lead and supportive colleagues were further enabling factors. Table 3 presents the perceived barriers and facilitators from the perspective of the stakeholders mapped onto the six implementation levels with quotations to illustrate each level.

INSERT TABLE 3 – Included as a supplementary file

The Innovation

In terms of the *W82GO-community* pilot programme (innovation), while stakeholders believed it came from a credible source having been developed by one of the national children's hospitals in Ireland, many had doubts over its accessibility and about how well it would transfer to the community setting. This uncertainty resulted in feelings of unease and community practitioners were hesitant to get involved initially. One stakeholder explained how she worried at length about what impact the programme would have on existing services and how feasible it was to run in the community; *"The setting is different. We were taking a programme that was from an acute setting into the community - that possibly was where the breakdown happened because you didn't have the same services. You didn't have people on site. There was travel, there was all these other*

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logistics that weren't thought about when they were moving an acute programme to the community", W82GO021. In particular, stakeholders believed they were dealing with a very different cohort of families than the hospital-based programme as described by the following quote; *"You've a very different kind of child coming into the hospital than you do in the general community. You've a very different kind of parent. Even if you'd a parent who was resistant to hearing about their child being overweight, if they are attending hospital appointments regularly they are obviously already engaged about their child's health... so I believe that's a major barrier straight away that they possibly didn't have to face in the hospital you know?"*, W82GO010.

In addition to the differences in the target group, stakeholders believed the programme was too medicalised for the community setting and some felt it didn't fit with their perception of a healthy lifestyle programme. This was due to the number of health professionals involved and in particular, the involvement of medical staff. Furthermore, many stakeholders thought the collection of clinical markers of disease and medical history during the initial assessments was unnecessary. As one stakeholder described; *"the initial assessments were totally irrelevant. I mean when I heard that bloods were being taken I thought oh for God sake. You know we were supposed to be running a community-based education intervention where the focus should be on changing lifestyles. It's not our job to be diagnosing other problems",* W82GO005.

Individual Professional

While stakeholders both applauded and recognised the need for such an approach to the treatment of childhood obesity, the multidisciplinary nature of the programme created significant barriers to programme implementation. The variety of community health professionals involved in the implementation of *W82GO-community* with differing perspectives and priorities led to role uncertainty and in some cases a perception of disrespect between disciplines. One stakeholder captures this theme in the following quote; *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenge is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives",*W82GO026. Stakeholders described how *"there was quite a lack of understanding of the various discipline roles and responsibilities and some were even unsure of what some disciplines did",* W82GO012. This lack of understanding sometimes resulted in tension between disciplines and created a challenging environment to work in. Others recalled feeling concerned about where

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they fit into the programme and believed a structured programme plan outlining specific roles and responsibilities was lacking.

Another key barrier that emerged at the level of the individual professional was their low perceived self-efficacy in dealing with childhood obesity and/or working with this young age group. In particular, many stakeholders reported their fear of approaching the subject with parents given the risk of upsetting them or *"rocking the boat"*. One stakeholder reported that *"it's something you want to do something about but it can be very difficult to approach the subject with parents. It's a very sensitive issue",* W82GO001. In our study, stakeholders in Site A received motivational interviewing workshops for childhood obesity. This training equipped these stakeholders with increased skills and confidence in working with families on weight management issues. As one stakeholder described, post motivational interviewing training she wasn't *"frightened of dealing with them at all. It's kind of second nature to me now... I know the buzz words, I know exactly what to say to them. And body language, the whole lot",* W82GO002. Others felt it was quite *'alien'* to work with children aged 4-6 years and believed they hadn't the appropriate training to do so.

Despite these barriers, all stakeholders were aware that childhood obesity was an issue in their respective communities and recognised the urgent need for treatment; *"Yeah I think it's a time bomb that went off over the past ten years and that we are behind it, way behind and the sooner we get going and doing whatever we can the better",* W82GO012. Furthermore, stakeholders' personal interest in tackling the issue, and their motivation and dedication to seeing the programme through were what many believed to be the main drivers behind programme completion; *"It went ahead due to a lot of determination and not because it was easily implementable... if that's a word",* W82GO014.

Patient

Low programme uptake was a key issue during implementation. Many stakeholders believe that obesity has become the norm in society and as a result *"people don't recognise overweight people as being in that actual overweight category because it's become normal to be surrounded by overweight people",* W82GO021. In terms of the *W82GO-community* pilot programme, almost all stakeholders indicated that although children measured as obese on the growth charts their parents seemed unaware of any excess weight and once informed, many refused to accept that their child was obese. As a result of this misperception parents didn't

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realise or accept the need for treatment. Speaking of her experience, one stakeholder described how *"other parents just didn't reply or didn't get in touch because they believed everything was ok and there wasn't a problem with their child. They didn't need any programme. I think that definitely was a huge problem out there in the community setting",* W82GO012. Because of this low recognition amongst parents, many stakeholders recalled the resistance they faced when trying to discuss the issue with them and their fear prior to making contact with parents. One stakeholder explained how some parents would *"be really angry so you're taking angry phonecalls in the evening. You know when you come in from a day's work so it was really difficult",* W82GO002.

Social Context

Local level stakeholders believed there was a certain level of *"naïvety"* at national level about the reality of rolling out the pilot programme on the ground. They felt consultation during the planning stage was lacking and that national-level stakeholders had *"little experience of the practical aspects of childhood obesity"* as *"no one was actually working with obese children or even groups on a day to day basis",* W82GO004. As a result unrealistic expectations and timeframes prevailed, particularly during the recruitment phase. This led to frustration and confusion among local-level health professionals during implementation.

Communication between national and local level stakeholders was considered poor. However, the presence of a local lead facilitated the exchange between staff on the ground and management at national level and was seen by almost all stakeholders as crucial for programme implementation. Furthermore, stakeholders felt that because of the multidisciplinary approach of the programme *"you needed someone on the ground"*; if they didn't have a local lead *"pulling all those people and bits together, it wouldn't have worked because running something like this with people dispersed across a whole county and city if difficult"*, W82GO005. The presence of supportive colleagues and management were identified as further enabling factors.

Organisational Context

The multidisciplinary structure of the programme also created barriers at the organisational level. In addition to differing individual perspectives and priorities, the added complexities of working in different locations created difficulties during programme implementation. In many cases stakeholders didn't *"work at the same*

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site… or even the same town which was a challenge" as it *"took up a lot of time organising between schedules and travelling to meet and go through practicalities",* W82GO007.

In addition to these challenges, at the organisational level, stakeholders reported that implementation was hampered due to insufficient resources (i.e. staff and time) and training. It was reported that two other proposed areas withdrew from the pilot programme because of the lack of staff and leadership on the ground to run the programme. Stakeholders felt that they had very different resource issues to the hospital-based teams who are *"within the confines of a hospital… so they would or should have the same vision or focus... whereas we can see now with a community based programme the professionals can be very different in their training, they can have a different ethos in the departments within their community. It's very individual. We have different line managers and different resources to deal with",* W82GO011. Some stakeholders *"didn't want to get involved because of existing workloads"*, and the lack of extra resources or allocated time to implement the pilot. Furthermore, while acknowledging the little time hospital staff had to develop community-specific training, local-level stakeholders felt they needed more *"practical and tailored"* information. Many described the training they received as *'too general'* and stated that *"it would have been very helpful to have had more practical tips on how to actually run the programme session to session with this age group",* W82GO012.

External Environment

In the Grol and Wensing model, the 'economic and political context' refers to financial arrangements, regulations and policies - themes which did not emerge during our research. Therefore, the sixth level was renamed 'external environment' to include wider societal perspectives and determinants.

In terms of the external environment, the lack of existing services to treat and manage childhood obesity meant many stakeholders were excited to come on board and implement this new initiative. One stakeholder described *"waiting for years for something to happen in this area",* W82GO005. The media was recognised as both a barrier and a facilitator to programme implementation. While stakeholders believed TV and radio campaigns have the potential to raise awareness they felt that the issue is *"also getting very bad press"* and being *"hyped up a little bit"* which in itself may make it more difficult for parents to come forward. Additionally, staff felt that the stigma surrounding childhood obesity and weight management programmes

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created a significant barrier to programme implementation as many parents were reluctant to attend or even talk about the issue of weight for fear of singling out or *'labelling'* their child.

Vision for the future

In terms of the future scale up of *W82GO-community*, the majority of stakeholders recommend establishing dedicated childhood obesity teams within the community, *"ideally people who are located at least in the same town",* who can offer a range of interventions for different levels of need. One stakeholder described *"a tiered effect, for example there could be a level one which could be a generic workshop or talk that you could roll-out in lots of schools. A level two then would be a seminar for parents and level three would be a group programme. Level four then could be actual specific one on one interventions".* Having a tiered approach would enable the team to match the level of need with the family and allow families to choose where on the scale they would best fit.

DISCUSSION

Ambiguity surrounds the effectiveness of community-based childhood weight management programmes [19], and little is documented of the factors influencing their implementation in real-world settings. Their impact on public health depends on their implementation at a national scale and therefore knowledge of the determinants affecting implementation is required [20]. This study identified factors that hampered and facilitated the implementation of *W82GO-community* from a wide range of stakeholder perspectives. Findings suggest that more consideration is needed during the planning stages, including the creation of a structured programme plan outlining specific roles and responsibilities. Local-level stakeholders believe they should be involved in this process as they have practical experience of working with families on the ground in their respective communities.

A key barrier to the implementation of *W82GO-community* was parental resistance which occurred at the patient level but is also intrinsically linked to the external environment where the increasing normalisation of overweight and obesity is met with a stigma that surrounds the issue. Stakeholders described parental resistance occurring at every stage of the implementation process. Parents did not appear to recognise the issue in their own children and as a result didn't see the need for treatment or refused to accept that their child was carrying excess weight. Lack of parental awareness regarding their child's weight and resistance

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towards discussing weight issues has been documented in previous research [21-25]. This may be due in part to the belief that obesity has become the norm in society, a point which was suggested by stakeholders in this study, and previously outlined in the literature [26]. It is also possible that parental resistance stems from the stigma that is associated with excess weight and obesity [11, 22-24] or the negative media attention obesity has received. The framing of coverage by media may affect people's views about the causes of childhood obesity and the most appropriate strategies for addressing the problem [27]. This finding highlights the need, at a policy level, for positive awareness-raising campaigns to encourage parental recognition of healthy childhood growth and development, in addition to knowledge regarding the importance of identifying obesity early in childhood. Future research should focus on factors influencing family's decisions to engage or disengage with obesity treatment and provide recommendations on how to encourage participation.

Low perceived self-efficacy in approaching the subject of weight with parents was a barrier facing staff during implementation. Stakeholders in this study see the need for a childhood weight management programme in their communities and acknowledge their professional responsibility to get involved. However, they appear uncomfortable and unequipped to do this. This is consistent with previous research which found that low perceived skills and low perceived self-efficacy hamper the implementation of such programmes [21, 28-31]. In our study motivational interviewing workshops equipped stakeholders in Site A with increased skills and confidence in working with families on weight management issues. Motivational interviewing is a goal-orientated, patient-centred approach based on the use of communication skills to understand individuals' motivation for behaviour change [32] and has been found to be useful when applied in health care settings [33]. We therefore consider it important that healthcare professionals involved in the implementation of obesity programmes receive this training prior to programme commencement.

The multidisciplinary structure of the programme emerged as both a barrier to and facilitator of implementation and spread across many of the levels outlined by Grol and Wensing. While acknowledged that it was required to treat such a complex health issue, it resulted in lack of role clarity, a lack of understanding of specific discipline roles, and led to difficulties in scheduling. This may in part be due to the structure and governance of community health services within Ireland. While there is a vision for multidisciplinary working set out in multiple policy documents and an emphasis on integrated care [34], the system is not set-up to support the concept. Stakeholders believe a simple roundtable introduction whereby practitioners could share

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their professional background and outline their specific role within the project would have helped overcome this ambiguity. They suggest it is a simple but often overlooked detail. Furthermore, stakeholders feel the establishment of a local lead was critical in assisting multidisciplinary working while also facilitating discussion between national and local level. Laws et al. also highlight the importance of having key local individuals responsible for driving and coordinating research translation [35].

Limitations

Some limitations must be acknowledged; social desirability bias is a risk when stakeholders are known to the researcher conducting the interviews. In this case the stakeholders knew the researcher as the programme evaluator. However, we do not believe this to be the case as stakeholders were keen to *"tell their story"*. Furthermore, according to de Casterlé *et al.*, (2012) *"using a preconceived framework runs the risk of prematurely excluding alternative ways of organising the data"*[35]pg.362. However, data was analysed inductively first before mapping onto the Grol and Wensing Framework. In subsequent phases of analysis we adapted the framework to capture the influence of the external environment on implementation.

CONCLUSION

This study highlights the complexities associated with implementing multi-component childhood weight management programmes in the community setting from a wide range of stakeholder perspectives. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. Furthermore, our findings on the challenges of multidisciplinary working and translating hospital programmes to community settings are applicable to the implementation of interventions beyond that of childhood weight management. This evidence should be used to develop implementation plans to improve the translation of interventions into real world settings.

STATEMENTS:

- Authors' contributions

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The authors responsibilities were as follows: EK: was responsible for the design and conduct of the research, and writing of the manuscript. SMH: was involved in data analysis and reviewed drafts of the manuscript. EK, SMH, JH, FS and IJP made critical revisions to the paper and gave final approval of the version to be submitted.

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- Competing interests

The authors declare that they have no competing interests

- Funding

- Data Sharing

Topic guides which were used in the interviews are available as additional supporting files. However, signed confidentiality agreements prevent us from sharing transcripts.

- Ethics approval

Ethical Approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

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Table 3 Perceived Barriers and Facilitators to the Implementation of W82GO in the Community

Levels	Quotations to illustrate the identified levels
The Innovation	
Credibility	(+) *"I suppose because it was attached to an acute hospital and because there was a consultant paediatrician and you had a lot of disciplines and a lot of very competent professionals involved, and that it had been successful when delivered there. That was the main reason I believed in the programme I suppose"*, W82GO003
Attractiveness (i.e. Multidisciplinary nature)	(+) *"I do think the MDT approach was superb. I think that is you're going to do something for a child who is obese then you need it."*
Transferability (i.e. different population, different resource issues)	(-) *"You are talking about a different cohort of families. Families who are already in the system. They are used to going in for appointments. You're talking about a group who've already had difficulties identified by their GP or whoever so by the time they are going for the group they are already sold, they are used to it and they are used to that sort of setting which is very kind of fast and quick-paced and very focused"*, W82GO002
Relevance (e.g. too medicalised)	(-) *"I think the area medical officer, the medical input i think is probably optional or at least part-time. It's of less importance. It medicalised this community programme a bit too much"*, W82GO021
The Individual Professional	
Awareness of the problem / Recognition of need	(+) *"It is a problem, most definitely. I think it's a time bomb that went off over the past 10 years and that we are behind it. Way behind it and the sooner we get going and get doing something the better"*, W82GO013
Personal interest and motivation	(+) *"So that enthusiasm and that dedication made it happen, it was key to its success"*, W82GO011
Low self-efficacy	(-) *"I wouldn't be especially skilled in assessing children you know with obesity and that kind of thing... Or talking to parents about it… I was concerned about my own ability to, to get up to speed fairly quickly"*, W82GO015
Attitudes (i.e. Multidisciplinary perspectives)	(-) *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenges of it is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives"*, W82GO026
The Patient	
Parental Resistance (weight misperception and denial)	(-) *"I think there was a denial that there was anything wrong with their child, or that their child was overweight. There was a total denial about that because the population in general look like their child. Their child may be a little bit above of what the normal population looks like, but they didn't see that as an issue at all."*, W82GO028
	(-) *"Like there was still a reluctance on the part of the parents to accept that their child was obese am that certainly was an issue. So even at this stage they would have had discussions with the public health nurse and the area medical officer and then I would have seen them and they still didn't believe that their child was obese"*, W82GO004
	(-) *"Other parents then just flat out denied that their child was overweight and accused me a being wrong and that they didn't believe me. They often actually compared their children to others you know saying he's not as big as some other fella down the road and i really should be going to have a chat with that mother"*, W82GO008
The Social Context	
Supportive colleagues	(+) *Presence of supportive colleagues "once she came on board there was two of us, it was a lot easier to share the workload and if i couldn't be there for a day she could be there for it so I*

	suppose that definitely took the load off and she also acted as a sounding board you know? If there was something I wasn't sure of I could say what do you think about this and vice-versa. you know what I mean?", W82GO016
Leadership	(+) *"I mean if we didn't have her pulling all those people and bits together it wouldn't have worked. She did a great job in i think the co-ordination role cause i think running something like this with people dispersed across a whole county and city then you need a project manager on the ground.",* W82GO017
Collaboration between national and local teams	(-) *"There was a feeling at a national level that this was just going to be rolled out like 3 a week kind of thing and that everyone would take up on it",* W82GO009
The Organisational Context	
MDT Structure (logistics)	(-) *"I suppose one of the challenges definitely is that the health professionals are all in different places",* W82GO004
Resources	(-) *"I guess time constraints 'cause a lot of people were pressurised for time. Like even ourselves we wouldn't have been able to go to every session and I would have liked to have gone but we just couldn't. We didn't have the time. We didn't have the staff to be able to attend so i think time and resource pressures were the main concerns",* W82GO013
Training	(-) *"It (the training) was as if they were trying to sell us the programme when you know we were already there. We were already sold. I mean we knew why it was important... because of the obesity issue so there was no need to go over all that again. They should have just focused on how to actually implement and deliver the programme",* W82GO011
External Environment	
Lack of existing services	(+) *"There is nothing out there so that's where it was great to have something like W82GO. That if you did see a child that you know there was something. Some sort of pathway"*
Media	(+) *"There was a huge media campaign ongoing around the time we were implementing the programme which got some parents thinking and talking. I mean those things do have a big impact. Things like Operation Transformation that's aired in January have a huge impact. I think we need more media on the impact of childhood obesity and not just the long-term impacts",* W82GO003
	(-) *"I think maybe it's (obesity) hyped up a little bit in the media. I think maybe that in itself could be making things difficult for parents to come forward. We don't have any other disease related issue hyped up as much you know? If you had a child with obesity you would be feeling a small bit cringe like. You'd be wanting to find somewhere private to get some help like you know",* W82GO020
Stigma	(-) *"Wouldn't have their child come to a programme in case they'd be labelled overweight or obese. There is a stigma and just from hearing again I wasn't in the parents room, but just from hearing other colleagues feedback it's the parents fear of feeling judged and blamed",* W82GO002

(+) Facilitators, (-) Barriers.

COREQ Checklist for Qualitative Research:

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Pg. 6
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Pg. 1
3. Occupation	What was their occupation at the time of the study?	Pg. 1
4. Gender	Was the researcher male or female?	Pg. 1
5. Experience and training	What experience or training did the researcher have?	Pg. 6
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Pg. 3
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Pg. 15
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Pg. 1
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Pg. 6-7
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Pg. 6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Pg. 6
12. Sample size	How many participants were in the study?	Pg. 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Pg. 7
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Pg. 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	NA
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Pg. 7
Data collection		

17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Pg. 6
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	NA
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Pg. 6
20. Field notes	Were field notes made during and/or after the interview or focus group?	Yes
21. Duration	What was the duration of the interviews or focus group?	Pg. 6
22. Data saturation	Was data saturation discussed?	Pg. 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Pg. 7
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Pg. 7
27. Software	What software, if applicable, was used to manage the data?	Pg. 7
28. Participant checking	Did participants provide feedback on the findings?	NA
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Pg. 8-13
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Pg. 8-13
31. Clarity of major themes	Were major themes clearly presented in the findings?	Pg. 8-13
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes Pg. 8-13

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Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme: A qualitative study.

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Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme: A qualitative study

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1

ABSTRACT:

Objective: To explore the barriers and facilitators experienced by those implementing a government-funded, community-based, childhood weight management programme.

Design: Qualitative using semi-structured interviews.

Setting: Two geographical regions in the south and west of the Republic of Ireland.

Participants: 29 national and local level stakeholders responsible for implementing the programme including professionals from dietetics, psychology, public health nursing, physiotherapy, health promotion and administration.

Methods: Framework analysis was used to identify barriers and facilitators which were mapped onto six levels of factors influencing implementation outlined by Grol and Wensing: the innovation, the individual professional, the patient, the social context, the organisational context, and the external environment.

Results: Most barriers occurred at the level of the organisational context. For all stakeholders, barriers arose due to the multidisciplinary nature of the programme, including the lack of role clarity and added complexity of working in different locations. Health professionals' low-perceived self-efficacy in approaching the subject of weight with parents and parental resistance to hearing about their child's weight status were barriers to programme implementation at the individual professional and patient levels, respectively. The main facilitators of implementation, occurring at the level of the health professional, included stakeholders' recognition of the need for a weight management programme and personal interest in the area of childhood obesity. Having a local lead and supportive colleagues were further implementation drivers.

Conclusions: This study highlights the complexities associated with implementing a multidisciplinary childhood weight management programme, particularly translating such programmes to a community setting. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. This evidence can be used to develop an implementation plan to support the translation of interventions into real world settings.

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KEYWORDS:

Implementation; barriers; facilitators; childhood; obesity; community

ARTICLE SUMMARY

Strengths and limitations

- This is one of few qualitative studies, and the first in Ireland, that explored the factors that hampered and facilitated the implementation of a community-based, multi-component childhood weight management programme from a wide range of stakeholder perspectives.

- While interviewing a wide range of stakeholders provided a thorough overview of the relevant issues, the themes that emerged were relatively homogenous across disciplines which added to the authority of the findings.

- Data were analysed using a systematic approach and an adapted version of the implementation model by Grol and Wensing was used to classify the barriers and facilitators into levels.

- Using a preconceived framework runs the risk of prematurely excluding other ways of organising the data. However, data was analysed inductively first before mapping onto the Grol and Wensing Framework.

BACKGROUND:

Childhood obesity is a worldwide public health concern and there is now widespread agreement that the complex aetiology of the issue requires a multifaceted approach to treatment [1-3]. International recommendations agree that initiatives to reduce and manage childhood obesity should be family-focused and combine healthy eating, physical activity and behavioural components [2, 4, 5]. In 2016, the World Health Organisation published their report of the commission on ending childhood obesity within which they echo these recommendations but also add that they should be delivered by "*multi-professional teams with appropriate training and resources*" [5]pg.11. These recommendations, however, have been largely based on small-scale studies conducted in controlled settings with specialised staff, thus limiting their applicability and generalizability to 'real-world' settings such as communities or hospitals [2].

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In public health, once interventions have undergone innovation testing and demonstrated efficacy the next steps include replication and 'scale-up' to larger populations in 'real-world' settings [6]. There are relatively few examples of published studies reporting on the pragmatic application of effective childhood obesity treatment programmes [7, 8]. While implementation issues such as engagement, local context, staffing and funding are likely to be common across many public health interventions [8], little is documented about the experience of those implementing childhood weight management programmes and even fewer studies detail the factors influencing implementation [9]. For example, a lack of providers trained in evidence-based care for childhood obesity was listed by delegates attending a recent conference in the United States as a major barrier to treatment implementation [3]. Furthermore, with the majority of families declining referral and up to 75% of families discontinuing care, poor engagement with families has proven to be a significant challenge facing teams tasked with implementing such programmes [10, 11].

When introduced under less-controlled conditions, insight into the factors influencing implementation is crucial. Therefore, the aim of this study was to explore and categorise the barriers and facilitators experienced by those implementing a government-funded, community-based, multi-component childhood weight management pilot programme to inform their eventual scale up.

METHODS:

Intervention and context

Although trends appear to be stabilising in Ireland, prevalence of childhood obesity remains high [12]. Currently, in Ireland, almost one in four children are either overweight or obese [13] and there is no standardised community-based weight management programme available to those children with obesity. Community programmes are usually provided on an ad-hoc basis and are rarely evaluated or sustained. In an attempt to identify a universal treatment the Irish Health Service Executive (HSE) planned to pilot the *W82GO-community* programme in two communities. This programme had previously demonstrated effectiveness in the hospital setting [14]. Its effectiveness in the community setting was to be assessed with the intention of nationwide rollout should the programme demonstrate a positive impact on body mass index (BMI). The Template for Intervention Description and Replication (TIDieR) checklist [15] was used to specify the details of programme delivery and is included in Supplementary file 1.

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In summary, *W82GO* aims to improve nutrition, increase physical activity and facilitate behaviour change over one year [14]. It was designed as a hospital-based, family-focused, multidisciplinary programme grounded in behavioural change theory and was modelled on best practice recommendations [2, 5, 16]. The primary goal was a reduction in Body Mass Index Standard Deviation Score and has previously been found to be effective when delivered in a hospital out-patient setting [14].

The *W82GO* programme involves an initial individual assessment to ascertain family eligibility followed by two phases. Families were eligible for the programme if the child was between 5-7 years old; was obese (BMI ≥98th centile); had no limitations to engaging in physical activity; was not taking medication known to affect body weight; and had at least one parent/carer who was able to attend each of the programme sessions. Siblings were also welcome to attend the sessions. Phase 1 involved an initial intensive phase consisting of six weekly group sessions for both the child and his/her parent/carer. These sessions lasted approximately one and a half to two hours and incorporated educational and practical sessions to increase physical activity, improve nutrition and increase sleep. Upon completion of phase 1, children returned with their parents/care-givers for three booster group sessions at three, six and nine months. These sessions aimed to encourage the family to continue with lifestyle change and to manage any barriers to change. Finally, at 12 months, the children and their parents/care-givers returned for a final individual assessment to document any changes and make plans for sustainment.

For the current study, *W82GO* was adapted and implemented in two community sites (Site A and Site B) from April 2015 for 12 months and subsequently renamed *W82GO-community*. Both sites were chosen as they were part of a national pilot growth measurement programme and included a mix of rural and urban towns in the west and south of Ireland. Initial assessments took place in community healthcare offices while subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre. The programme was offered free of charge and was delivered by existing community health professionals including dietitians, psychologists, public health nurses, physiotherapists, health promotion officers, area medical officers and administrators. These health professionals were brought together as a team and asked to deliver this programme as part of their existing roles. Table 1 outlines their specific responsibilities during programme implementation. All staff were invited to take part in a training programme prior to programme commencement Training included a needs assessment, a one day educational training course and two days of

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clinical shadowing with an experienced *W82GO* programme practitioner at the National Children's University Hospital where it was developed. Each community practitioner was supplied with a user manual which outlined the programme and detailed the content for both phases.

Table 1 Health professional roles during the implementation of W82GO-community

Community Health Professional	Role in implementation of *W82GO-community*
National Manager	Overseeing implementation of W82GO-community in both community sites
Local Manager	Overseeing implementation of W82GO-community at local level. Local manager in Site B was involved in referring to the programme.
Physiotherapists	Involved in initial assessments and delivering programme material
Dietitians	Involved in initial assessments and delivering programme material
Psychologists	Involved in initial assessments and delivering programme material
Public Health Nurses	Referral to the programme
Area Medical Officers	Involved in initial assessments
Health Promotion Officers	Delivering programme material
Administration	Involved in contacting parents re programme sessions

Study design and sample

A qualitative approach using semi-structured interviews was utilised. We adopted a purposive approach to sampling, inviting stakeholders with knowledge and experience of planning, coordinating or delivering of W82GO-community. Stakeholders included professionals from dietetics (n=5), clinical psychology (n=3), public health nursing (n=13), physiotherapy (n=4), health promotion (n=4), medicine (n=4), administration (n=2) as well as individuals from both national and local-level management (n=3). To ensure representation from each stakeholder group and given the small number of individuals in each, we invited all stakeholders to participate. All stakeholders were contacted by email in the first instance and followed up by telephone contact during which the researcher outlined the study aims and methodology.

Data collection

All participants were invited to take part in face-to-face interviews. However, due to time and scheduling difficulties a mixture of telephone (n=22) and face-to-face (n=7) interviews were conducted between August 2015 and February 2016 (during programme implementation). To ensure consistency all interviews were conducted by a single trained qualitative researcher (EK), using a semi structured topic guide. Participants

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knew the interviewer as an independent programme evaluator conducting this research as part of her PhD training. The topic guide was developed based on relevant literature and focused on seven issues: (1) awareness of the issue of childhood obesity and existing healthy lifestyle programmes, (2) perceived value of and interest in community evidence-based treatment programmes, (3) communication of the *W82GO-community* pilot programme; (4) specific role in implementing *W82GO-community*; (5) barriers and enablers to implementation; (6) perceived successes and challenges experienced and finally (7) recommendations for the future roll-out of childhood weight management programmes in Irish communities. Core topics were the same across stakeholders and particular probes were added for specific stakeholder groups depending on their role during programme. For example public health nurses were specifically asked to report on the barriers and facilitators to referral. Prompts and probes were used throughout the interviews to stimulate discussion. Prior to each interview, participants were informed about the purpose of the study, that participation was voluntary and that they could terminate the interview at any stage for any reason. Signed informed consent was obtained before each interview, which lasted on average 45 minutes. Interviews were digitally recorded and transcribed verbatim. Data collection and analysis was iterative. Data saturation was judged to have been reached between interviews 20 and 25. However during recruitment, other stakeholders had expressed an interest in sharing their experience and so were given the opportunity to participate. The data from these interviews overlapped with the existing coding framework and thus contributed to the main themes. Ethical approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

Data Analysis

Framework analysis was used to analyse the data [17]. This approach enabled the investigation of a priori objectives while also allowing new themes to emerge from the data. One researcher (EK) transcribed and coded each transcript while another (SMH) undertook initial coding of a selection of transcripts. Similarities and differences between the coding labels and definitions were discussed and the coding framework was refined and applied to the remaining interviews. While this process was conducted at an early stage of the analysis, the coding process was iterative; emergent codes were added to the framework and contributed to the development of themes across the interviews. Codes were synthesised and grouped according to the dominant emergent themes. Themes were also analysed across stakeholder groups to identify similarities and differences across disciplines and positions. These themes were mapped onto a framework developed by Grol

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and Wensing (2004) which specifies six levels of factors that facilitate or impede implementation success: the innovation; the individual professional, the patient; the social context; the organisational context; and the economic and political environment [18]. Mapping emergent themes to the framework at this stage of the analysis ensured that we did not impose a predefined structure or terminology on participants' accounts. This well-established framework (Table 2) was chosen because it describes how barriers and facilitators can be identified, categorised, and used for the development of tailor-based implementation strategies to facilitate desired change [18], in this instance implementing the *W82GO-community* programme. Discrepancies on the mapping of themes were discussed until consensus was reached. NVivo (QSR v10) was used to manage data analysis.

Table 2 Barriers to and incentives for change at different levels of healthcare[a]

Level	Barriers / Incentives
Innovation	Advantages in practice, feasibility, credibility, attractiveness, accessibility
Individual Practitioner	Awareness, knowledge, attitude, motivation to change, behavioural routines
Patient	Knowledge, skills, attitude, compliance
Social Context	Opinion of colleagues, culture of the network, collaboration, leadership
Organisational Context	Organisation of care processes, staff, capacities, resources, structures
Economic and Political Context	Financial arrangements, regulations, policies

[a]*Grol and Wensing's multilevel model[18]*

RESULTS

Stakeholder Characteristics

We contacted 38 stakeholders and recruited 29 interviewees from a range of disciplines and professions, yielding a response rate of 76% (Table 3).

Table 3 Stakeholder characteristics

	Site A	Site B	National	Total
National Manager	NA	NA	1	1
Local Manager	1	1	x	2
Physiotherapists	2	1	1	4
Dietitians	3	x	x	3
Psychologists	1	1	x	2
Public Health Nurses	6	3	x	9
Area Medical Officers	x	2	x	2
Health Promotion Officers	3	1	x	4

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| Administration | 1 | x | 1 | 2 |
| Total | 17 | 9 | 3 | 29 |

Barriers and Facilitators

For all participants, barriers arose due to the multidisciplinary nature of the programme, including the lack of understanding of other disciplines, lack of role clarity as well as the added complexities of working in different locations. Participants' recognition of the need for a childhood obesity programme and their own personal interest in the area were the main drivers of implementation while the presence of a local lead and supportive colleagues were further enabling factors. Views on the main barriers and facilitators to implementation were consistent across stakeholders; despite different disciplinary backgrounds, they had common experiences as implementers adding to the authority of the findings. Table 4 presents the perceived barriers and facilitators from the perspective of the stakeholders mapped onto the six implementation levels with quotations to illustrate each level.

Table 4 Perceived Barriers and Facilitators to the Implementation of W82GO in the Community

Levels	Quotations to illustrate the identified levels
The Innovation	
Credibility	(+) *"I suppose because it was attached to an acute hospital and because there was a consultant paediatrician and you had a lot of disciplines and a lot of very competent professionals involved, and that it had been successful when delivered there. That was the main reason I believed in the programme I suppose",* W82GO003
Attractiveness (i.e. Multidisciplinary nature)	(+) *"I do think the MDT approach was superb. I think that is you're going to do something for a child who is obese then you need it."*
Transferability (i.e. different population, different resource issues)	(-) *"You are talking about a different cohort of families. Families who are already in the system. They are used to going in for appointments. You're talking about a group who've already had difficulties identified by their GP or whoever so by the time they are going for the group they are already sold, they are used to it and they are used to that sort of setting which is very kind of fast and quick-paced and very focused",* W82GO002
Relevance (e.g. too medicalised)	(-) *"I think the area medical officer, the medical input I think is probably optional or at least part-time. It's of less importance. It medicalised this community programme a bit too much",* W82GO021
The Individual Professional	
Awareness of the problem / Recognition of need	(+) *"It is a problem, most definitely. I think it's a time bomb that went off over the past 10 years and that we are behind it. Way behind it and the sooner we get going and get doing something the better",* W82GO013
Personal interest and motivation	(+) *"So that enthusiasm and that dedication made it happen, it was key to its success",* W82GO011
Low self-efficacy	(-) *"I wouldn't be especially skilled in assessing children you know with obesity and that kind of thing... Or talking to parents about it... I was concerned about my own ability to, to get up to speed fairly quickly",* W82GO015

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Attitudes (i.e. Multidisciplinary perspectives)	(-) *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenges of it is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives"*, W82GO026
The Patient	
Parental Resistance (weight misperception and denial)	(-) *"I think there was a denial that there was anything wrong with their child, or that their child was overweight. There was a total denial about that because the population in general look like their child. Their child may be a little bit above of what the normal population looks like, but they didn't see that as an issue at all"*, W82GO028
The Social Context	
Supportive colleagues	(+)*"Once she came on board there was two of us, it was a lot easier to share the workload and if I couldn't be there for a day she could be there for it so I suppose that definitely took the load off and she also acted as a sounding board you know? If there was something I wasn't sure of I could say what do you think about this and vice-versa, you know what I mean?"*, W82GO016
Leadership	(+) *"I mean if we didn't have her pulling all those people and bits together it wouldn't have worked. She did a great job in I think the co-ordination role cause I think running something like this with people dispersed across a whole county and city then you need a project manager on the ground."*, W82GO017
Collaboration between national and local teams	(-) *"There was a feeling at a national level that this was just going to be rolled out like 3 a week kind of thing and that everyone would take up on it"*, W82GO009
The Organisational Context	
MDT Structure (logistics)	(-) *"I suppose one of the challenges definitely is that the health professionals are all in different places"*, W82GO004
Resources	(-) *"I guess time constraints 'cause a lot of people were pressurised for time. Like even ourselves we wouldn't have been able to go to every session and I would have liked to have gone but we just couldn't. We didn't have the time. We didn't have the staff to be able to attend so i think time and resource pressures were the main concerns"*, W82GO013
Training	(-) *"It (the training) was as if they were trying to sell us the programme when you know we were already there. We were already sold. I mean we knew why it was important... because of the obesity issue so there was no need to go over all that again. They should have just focused on how to actually implement and deliver the programme"*, W82GO011
External Environment	
Lack of existing services	(+) *"There is nothing out there so that's where it was great to have something like W82GO. That if you did see a child that you know there was something. Some sort of pathway"*
Media	(+) *"There was a huge media campaign ongoing around the time we were implementing the programme which got some parents thinking and talking. I mean those things do have a big impact. Things like Operation Transformation that's aired in January have a huge impact. I think we need more media on the impact of childhood obesity and not just the long-term impacts"*, W82GO003
	(-) *"I think maybe it's (obesity) hyped up a little bit in the media. I think maybe that in itself could be making things difficult for parents to come forward. We don't have any other disease related issue hyped up as much you know? If you had a child with obesity you would be feeling a small bit cringe like. You'd be wanting to find somewhere private to get some help like you know"*, W82GO020
Stigma	(-) *"Wouldn't have their child come to a programme in case they'd be labelled overweight or obese. There is a stigma and just from hearing again I wasn't in the parents room, but just from hearing other colleagues feedback it's the parents fear of feeling judged and*

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blamed",W82GO002

(+) Facilitators, (-) Barriers.

The Innovation

In terms of the *W82GO-community* pilot programme (innovation), while stakeholders believed it came from a credible source having been developed by one of the national children's hospitals in Ireland, many had doubts over its accessibility and about how well it would transfer to the community setting. This uncertainty resulted in feelings of unease and community practitioners were hesitant to get involved initially. One stakeholder explained how she worried at length about what impact the programme would have on existing services and how feasible it was to run in the community; *"The setting is different. We were taking a programme that was from an acute setting into the community - that possibly was where the breakdown happened because you didn't have the same services. You didn't have people on site. There was travel, there was all these other logistics that weren't thought about when they were moving an acute programme to the community"*, W82GO021. In particular, stakeholders believed they were dealing with a very different cohort of families than the hospital-based programme as described by the following quote; *"You've a very different kind of child coming into the hospital than you do in the general community. You've a very different kind of parent. Even if you had a parent who was resistant to hearing about their child being overweight, if they are attending hospital appointments regularly they are obviously already engaged about their child's health... so I believe that's a major barrier straight away that they possibly didn't have to face in the hospital you know?"*, W82GO010.

In addition to the differences in the target group, stakeholders believed the programme was too medicalised for the community setting and some felt it did not fit with their perception of a healthy lifestyle programme. This was due to the number of health professionals involved and in particular, the involvement of medical staff. Furthermore, many stakeholders thought the collection of clinical markers of disease and medical history during the initial assessments was unnecessary. As one stakeholder described; *"the initial assessments were totally irrelevant. I mean when I heard that bloods were being taken I thought oh for God sake. You know we were supposed to be running a community-based education intervention where the focus should be on changing lifestyles. It's not our job to be diagnosing other problems"*, W82GO005.

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Individual Professional

While stakeholders both applauded and recognised the need for such an approach to the treatment of childhood obesity, the multidisciplinary nature of the programme created significant barriers to programme implementation. The variety of community health professionals involved in the implementation of *W82GO-community* with differing perspectives and priorities led to role uncertainty and in some cases a perception of disrespect between disciplines. One stakeholder captures this theme in the following quote; *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenge is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives",*W82GO026. Stakeholders described how *"there was quite a lack of understanding of the various discipline roles and responsibilities and some were even unsure of what some disciplines did",* W82GO012. This lack of understanding sometimes resulted in tension between disciplines and created a challenging environment to work in. Others recalled feeling concerned about where they fit into the programme and believed a structured programme plan outlining specific roles and responsibilities was lacking.

Another key barrier that emerged at the level of the individual professional was their low perceived self-efficacy in dealing with childhood obesity and/or working with this young age group. In particular, many stakeholders reported their fear of approaching the subject with parents given the risk of upsetting them or *"rocking the boat".* One stakeholder reported that *"it's something you want to do something about but it can be very difficult to approach the subject with parents. It's a very sensitive issue",* W82GO001. In our study, stakeholders in Site A received motivational interviewing workshops for childhood obesity. This training equipped these stakeholders with increased skills and confidence in working with families on weight management issues. As one stakeholder described, post motivational interviewing training she wasn't *"frightened of dealing with them [parents] at all", It's kind of second nature to me now... I know the buzz words, I know exactly what to say to them. And body language, the whole lot",* W82GO002. Others felt it was quite *"alien"* to work with children aged 4-6 years and believed they hadn't the appropriate training to do so.

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Despite these barriers, all stakeholders were aware that childhood obesity was an issue in their respective communities and recognised the urgent need for treatment; *"Yeah I think it's a time bomb that went off over the past ten years and that we are behind it, way behind and the sooner we get going and doing whatever we can the better",* W82GO012. Furthermore, stakeholders' personal interest in tackling the issue, and their motivation and dedication to seeing the programme through were what many believed to be the main drivers behind programme completion; *"It went ahead due to a lot of determination and not because it was easily implementable... if that's a word",* W82GO014.

Patient

Low programme uptake was a key issue during implementation. Many stakeholders believe that obesity has become the norm in society and as a result *"people don't recognise overweight people as being in that actual overweight category because it's become normal to be surrounded by overweight people",* W82GO021. In terms of the *W82GO-community* pilot programme, almost all stakeholders indicated that although children measured as obese on the growth charts their parents seemed unaware of any excess weight and once informed, many refused to accept that their child was obese. As a result of this misperception parents did not realise or accept the need for treatment. Speaking of her experience, one stakeholder described how *"other parents just didn't reply or didn't get in touch because they believed everything was ok and there wasn't a problem with their child. They didn't need any programme. I think that definitely was a huge problem out there in the community setting",* W82GO012. Because of this low recognition amongst parents, many stakeholders recalled the resistance they faced when trying to discuss the issue with them and their fear prior to making contact with parents. One stakeholder explained how some parents would *"be really angry so you're taking angry phone calls in the evening. You know when you come in from a day's work so it was really difficult",* W82GO002.

Social Context

Local level stakeholders believed there was a certain level of *"naïvety"* at national level about the reality of rolling out the pilot programme on the ground. They felt consultation during the planning stage was lacking and that national-level stakeholders had *"little experience of the practical aspects of childhood obesity"* as *"no one was actually working with obese children or even groups on a day to day basis",* W82GO004. As a result

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unrealistic expectations and timeframes prevailed, particularly during the recruitment phase. This led to frustration and confusion among local-level health professionals during implementation.

Communication between national and local level stakeholders was considered poor. However, the presence of a local lead facilitated the exchange between staff on the ground and management at national level and was seen by almost all stakeholders as crucial for programme implementation. Furthermore, stakeholders felt that because of the multidisciplinary approach of the programme *"you needed someone on the ground"*; if they did not have a local lead *"pulling all those people and bits together, it wouldn't have worked because running something like this with people dispersed across a whole county and city is difficult"*, W82GO005. The presence of supportive colleagues and management were identified as further enabling factors.

Organisational Context

The multidisciplinary structure of the programme also created barriers at the organisational level. In addition to differing individual perspectives and priorities, the added complexities of working in different locations created difficulties during programme implementation. In many cases stakeholders didn't *"work at the same site… or even the same town which was a challenge"* as it *"took up a lot of time organising between schedules and travelling to meet and go through practicalities"*, W82GO007.

In addition to these challenges, at the organisational level, stakeholders reported that implementation was hampered due to insufficient resources (i.e. staff and time) and training. It was reported that two other proposed areas withdrew from the pilot programme because of the lack of staff and leadership on the ground to run the programme. Stakeholders felt that they had very different resource issues to the hospital-based teams who are *"within the confines of a hospital… so they would or should have the same vision or focus... whereas we can see now with a community based programme the professionals can be very different in their training, they can have a different ethos in the departments within their community. It's very individual. We have different line managers and different resources to deal with"*, W82GO011. Some stakeholders *"didn't want to get involved because of existing workloads"*, and the lack of extra resources or allocated time to implement the pilot. Furthermore, while acknowledging the little time hospital staff had to develop community-specific training, local-level stakeholders felt they needed more *"practical and tailored"* information. Many described the training they received as *'too general'* and stated that *"it would have been*

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very helpful to have had more practical tips on how to actually run the programme session to session with this age group", W82GO012.

External Environment

In the Grol and Wensing model, the 'economic and political context' refers to financial arrangements, regulations and policies - themes which did not emerge during our research. Therefore, the sixth level was renamed 'external environment' to include wider societal perspectives and determinants.

In terms of the external environment, the lack of existing services to treat and manage childhood obesity meant many stakeholders were excited to come on board and implement this new initiative. One stakeholder described *"waiting for years for something to happen in this area",* W82GO005. The media was recognised as both a barrier and a facilitator to programme implementation. While stakeholders believed TV and radio campaigns have the potential to raise awareness they felt that the issue is *"also getting very bad press"* and being *"hyped up a little bit"* which in itself may make it more difficult for parents to come forward. Additionally, staff felt that the stigma surrounding childhood obesity and weight management programmes created a significant barrier to programme implementation as they believed many parents were reluctant to attend or even talk about the issue of weight for fear of singling out or *'labelling'* their child.

Vision for the future

In terms of the future scale up of *W82GO-community*, the majority of stakeholders recommend establishing dedicated childhood obesity teams within the community, *"ideally people who are located at least in the same town",* who can offer a range of interventions for different levels of need. One stakeholder described *"a tiered effect, for example there could be a level one which could be a generic workshop or talk that you could roll-out in lots of schools. A level two then would be a seminar for parents and level three would be a group programme. Level four then could be actual specific one on one interventions".* Having a tiered approach would enable the team to match the level of need with the family and allow families to choose where on the scale they would best fit.

DISCUSSION

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This study identifies the barriers and facilitators to implementing a community-based weight management programme from the perspective of stakeholders tasked with delivering such a programme. While community-based weight management programmes have become an important response to the obesity epidemic given their potential reach and accessibility for families, the majority are based on small, efficacy trials [2] and little is known about the factors influencing their implementation in real-world settings. Our findings suggest that more consideration is needed during the planning stages, including the creation of a structured programme plan outlining specific roles and responsibilities. Local-level stakeholders believe they should be involved in this process as they have practical experience of working with families on the ground in their respective communities.

A key barrier to the implementation of *W82GO-community* was perceived parental resistance which occurred at the patient level but is also intrinsically linked to the external environment where the increasing normalisation of overweight and obesity coexists with a stigma that surrounds the issue. Stakeholders delivering the programme described parental resistance occurring at every stage of the implementation process and suggested that parents did not appear to recognise the issue in their own children. As a result stakeholders believed that parents did not see the need for treatment or refused to accept that their child was carrying excess weight. While parental attitudes reported in this study were based on the perceptions of staff, a lack of parental awareness regarding their child's weight and resistance towards discussing weight issues has been documented in previous research [19-23]. This may be due in part to the belief that obesity has become the norm in society, a point which was suggested by stakeholders in this study, and previously outlined in the literature [24]. It is also possible that parental resistance stems from the stigma that is associated with excess weight and obesity [8, 20-22] or the negative media attention obesity has received. The framing of coverage by media may affect people's views about the causes of childhood obesity and the most appropriate strategies for addressing the problem [25]. Our findings highlight the need, at a policy level, for positive awareness-raising campaigns to encourage parental recognition of healthy childhood growth and development, in addition to knowledge regarding the importance of identifying obesity early in childhood.

Low perceived self-efficacy in approaching the subject of weight with parents was a barrier facing staff during implementation. Stakeholders in this study see the need for a childhood weight management programme in their communities and acknowledge their professional responsibility to get involved. However, they appear

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uncomfortable and unequipped to do this. This is consistent with previous research which found that low perceived skills and low perceived self-efficacy hamper the implementation of such programmes [19, 26-29]. In our study motivational interviewing workshops equipped stakeholders in Site A with increased skills and confidence in working with families on weight management issues. Motivational interviewing is a goal-orientated, patient-centred approach based on the use of communication skills to understand individuals' motivation for behaviour change [30] and has been found to be useful when applied in health care settings [31]. We therefore consider it important that healthcare professionals involved in the implementation of obesity programmes receive this training prior to programme commencement.

The multidisciplinary structure of the programme emerged as both a barrier to and facilitator of implementation and spread across many of the levels outlined by Grol and Wensing. While acknowledged that it was required to treat such a complex health issue, it resulted in lack of role clarity, a lack of understanding of specific discipline roles, and led to difficulties in scheduling. This may in part be due to the structure and governance of community health services within Ireland. While there is a vision for multidisciplinary working set out in multiple policy documents and an emphasis on integrated care [32], the system is not set-up to support the concept. Stakeholders believe a simple roundtable introduction whereby practitioners could share their professional background and outline their specific role within the project would have helped overcome this ambiguity. They suggest it is a simple but often overlooked detail. Furthermore, stakeholders feel the establishment of a local lead was critical in assisting multidisciplinary working while also facilitating discussion between national and local level. Laws et al. also highlight the importance of having key local individuals responsible for driving and coordinating research translation [33].

Finally, an important finding from this research was the inherent problems in a *'one size fits all'* approach to community-based treatment. Stakeholders in our study suggest a tiered approach may be more suitable, beginning with a brief intervention which intensifies based on a child's degree of obesity, the family's motivation, and the capacity of the community and/or healthcare provider. This finding is in line with a suggestion from Staniford et al. who suggest that future interventions should tailor treatment according to participants' age, degree of obesity and their readiness or confidence to change [34]. In addition to tailoring a programme to the individual, programmes need to be adapted for the community setting. Stakeholders in our study raised concerns that the W82GO programme, having been developed in a hospital setting, was too

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medicalised for community practice. In particular, the lengthy assessment process which in some cases involved blood tests and the presence of medically trained doctors, was unnecessary for a community-based lifestyle programme. This finding is consistent with previous research conducted by Watson et al. who evaluated a family-based childhood obesity treatment intervention and found they needed to modify the assessment process by replacing community pediatrician assessments with parent/carer self-completion forms for reasons of time and cost [35]. To develop a full picture of treatment, future research should examine what aspects of the programme work, for whom, in what context and why.

While this study provides important insight into the implementation of childhood obesity programme in the community, several limitations should be acknowledged. According to de Casterlé *et al.*, (2012) *"using a preconceived framework runs the risk of prematurely excluding alternative ways of organising the data"*[36]pg.362. However, data was analysed inductively first before mapping emergent themes onto the Grol and Wensing Framework. In subsequent phases of analysis we adapted the framework to capture the influence of the external environment on implementation. Social desirability bias is a risk when stakeholders are known to the researcher conducting the interviews. In this case the stakeholders knew the researcher as the programme evaluator. However, we do not believe this bias had an effect as stakeholders were keen to *"tell their story".* It is also important to note that parental attitudes reported in this study were based on the perceptions of staff delivering the programme. Other studies have identified differences between parents, staff and children in terms of their attitudes towards childhood obesity treatment [34]. We are conducting further research with parents and children to understand the factors influencing their decisions to engage or disengage with obesity treatment.

CONCLUSION

In light of the dearth of knowledge available on the translation of multi-component childhood weight management programmes to community settings, this study highlights the barriers and facilitators to implementing such programmes from a wide range of community healthcare and admin perspectives. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. Furthermore, our findings on the challenges of multidisciplinary working and translating hospital programmes to community settings are applicable to the implementation of interventions beyond that of childhood weight management.

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This evidence should be used to develop implementation plans to improve the translation of interventions into real world settings.

STATEMENTS:

- Authors' contributions

The authors responsibilities were as follows: EK: was responsible for the design and conduct of the research, and writing of the manuscript. SMH: was involved in data analysis and reviewed drafts of the manuscript. EK, SMH, JH, FS and IJP made critical revisions to the paper and gave final approval of the version to be submitted.

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- Competing interests

The authors declare that they have no competing interests

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- Data Sharing

Topic guides which were used in the interviews are available as additional supporting files. However, signed confidentiality agreements prevent us from sharing transcripts.

- Ethics approval

Ethical Approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

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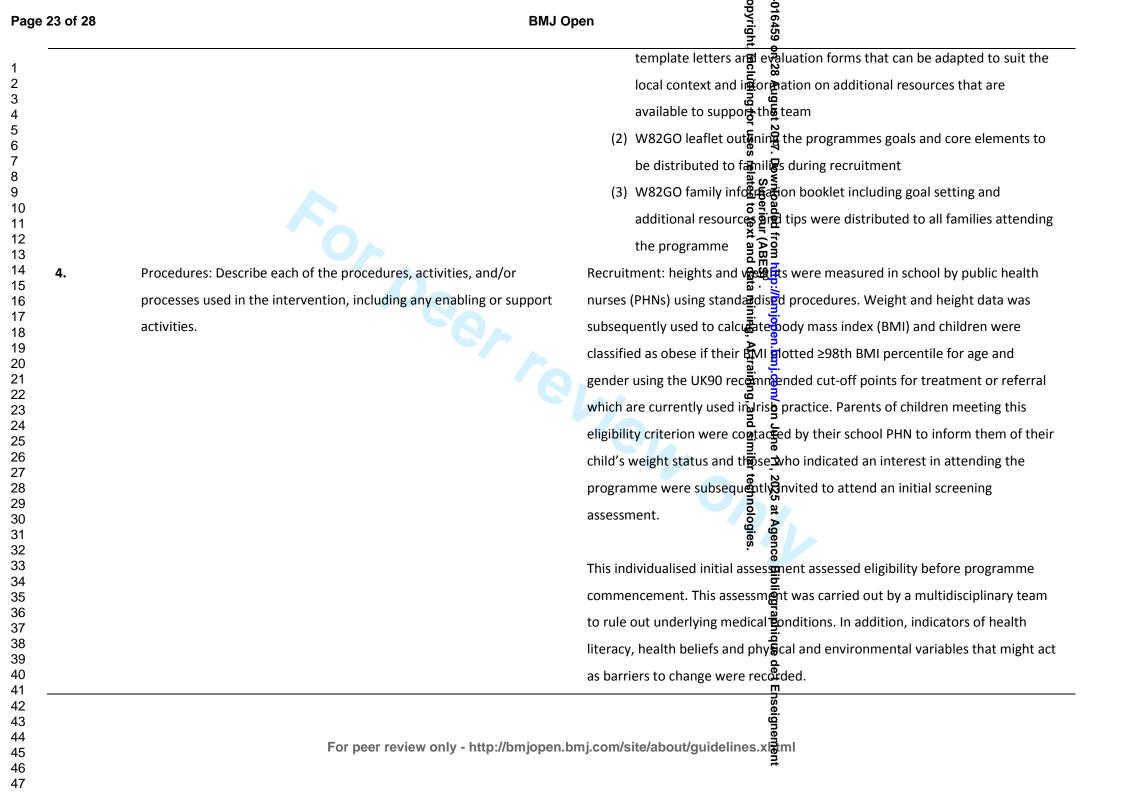
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Supplementary Material 1: Completed TIDieR checklist

TiDieR

Template for Intervention Description and Replication

The TIDieR (Template for Intervention Description and Replication) Checklist

Information to include when describing an intervention and the location of the information

Item number	Item	
	BRIEF NAME	
1.	Provide the name or a phrase that describes the intervention.	*'W82GO-community'* – a multi-component, family-focused childhood weight management pilot programme delivered in the community setting.
	WHY	
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.	The *W82GO-community* programme is a family-focused programme grounded in behavioural change theory (transtheoretical model and social cognitive theory) and aims to reduce obesity in children with BMI ≥98th percentile, improve children's dietary intake, physical activity levels and weight status while also increasing children's quality of life and psychosocial health.
	WHAT	
3.	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	The *W82GO-community* programme includes: (1) The *W82GO-community* pilot programme was delivered by a multi-disciplinary team using a manual developed to support community-based healthcare professionals to deliver the programme in their area. It does so through the provision of a guide to setting up a team and preparing the delivery of the programme; a framework for individual sessions that allows for session preparation and planning including programme presentations on disc; materials, including

template letters and evaluation forms that can be adapted to suit the local context and information on additional resources that are available to support the team

(2) W82GO leaflet outlining the programmes goals and core elements to be distributed to families during recruitment

(3) W82GO family information booklet including goal setting and additional resources and tips were distributed to all families attending the programme

4. Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.

Recruitment: heights and weights were measured in school by public health nurses (PHNs) using standardised procedures. Weight and height data was subsequently used to calculate body mass index (BMI) and children were classified as obese if their BMI plotted ≥98th BMI percentile for age and gender using the UK90 recommended cut-off points for treatment or referral which are currently used in Irish practice. Parents of children meeting this eligibility criterion were contacted by their school PHN to inform them of their child's weight status and those who indicated an interest in attending the programme were subsequently invited to attend an initial screening assessment.

This individualised initial assessment assessed eligibility before programme commencement. This assessment was carried out by a multidisciplinary team to rule out underlying medical conditions. In addition, indicators of health literacy, health beliefs and physical and environmental variables that might act as barriers to change were recorded.

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Following the initial assessment six group sessions took places over six weeks and group booster sessions occurred at three, six and nine months. During these group sessions parents and their children received an educational session for the first hour. Children were taken out to complete physical activity for the last 30 minutes while parents an received extra educational session. At 12 months another individualised final assessment took place to document any changes and make plans for sustainment.

WHO PROVIDED

5. For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.

The W82GO community-programme was delivered by a multidisciplinary team of community health professionals including dietitians, physiotherapists, public health nurses, psychologists, health promotion officers, area medical officers, administrators and local area management. These health professionals had varying levels of experience of dealing with childhood obesity and as a result were invited to take part in a training programme prior to programme commencement. Training included a needs assessment, a one day educational training course and two days of clinical shadowing with an experienced *W82GO* programme practitioner at Temple Street Children's University Hospital in Dublin, Ireland. Each community practitioner was also supplied with a user manual which outlined the programme and detailed the content for both phases.

Public health nurses in one of the sites received motivational interviewing training specific to childhood obesity as part of routine training in the area already being conducted in that area.

HOW

6.	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	The W82GO-community programme involved face-to-face sessions and included a mixture of group and individualised sessions as outlined above.
	WHERE	
7.	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	Initial assessments took place in community healthcare offices. Subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre.
	WHEN and HOW MUCH	
8.	Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.	The programme was run in two sites (Site A and Site B) over 12 months. The individual assessment lasted approximately one and half to two hours. The initial intensive phase consisted of 6 weekly group sessions for both the child and his/her parent/carer and these occurred over one afternoon a week and lasted approximately one and a half to two hours. The three booster sessions at three, six and nine months lasted approximately one to one and a half hours. During these group sessions parents and their children received an educational session for the first hour. Children were taken out to complete physical activity for the last 30 minutes while parents an received extra educational session.
	TAILORING	
9.	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	All families received the same intervention.
	MODIFICATIONS	
10.‡	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	Two sites delivered the pilot programme to their respective communities. Site A decided to separate children and parents from the start of the group sessions because they felt children of this age would not gain anything nor

were likely to understand the educational sessions. Children received a full physical activity session instead, while parents received the educational session alone.

Owing to low numbers attending the programme in Site B programme staff chose not to go ahead with the final assessment at 12 months and instead conducted the final assessments during the third booster session.

HOW WELL

11.	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	Fidelity of intervention delivery was assessed using trainer self-reports and exit interviews.
12.[‡]	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	In Site A, the programme was delivered in a more interactive manner (i.e. without the use of programme slides). Site B followed the manuals as planned.

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol or other published papers (provide citation details) or a website (provide the URL).

‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348:g1687) which contains an explanation and elaboration for each item.

* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).

COREQ Checklist for Qualitative Research:

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Pg. 6
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Pg. 1, 6 & 7
3. Occupation	What was their occupation at the time of the study?	Pg. 1, 6
4. Gender	Was the researcher male or female?	Pg. 1,6
5. Experience and training	What experience or training did the researcher have?	Pg. 6
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Pg. 3
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Pg. 15
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Pg. 1,3,6
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Pg. 6-7
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Pg. 6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Pg. 6
12. Sample size	How many participants were in the study?	Pg. 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Pg. 7
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Pg. 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	NA
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Pg. 7
Data collection		

17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Pg. 6
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	NA
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Pg. 6
20. Field notes	Were field notes made during and/or after the interview or focus group?	Yes
21. Duration	What was the duration of the interviews or focus group?	Pg. 6
22. Data saturation	Was data saturation discussed?	Pg. 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Pg. 7
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Pg. 7
27. Software	What software, if applicable, was used to manage the data?	Pg. 7
28. Participant checking	Did participants provide feedback on the findings?	NA
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Pg. 8-13
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Pg. 8-13
31. Clarity of major themes	Were major themes clearly presented in the findings?	Pg. 8-13
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes Pg. 8-13

BMJ Open

Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme in Ireland: A qualitative study

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Title:

Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme in Ireland: A qualitative study

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ABSTRACT:

Objective: To explore the barriers and facilitators experienced by those implementing a government-funded, community-based, childhood weight management programme.

Design: Qualitative using semi-structured interviews.

Setting: Two geographical regions in the south and west of the Republic of Ireland.

Participants: 29 national and local level stakeholders responsible for implementing the programme including professionals from dietetics, psychology, public health nursing, physiotherapy, health promotion and administration.

Methods: Framework analysis was used to identify barriers and facilitators which were mapped onto six levels of factors influencing implementation outlined by Grol and Wensing: the innovation, the individual professional, the patient, the social context, the organisational context, and the external environment.

Results: Most barriers occurred at the level of the organisational context. For all stakeholders, barriers arose due to the multidisciplinary nature of the programme, including the lack of role clarity and added complexity of working in different locations. Health professionals' low-perceived self-efficacy in approaching the subject of weight with parents and parental resistance to hearing about their child's weight status were barriers to programme implementation at the individual professional and patient levels, respectively. The main facilitators of implementation, occurring at the level of the health professional, included stakeholders' recognition of the need for a weight management programme and personal interest in the area of childhood obesity. Having a local lead and supportive colleagues were further implementation drivers.

Conclusions: This study highlights the complexities associated with implementing a multidisciplinary childhood weight management programme, particularly translating such programmes to a community setting. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. This evidence can be used to develop an implementation plan to support the translation of interventions into real world settings.

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KEYWORDS:

Implementation; barriers; facilitators; childhood; obesity; community

ARTICLE SUMMARY

Strengths and limitations

- This is one of few qualitative studies, and the first in Ireland, that explored the factors that hampered and facilitated the implementation of a community-based, multi-component childhood weight management programme from a wide range of stakeholder perspectives.

- While interviewing a wide range of stakeholders provided a thorough overview of the relevant issues, the themes that emerged were relatively homogenous across disciplines which added to the authority of the findings.

- Data were analysed using a systematic approach and an adapted version of the implementation model by Grol and Wensing was used to classify the barriers and facilitators into levels.

- Using a preconceived framework runs the risk of prematurely excluding other ways of organising the data. However, data was analysed inductively first before mapping onto the Grol and Wensing Framework.

BACKGROUND:

Childhood obesity is a worldwide public health concern and there is now widespread agreement that the complex aetiology of the issue requires a multifaceted approach to treatment [1-3]. International recommendations agree that initiatives to reduce and manage childhood obesity should be family-focused and combine healthy eating, physical activity and behavioural components [2, 4, 5]. In 2016, the World Health Organisation published their report of the commission on ending childhood obesity within which they echo these recommendations but also add that they should be delivered by "*multi-professional teams with appropriate training and resources*" [5]pg.11. These recommendations, however, have been largely based on small-scale studies conducted in controlled settings with specialised staff, thus limiting their applicability and generalizability to 'real-world' settings such as communities or hospitals [2].

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In public health, once interventions have undergone innovation testing and demonstrated efficacy the next steps include replication and 'scale-up' to larger populations in 'real-world' settings [6]. There are relatively few examples of published studies reporting on the pragmatic application of effective childhood obesity treatment programmes [7, 8]. While implementation issues such as engagement, local context, staffing and funding are likely to be common across many public health interventions [8], little is documented about the experience of those implementing childhood weight management programmes and even fewer studies detail the factors influencing implementation [9]. For example, a lack of providers trained in evidence-based care for childhood obesity was listed by delegates attending a recent conference in the United States as a major barrier to treatment implementation [3]. Furthermore, with the majority of families declining referral and up to 75% of families discontinuing care, poor engagement with families has proven to be a significant challenge facing teams tasked with implementing such programmes [10, 11].

When introduced under less-controlled conditions, insight into the factors influencing implementation is crucial. Therefore, the aim of this study was to explore and categorise the barriers and facilitators experienced by those implementing a government-funded, community-based, multi-component childhood weight management pilot programme to inform their eventual scale up.

METHODS:

Intervention and context

Although trends appear to be stabilising in Ireland, prevalence of childhood obesity remains high [12]. Currently, in Ireland, almost one in four children are either overweight or obese [13] and there is no standardised community-based weight management programme available to those children with obesity. Community programmes are usually provided on an ad-hoc basis and are rarely evaluated or sustained. In an attempt to identify a universal treatment the Irish Health Service Executive (HSE) planned to pilot the *W82GO-community* programme in two communities. This programme had previously demonstrated effectiveness in the hospital setting [14]. Its effectiveness in the community setting was to be assessed with the intention of nationwide rollout should the programme demonstrate a positive impact on body mass index (BMI). The Template for Intervention Description and Replication (TIDieR) checklist [15] was used to specify the details of programme delivery and is included in Supplementary file 1.

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In summary, *W82GO* aims to improve nutrition, increase physical activity and facilitate behaviour change over one year [14]. It was designed as a hospital-based, family-focused, multidisciplinary programme grounded in behavioural change theory and was modelled on best practice recommendations [2, 5, 16]. The primary goal was a reduction in Body Mass Index Standard Deviation Score and has previously been found to be effective when delivered in a hospital out-patient setting [14].

The *W82GO* programme involves an initial individual assessment to ascertain family eligibility followed by two phases. Families were eligible for the programme if the child was between 5-7 years old; was obese (BMI ≥98th centile); had no limitations to engaging in physical activity; was not taking medication known to affect body weight; and had at least one parent/carer who was able to attend each of the programme sessions. Siblings were also welcome to attend the sessions. Phase 1 involved an initial intensive phase consisting of six weekly group sessions for both the child and his/her parent/carer. These sessions lasted approximately one and a half to two hours and incorporated educational and practical sessions to increase physical activity, improve nutrition and increase sleep. Upon completion of phase 1, children returned with their parents/care-givers for three booster group sessions at three, six and nine months. These sessions aimed to encourage the family to continue with lifestyle change and to manage any barriers to change. Finally, at 12 months, the children and their parents/care-givers returned for a final individual assessment to document any changes and make plans for sustainment.

For the current study, *W82GO* was adapted and implemented in two community sites (Site A and Site B) from April 2015 for 12 months and subsequently renamed *W82GO-community*. Both sites were chosen as they were part of a national pilot growth measurement programme and included a mix of rural and urban towns in the west and south of Ireland. Initial assessments took place in community healthcare offices while subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre. The programme was offered free of charge and was delivered by existing community health professionals including dietitians, psychologists, public health nurses, physiotherapists, health promotion officers, area medical officers and administrators. These health professionals were brought together as a team and asked to deliver this programme as part of their existing roles. Table 1 outlines their specific responsibilities during programme implementation. All staff were invited to take part in a training programme prior to programme commencement. Training included a needs assessment, a one day educational training course and two days of

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clinical shadowing with an experienced *W82GO* programme practitioner at the National Children's University Hospital where it was developed. Each community practitioner was supplied with a user manual which outlined the programme and detailed the content for both phases.

Table 1 Health professional roles during the implementation of W82GO-community

Health Professional	Role in implementation of *W82GO-community*
National Manager (n=1)	Overseeing implementation of W82GO-community in both community sites
Local Manager (n=2)	Overseeing implementation of W82GO-community at local level. Local manager in Site B was involved in referring to the programme.
Physiotherapists (n=4)	Involved in initial assessments and delivering programme material
Dietitians (n=5)	Involved in initial assessments and delivering programme material
Psychologists (n=3)	Involved in initial assessments and delivering programme material
Public Health Nurses (n=13)	Referral to the programme
Area Medical Officers (n=4)	Involved in initial assessments
Health Promotion Officers (n=4)	Delivering programme material
Administration (n=2)	Involved in contacting parents re programme sessions

Study design and sample

A qualitative approach using semi-structured interviews was utilised. We adopted a purposive approach to sampling, inviting stakeholders with knowledge and experience of planning, coordinating or delivering *W82GO-community.* To ensure representation from each stakeholder group and given the small number of individuals in each, we invited all stakeholders to participate (n=38, see table 1). All stakeholders were contacted by email in the first instance and followed up by telephone contact during which the researcher outlined the study aims and methodology.

Data collection

All participants were invited to take part in face-to-face interviews. However, due to time and scheduling difficulties a mixture of telephone and face-to-face interviews were conducted between August 2015 and February 2016 (during programme implementation). To ensure consistency all interviews were conducted by a single trained qualitative researcher (EK), using a semi structured topic guide. Participants knew the interviewer as an independent programme evaluator conducting this research as part of her PhD training. The topic guide was developed based on relevant literature and focused on seven issues: (1) awareness of the

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issue of childhood obesity and existing healthy lifestyle programmes, (2) perceived value of and interest in

community evidence-based treatment programmes, (3) communication of the *W82GO-community* pilot

programme; (4) specific role in implementing *W82GO-community*; (5) barriers and enablers to

implementation; (6) perceived successes and challenges experienced and finally (7) recommendations for the

future roll-out of childhood weight management programmes in Irish communities. Core topics were the same

across stakeholders and particular probes were added for specific stakeholder groups depending on their role

during the programme. For example public health nurses were specifically asked to report on the barriers and

facilitators to referral. Prompts and probes were used throughout the interviews to stimulate discussion. Prior

to each interview, participants were informed about the purpose of the study, that participation was voluntary

and that they could terminate the interview at any stage for any reason. Signed informed consent was

obtained before each interview, which lasted on average 45 minutes. Interviews were digitally recorded and

transcribed verbatim. Data collection and analysis was iterative. Data saturation was judged to have been

reached between interviews 20 and 25. However during recruitment, other stakeholders had expressed an

interest in sharing their experience and so were given the opportunity to participate. The data from these

interviews overlapped with the existing coding framework and thus contributed to the main themes. Ethical

approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

Data Analysis

Framework analysis was used to analyse the data [17]. This approach enabled the investigation of a priori

objectives while also allowing new themes to emerge from the data. One researcher (EK) transcribed and

coded each transcript while another (SMH) undertook initial coding of a selection of transcripts. Similarities

and differences between the coding labels and definitions were discussed and the coding framework was

refined and applied to the remaining interviews. While this process was conducted at an early stage of the

analysis, the coding process was iterative; emergent codes were added to the framework and contributed to

the development of themes across the interviews. Codes were synthesised and grouped according to the

dominant emergent themes. Themes were also analysed across stakeholder groups to identify similarities and

differences across disciplines and positions. These themes were mapped onto a framework developed by Grol

and Wensing (2004) which specifies six levels of factors that facilitate or impede implementation success: the

innovation; the individual professional, the patient; the social context; the organisational context; and the

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economic and political environment [18]. Mapping emergent themes to the framework at this stage of the analysis ensured that we did not impose a predefined structure or terminology on participants' accounts. This well-established framework (Table 2) was chosen because it describes how barriers and facilitators can be identified, categorised, and used for the development of tailor-based implementation strategies to facilitate desired change [18], in this instance implementing the *W82GO-community* programme. Discrepancies on the mapping of themes were discussed until consensus was reached. NVivo (QSR v10) was used to manage data analysis.

Table 2 Barriers to and incentives for change at different levels of healthcare[a]

Level	Barriers / Incentives
Innovation	Advantages in practice, feasibility, credibility, attractiveness, accessibility
Individual Practitioner	Awareness, knowledge, attitude, motivation to change, behavioural routines
Patient	Knowledge, skills, attitude, compliance
Social Context	Opinion of colleagues, culture of the network, collaboration, leadership
Organisational Context	Organisation of care processes, staff, capacities, resources, structures
Economic and Political Context	Financial arrangements, regulations, policies

[a]*Grol and Wensing's multilevel model[18]*

RESULTS

Stakeholder Characteristics

We contacted 38 stakeholders and recruited 29 interviewees (7 face-to-face, 22 telephone) from a range of disciplines and professions, yielding a response rate of 76% (Table 3).

Table 3 Stakeholder characteristics

	Site A	Site B	National	Total
National Manager	NA	NA	1	1
Local Manager	1	1	x	2
Physiotherapists	2	1	1	4
Dietitians	3	x	x	3
Psychologists	1	1	x	2
Public Health Nurses	6	3	x	9
Area Medical Officers	x	2	x	2
Health Promotion Officers	3	1	x	4
Administration	1	x	1	2
Total	17	9	3	29

Barriers and Facilitators

For all participants, barriers arose due to the multidisciplinary nature of the programme, including the lack of understanding of other disciplines, lack of role clarity as well as the added complexities of working in different locations. Participants' recognition of the need for a childhood obesity programme and their own personal interest in the area were the main drivers of implementation while the presence of a local lead and supportive colleagues were further enabling factors. Views on the main barriers and facilitators to implementation were consistent across stakeholders; despite different disciplinary backgrounds, they had common experiences as implementers adding to the authority of the findings. Table 4 presents the perceived barriers and facilitators from the perspective of the stakeholders mapped onto the six implementation levels with quotations to illustrate each level.

Table 4 Perceived Barriers and Facilitators to the Implementation of W82GO in the Community

Levels	Quotations to illustrate the identified levels
The Innovation	
Credibility	(+) *"I suppose because it was attached to an acute hospital and because there was a consultant paediatrician and you had a lot of disciplines and a lot of very competent professionals involved, and that it had been successful when delivered there. That was the main reason I believed in the programme I suppose",* W82GO003
Attractiveness (i.e. Multidisciplinary nature)	(+) *"I do think the MDT approach was superb. I think that is you're going to do something for a child who is obese then you need it."* W82GO018
Transferability (i.e. different population, different resource issues)	(-) *"You are talking about a different cohort of families. Families who are already in the system. They are used to going in for appointments. You're talking about a group who've already had difficulties identified by their GP or whoever so by the time they are going for the group they are already sold, they are used to it and they are used to that sort of setting which is very kind of fast and quick-paced and very focused",* W82GO002
Relevance (e.g. too medicalised)	(-) *"I think the area medical officer, the medical input I think is probably optional or at least part-time. It's of less importance. It medicalised this community programme a bit too much",* W82GO021
The Individual Professional	
Awareness of the problem / Recognition of need	(+) *"It is a problem, most definitely. I think it's a time bomb that went off over the past 10 years and that we are behind it. Way behind it and the sooner we get going and get doing something the better",* W82GO013
Personal interest and motivation	(+) *"So that enthusiasm and that dedication made it happen, it was key to its success",* W82GO011
Low self-efficacy	(-) *"I wouldn't be especially skilled in assessing children you know with obesity and that kind of thing... Or talking to parents about it... I was concerned about my own ability to, to get up to speed fairly quickly",* W82GO015

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Attitudes (i.e. Multidisciplinary perspectives)	(-) *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenges of it is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives"*, W82GO026
The Patient	
Parental Resistance (weight misperception and denial)	(-) *"I think there was a denial that there was anything wrong with their child, or that their child was overweight. There was a total denial about that because the population in general look like their child. Their child may be a little bit above of what the normal population looks like, but they didn't see that as an issue at all"*, W82GO028
The Social Context	
Supportive colleagues	(+)*"Once she came on board there was two of us, it was a lot easier to share the workload and if I couldn't be there for a day she could be there for it so I suppose that definitely took the load off and she also acted as a sounding board you know? If there was something I wasn't sure of I could say what do you think about this and vice-versa, you know what I mean?"*, W82GO016
Leadership	(+) *"I mean if we didn't have her pulling all those people and bits together it wouldn't have worked. She did a great job in I think the co-ordination role cause I think running something like this with people dispersed across a whole county and city then you need a project manager on the ground."*, W82GO017
Collaboration between national and local teams	(-) *"I did feel there was a very big gap once the decision had been made nationally to roll this out, there was a very big gap then us on the ground and them, there was no consultation or collaboration with people on the ground and I think that's where the problem was"*, W82GO003
The Organisational Context	
MDT Structure (logistics)	(-) *"I suppose one of the challenges definitely is that the health professionals are all in different places"*, W82GO004
Resources	(-) *"I guess time constraints 'cause a lot of people were pressurised for time. Like even ourselves we wouldn't have been able to go to every session and I would have liked to have gone but we just couldn't. We didn't have the time. We didn't have the staff to be able to attend so i think time and resource pressures were the main concerns"*, W82GO013
Training	(-) *"It (the training) was as if they were trying to sell us the programme when you know we were already there. We were already sold. I mean we knew why it was important... because of the obesity issue so there was no need to go over all that again. They should have just focused on how to actually implement and deliver the programme"*, W82GO011
External Environment	
Lack of existing services	(+) *"There is nothing out there so that's where it was great to have something like W82GO. That if you did see a child that you know there was something. Some sort of pathway"*
Media	(+) *"There was a huge media campaign ongoing around the time we were implementing the programme which got some parents thinking and talking. I mean those things do have a big impact. Things like Operation Transformation that's aired in January have a huge impact. I think we need more media on the impact of childhood obesity and not just the long-term impacts"*, W82GO003
	(-) *"I think maybe it's (obesity) hyped up a little bit in the media. I think maybe that in itself could be making things difficult for parents to come forward. We don't have any other disease related issue hyped up as much you know? If you had a child with obesity you would be feeling a small bit cringe like. You'd be wanting to find somewhere private to get some help like you know"*, W82GO020
Stigma	(-) *"Wouldn't have their child come to a programme in case they'd be labelled overweight or obese. There is a stigma and just from hearing again I wasn't in the parents room, but just from hearing other colleagues feedback it's the parents fear of feeling judged and*

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blamed",W82GO002

(+) Facilitators, (-) Barriers.

The Innovation

In terms of the *W82GO-community* pilot programme (innovation), while stakeholders believed it came from a credible source having been developed by one of the national children's hospitals in Ireland, many had doubts over its accessibility and about how well it would transfer to the community setting. This uncertainty resulted in feelings of unease and community practitioners were hesitant to get involved initially. One stakeholder explained how she worried at length about what impact the programme would have on existing services and how feasible it was to run in the community; *"The setting is different. We were taking a programme that was from an acute setting into the community - that possibly was where the breakdown happened because you didn't have the same services. You didn't have people on site. There was travel, there was all these other logistics that weren't thought about when they were moving an acute programme to the community"*, W82GO021. In particular, stakeholders believed they were dealing with a very different cohort of families than the hospital-based programme as described by the following quote; *"You've a very different kind of child coming into the hospital than you do in the general community. You've a very different kind of parent. Even if you had a parent who was resistant to hearing about their child being overweight, if they are attending hospital appointments regularly they are obviously already engaged about their child's health... so I believe that's a major barrier straight away that they possibly didn't have to face in the hospital you know?"*, W82GO010.

In addition to the differences in the target group, stakeholders believed the programme was too medicalised for the community setting and some felt it did not fit with their perception of a healthy lifestyle programme. This was due to the number of health professionals involved and in particular, the involvement of medical staff. Furthermore, many stakeholders thought the collection of clinical markers of disease and medical history during the initial assessments was unnecessary. As one stakeholder described; *"the initial assessments were totally irrelevant. I mean when I heard that bloods were being taken I thought oh for God sake. You know we were supposed to be running a community-based education intervention where the focus should be on changing lifestyles. It's not our job to be diagnosing other problems"*, W82GO005.

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Individual Professional

While stakeholders both applauded and recognised the need for a multidisciplinary approach to the treatment of childhood obesity, it created significant barriers to programme implementation. The variety of community health professionals involved in the implementation of *W82GO-community* with differing perspectives and priorities led to role uncertainty and in some cases a perception of disrespect between disciplines. One stakeholder captures this theme in the following quote; *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenge is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives",*W82GO026. Stakeholders described how *"there was quite a lack of understanding of the various discipline roles and responsibilities and some were even unsure of what some disciplines did",* W82GO012. This lack of understanding sometimes resulted in tension between disciplines and created a challenging environment to work in. Others recalled feeling concerned about where they fit into the programme and believed a structured programme plan outlining specific roles and responsibilities was lacking.

Another key barrier that emerged at the level of the individual professional was their low perceived self-efficacy in dealing with childhood obesity and/or working with this young age group. In particular, many stakeholders reported their fear of approaching the subject with parents given the risk of upsetting them or *"rocking the boat".* One stakeholder reported that *"it's something you want to do something about but it can be very difficult to approach the subject with parents. It's a very sensitive issue",* W82GO001. In our study, stakeholders in Site A received motivational interviewing workshops for childhood obesity. This training equipped these stakeholders with increased skills and confidence in working with families on weight management issues. As one stakeholder described, post motivational interviewing training she wasn't *"frightened of dealing with them [parents] at all", It's kind of second nature to me now... I know the buzz words, I know exactly what to say to them. And body language, the whole lot",* W82GO002. Others felt it was quite *"alien"* to work with children aged 5-6 years and believed they had not the appropriate training to do so.

Despite these barriers, all stakeholders were aware that childhood obesity was an issue in their respective communities and recognised the urgent need for treatment; *"Yeah I think it's a time bomb that went off over*

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the past ten years and that we are behind it, way behind and the sooner we get going and doing whatever we can the better", W82GO012. Furthermore, stakeholders' personal interest in tackling the issue, and their motivation and dedication to seeing the programme through were what many believed to be the main drivers behind programme completion; *"It went ahead due to a lot of determination and not because it was easily implementable... if that's a word",* W82GO014.

Patient

Low programme uptake was a key issue during implementation. Many stakeholders believe that obesity has become the norm in society and as a result *"people don't recognise overweight people as being in that actual overweight category because it's become normal to be surrounded by overweight people",* W82GO021. In terms of the *W82GO-community* pilot programme, almost all stakeholders indicated that although children measured as obese on the growth charts their parents seemed unaware of any excess weight and once informed, many refused to accept that their child was obese. As a result of this misperception parents did not realise or accept the need for treatment. Speaking of her experience, one stakeholder described how *"other parents just didn't reply or didn't get in touch because they believed everything was ok and there wasn't a problem with their child. They didn't need any programme. I think that definitely was a huge problem out there in the community setting",* W82GO012. Because of this low recognition amongst parents, many stakeholders recalled the resistance they faced when trying to discuss the issue with them and their fear prior to making contact with parents. One stakeholder explained how some parents would *"be really angry so you're taking angry phone calls in the evening. You know when you come in from a day's work so it was really difficult",* W82GO002.

Social Context

Local level stakeholders believed there was a certain level of *"naïvety"* at national level about the reality of rolling out the pilot programme on the ground. They felt consultation during the planning stage was lacking and that national-level stakeholders had *"little experience of the practical aspects of childhood obesity"* as *"no one was actually working with obese children or even groups on a day to day basis",* W82GO004. As a result unrealistic expectations and timeframes prevailed, particularly during the recruitment phase. This led to frustration and confusion among local-level health professionals during implementation.

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Communication between national and local level stakeholders was considered poor. However, the presence of a local lead facilitated the exchange between staff on the ground and management at national level and was seen by almost all stakeholders as crucial for programme implementation. Furthermore, stakeholders felt that because of the multidisciplinary approach of the programme *"you needed someone on the ground"*; if they did not have a local lead *"pulling all those people and bits together, it wouldn't have worked because running something like this with people dispersed across a whole county and city is difficult"*, W82GO005. The presence of supportive colleagues and management were identified as further enabling factors.

Organisational Context

The multidisciplinary structure of the programme also created barriers at the organisational level. In addition to differing individual perspectives and priorities, the added complexities of working in different locations created difficulties during programme implementation. In many cases stakeholders didn't *"work at the same site… or even the same town which was a challenge"* as it "*took up a lot of time organising between schedules and travelling to meet and go through practicalities"*, W82GO007.

In addition to these challenges, at the organisational level, stakeholders reported that implementation was hampered due to insufficient resources (i.e. staff and time) and training. It was reported that two other proposed areas withdrew from the pilot programme because of the lack of staff and leadership on the ground to run the programme. Stakeholders felt that they had very different resource issues to the hospital-based teams who are *"within the confines of a hospital… so they would or should have the same vision or focus... whereas we can see now with a community based programme the professionals can be very different in their training, they can have a different ethos in the departments within their community. It's very individual. We have different line managers and different resources to deal with"*, W82GO011. Some stakeholders *"didn't want to get involved because of existing workloads"*, and the lack of extra resources or allocated time to implement the pilot. Furthermore, while acknowledging the little time hospital staff had to develop community-specific training, local-level stakeholders felt they needed more *"practical and tailored"* information. Many described the training they received as *'too general'* and stated that *"it would have been very helpful to have had more practical tips on how to actually run the programme session to session with this age group"*, W82GO012.

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External Environment

In the Grol and Wensing model, the 'economic and political context' refers to financial arrangements, regulations and policies - themes which did not emerge during our research. Therefore, the sixth level was renamed 'external environment' to include wider societal perspectives and determinants.

In terms of the external environment, the lack of existing services to treat and manage childhood obesity meant many stakeholders were excited to come on board and implement this new initiative. One stakeholder described *"waiting for years for something to happen in this area",* W82GO005. The media was recognised as both a barrier and a facilitator to programme implementation. While stakeholders believed TV and radio campaigns have the potential to raise awareness they felt that the issue is *"also getting very bad press"* and being *"hyped up a little bit"* which in itself may make it more difficult for parents to come forward. Additionally, staff felt that the stigma surrounding childhood obesity and weight management programmes created a significant barrier to programme implementation as they believed many parents were reluctant to attend or even talk about the issue of weight for fear of singling out or *'labelling'* their child.

Vision for the future

In terms of the future scale up of *W82GO-community*, the majority of stakeholders recommend establishing dedicated childhood obesity teams within the community, *"ideally people who are located at least in the same town",* who can offer a range of interventions for different levels of need. One stakeholder described *"a tiered effect, for example there could be a level one which could be a generic workshop or talk that you could roll-out in lots of schools. A level two then would be a seminar for parents and level three would be a group programme. Level four then could be actual specific one on one interventions".* Having a tiered approach would enable the team to match the level of need with the family and allow families to choose where on the scale they would best fit.

DISCUSSION

This study identifies the barriers and facilitators to implementing a community-based weight management programme from the perspective of stakeholders tasked with delivering such a programme. While community-based weight management programmes have become an important response to the obesity epidemic given their potential reach and accessibility for families, the majority are based on small, efficacy trials [2] and little is

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known about the factors influencing their implementation in real-world settings. Our findings suggest that more consideration is needed during the planning stages, including the creation of a structured programme plan outlining specific roles and responsibilities. Local-level stakeholders believe they should be involved in this process as they have practical experience of working with families on the ground in their respective communities. In addition to their experience, the stakeholders we interviewed are keen to get involved in community-based weight management treatment provided the appropriate training and resources have been allocated. Within their 10 year framework for action, the Irish Government recognise the need for additional resources to be assigned and seek to *"mobilise the health services to better prevent and address overweight and obesity through effective community-based health promotion programmes"*[19] as well as providing training and skills development. Given this renewed commitment by the Irish Department of Health to empower community teams and communities, the road ahead looks promising.

A key barrier to the implementation of *W82GO-community* was perceived parental resistance which occurred at the patient level but is also intrinsically linked to the external environment where the increasing normalisation of overweight and obesity coexists with a stigma that surrounds the issue. Stakeholders delivering the programme described parental resistance occurring at every stage of the implementation process and suggested that parents did not appear to recognise the issue in their own children. As a result stakeholders believed that parents did not see the need for treatment or refused to accept that their child was carrying excess weight. While parental attitudes reported in this study were based on the perceptions of staff, a lack of parental awareness regarding their child's weight and resistance towards discussing weight issues has been documented in previous research [20-24]. This may be due in part to the belief that obesity has become the norm in society, a point which was suggested by stakeholders in this study, and previously outlined in the literature [25]. It is also possible that parental resistance stems from the stigma that is associated with excess weight and obesity [8, 21-23] or the negative media attention obesity has received. The framing of coverage by media may affect people's views about the causes of childhood obesity and the most appropriate strategies for addressing the problem [26]. Our findings highlight the need, at a policy level, for positive awareness-raising campaigns to encourage parental recognition of healthy childhood growth and development, in addition to knowledge regarding the importance of identifying obesity early in childhood.

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Low perceived self-efficacy in approaching the subject of weight with parents was a barrier facing staff during implementation. Stakeholders in this study see the need for a childhood weight management programme in their communities and acknowledge their professional responsibility to get involved. However, they appear uncomfortable and unequipped to do this. This is consistent with previous research which found that low perceived skills and low perceived self-efficacy hamper the implementation of such programmes [20, 27-30]. In our study motivational interviewing workshops equipped stakeholders in Site A with increased skills and confidence in working with families on weight management issues. Motivational interviewing is a goal-orientated, patient-centred approach based on the use of communication skills to understand individuals' motivation for behaviour change [31] and has been found to be useful when applied in health care settings [32]. We therefore consider it important that healthcare professionals involved in the implementation of obesity programmes receive this training prior to programme commencement.

The multidisciplinary structure of the programme emerged as both a barrier to and facilitator of implementation and spread across many of the levels outlined by Grol and Wensing. While acknowledged that it was required to treat such a complex health issue, it resulted in lack of role clarity, a lack of understanding of specific discipline roles, and led to difficulties in scheduling. This may in part be due to the structure and governance of community health services within Ireland. While there is a vision for multidisciplinary working set out in multiple policy documents and an emphasis on integrated care [33], the system is not set-up to support the concept. Stakeholders believe a simple roundtable introduction whereby practitioners could share their professional background and outline their specific role within the project would have helped overcome this ambiguity. They suggest it is a simple but often overlooked detail. Furthermore, stakeholders feel the establishment of a local lead was critical in assisting multidisciplinary working while also facilitating discussion between national and local level. Laws et al. also highlight the importance of having key local individuals responsible for driving and coordinating research translation [34].

Finally, an important finding from this research was the inherent problems in a *'one size fits all'* approach to community-based treatment. Stakeholders in our study suggest a tiered approach may be more suitable, beginning with a brief intervention which intensifies based on a child's degree of obesity, the family's motivation, and the capacity of the community and/or healthcare provider. This finding is in line with a suggestion from Staniford et al. who suggest that future interventions should tailor treatment according to

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participants' age, degree of obesity and their readiness or confidence to change [35]. In addition to tailoring a programme to the individual, programmes need to be adapted for the community setting. Stakeholders in our study raised concerns that the W82GO programme, having been developed in a hospital setting, was too medicalised for community practice. In particular, the lengthy assessment process which in some cases involved blood tests and the presence of medically trained doctors, was unnecessary for a community-based lifestyle programme. This finding is consistent with previous research conducted by Watson et al. who evaluated a family-based childhood obesity treatment intervention and found they needed to modify the assessment process by replacing community pediatrician assessments with parent/carer self-completion forms for reasons of time and cost [36]. To develop a full picture of treatment, future research should examine what aspects of the programme work, for whom, in what context and why.

While this study provides important insight into the implementation of childhood obesity programme in the community, several limitations should be acknowledged. According to de Casterlé *et al.*, (2012) *"using a preconceived framework runs the risk of prematurely excluding alternative ways of organising the data"*[37]pg.362. However, data was analysed inductively first before mapping emergent themes onto the Grol and Wensing Framework. In subsequent phases of analysis we adapted the framework to capture the influence of the external environment on implementation. Social desirability bias is a risk when stakeholders are known to the researcher conducting the interviews. In this case the stakeholders knew the researcher as the programme evaluator. However, we do not believe this bias had an effect as stakeholders were keen to *"tell their story".* It is also important to note that parental attitudes reported in this study were based on the perceptions of staff delivering the programme. Other studies have identified differences between parents, staff and children in terms of their attitudes towards childhood obesity treatment [35]. We are conducting further research with parents and children to understand the factors influencing their decisions to engage or disengage with obesity treatment.

CONCLUSION

In light of the dearth of knowledge available on the translation of multi-component childhood weight management programmes to community settings, this study highlights the barriers and facilitators to implementing such programmes from a wide range of community healthcare and admin perspectives. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training

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and resources, and organisational support play pivotal roles in overcoming barriers to change. Furthermore, our findings on the challenges of multidisciplinary working and translating hospital programmes to community settings are applicable to the implementation of interventions beyond that of childhood weight management. This evidence should be used to develop implementation plans to improve the translation of interventions into real world settings.

STATEMENTS:

- Authors' contributions

The authors responsibilities were as follows: EK: was responsible for the design and conduct of the research, and writing of the manuscript. SMH: was involved in data analysis and reviewed drafts of the manuscript. EK, SMH, JH, FS and IJP made critical revisions to the paper and gave final approval of the version to be submitted.

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- Competing interests

The authors declare that they have no competing interests

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- Data Sharing

Topic guides which were used in the interviews are available as additional supporting files. However, signed confidentiality agreements prevent us from sharing transcripts.

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- Ethics approval

Ethical Approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

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Supplementary Material 1: Completed TIDieR checklist

The TIDieR (Template for Intervention Description and Replication) Checklist

TIDieR
Template for Intervention
Description and Replication

Information to include when describing an intervention and the location of the information

Item number	Item	
	BRIEF NAME	
1.	Provide the name or a phrase that describes the intervention.	*'W82GO-community'* – a multi-component, family-focused childhood weight management pilot programme delivered in the community setting.
	WHY	
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.	The *W82GO-community* programme is a family-focused programme grounded in behavioural change theory (transtheoretical model and social cognitive theory) and aims to reduce obesity in children with BMI ≥98th percentile, improve children's dietary intake, physical activity levels and weight status while also increasing children's quality of life and psychosocial health. Using the social cognitive theory the programmes aims to motivate children and their families to engage in positive behaviours that are achievable. The transtheoretical model is incorporated from initial contact, when the service is first introduced to the family and their level of interest is assessed.
	WHAT	
3.	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide	The *W82GO-community* programme includes: (1) The *W82GO-community* pilot programme was delivered by a multi-disciplinary team using a manual developed to support community-based healthcare professionals to deliver the programme in their

information on where the materials can be accessed (e.g. online appendix, URL).

area. It does so through the provision of a guide to setting up a team and preparing the delivery of the programme; a framework for individual sessions that allows for session preparation and planning including programme presentations on disc; materials, including template letters and evaluation forms that can be adapted to suit the local context and information on additional resources that are available to support the team

(2) W82GO leaflet outlining the programmes goals and core elements to be distributed to families during recruitment

(3) W82GO family information booklet including goal setting and additional resources and tips were distributed to all families attending the programme

4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	Recruitment: heights and weights were measured in school by public health nurses (PHNs) using standardised procedures. Weight and height data was subsequently used to calculate body mass index (BMI) and children were classified as obese if their BMI plotted ≥98th BMI percentile for age and gender using the UK90 recommended cut-off points for treatment or referral which are currently used in Irish practice. Parents of children meeting this eligibility criterion were contacted by their school PHN to inform them of their child's weight status and those who indicated an interest in attending the programme were subsequently invited to attend an initial screening assessment.

This individualised initial assessment assessed eligibility before programme commencement. This assessment was carried out by a multidisciplinary team |

to rule out underlying medical conditions. In addition, indicators of health

literacy, health beliefs and physical and environmental variables that might act

as barriers to change were recorded.

Following the initial assessment, six group sessions took places over six weeks

and group booster sessions occurred at three, six and nine months. During

these group sessions parents and their children received an educational

session for the first hour. Children were taken out to complete physical

activity for the last 30 minutes while parents received an extra educational

session. At 12 months another individualised final assessment took place to

document any changes and make plans for sustainment.

WHO PROVIDED

5. For each category of intervention provider (e.g. psychologist, nursing
assistant), describe their expertise, background and any specific training
given.

The W82GO community-programme was delivered by a multidisciplinary team

of community health professionals including dietitians, physiotherapists, public

health nurses, psychologists, health promotion officers, area medical officers,

administrators and local area management. These health professionals had

varying levels of experience of dealing with childhood obesity and as a result

were invited to take part in a training programme prior to programme

commencement. Training included a needs assessment, a one day educational

training course and two days of clinical shadowing with an experienced *W82GO*

programme practitioner at Temple Street Children's University Hospital in

Dublin, Ireland. Each community practitioner was also supplied with a user

manual which outlined the programme and detailed the content for both

phases.

Public health nurses in one of the sites received motivational interviewing training specific to childhood obesity as part of routine training in the area already being conducted in that area.

HOW

6. Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.

The W82GO-community programme involved face-to-face sessions and included a mixture of group and individualised sessions as outlined above.

WHERE

7. Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.

Initial assessments took place in community healthcare offices. Subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre.

WHEN and HOW MUCH

8. Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.

The programme was run in two sites (Site A and Site B) over 12 months. The individual assessment lasted approximately one and half to two hours. The initial intensive phase consisted of 6 weekly group sessions for both the child and his/her parent/carer and these occurred over one afternoon a week and lasted approximately one and a half to two hours. The three booster sessions at three, six and nine months lasted approximately one to one and a half hours. During these group sessions parents and their children received an educational session for the first hour. Children were taken out to complete physical activity for the last 30 minutes while parents received an extra educational session. Upon completion of the 12 month programme children and their parents/carer return for a final assessment lasting approx. one and half to two hours. This

model of implementation is in keeping with the transtheoretical model of behaviour change.

TAILORING

9. If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.

All families received the same intervention.

MODIFICATIONS

10.‡ If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).

Two sites delivered the pilot programme to their respective communities. Site A decided to separate children and parents from the start of the group sessions because they felt children of this age would not gain anything nor were likely to understand the educational sessions. Children received a full physical activity session instead while parents received the educational session alone.

Owing to low numbers attending the programme in Site B programme staff chose not to go ahead with the final assessment at 12 months and instead conducted the final assessments during the third booster session.

HOW WELL

11. Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.

Fidelity of intervention delivery was assessed using trainer self-reports and exit interviews.

12.‡ Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.

In Site A, the programme was delivered in a more interactive manner (i.e. without the use of programme slides). Site B followed the manuals as planned.

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not   sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol   or other published
   papers (provide citation details) or a website (provide the URL).

‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348:g1687) which contains an explanation and elaboration for each item.

* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).

COREQ Checklist for Qualitative Research:

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Pg. 6
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Pg. 1, 6 & 7
3. Occupation	What was their occupation at the time of the study?	Pg. 1, 6
4. Gender	Was the researcher male or female?	Pg. 1,6
5. Experience and training	What experience or training did the researcher have?	Pg. 6
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Pg. 3
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Pg. 15
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Pg. 1,3,6
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Pg. 6-7
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Pg. 6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Pg. 6
12. Sample size	How many participants were in the study?	Pg. 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Pg. 7
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Pg. 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	NA
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Pg. 7
Data collection		

17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Pg. 6
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	NA
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Pg. 6
20. Field notes	Were field notes made during and/or after the interview or focus group?	Yes
21. Duration	What was the duration of the interviews or focus group?	Pg. 6
22. Data saturation	Was data saturation discussed?	Pg. 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Pg. 7
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Pg. 7
27. Software	What software, if applicable, was used to manage the data?	Pg. 7
28. Participant checking	Did participants provide feedback on the findings?	NA
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Pg. 8-13
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Pg. 8-13
31. Clarity of major themes	Were major themes clearly presented in the findings?	Pg. 8-13
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes Pg. 8-13

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Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme in Ireland: A qualitative study

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Title:

Barriers and facilitators to the implementation of a community-based, multidisciplinary, family-focused childhood weight management programme in Ireland: A qualitative study

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ABSTRACT:

Objective: To explore the barriers and facilitators experienced by those implementing a government-funded, community-based, childhood weight management programme.

Design: Qualitative using semi-structured interviews.

Setting: Two geographical regions in the south and west of the Republic of Ireland.

Participants: 29 national and local level stakeholders responsible for implementing the programme including professionals from dietetics, psychology, public health nursing, physiotherapy, health promotion and administration.

Methods: Framework analysis was used to identify barriers and facilitators which were mapped onto six levels of factors influencing implementation outlined by Grol and Wensing: the innovation, the individual professional, the patient, the social context, the organisational context, and the external environment.

Results: Most barriers occurred at the level of the organisational context. For all stakeholders, barriers arose due to the multidisciplinary nature of the programme, including the lack of role clarity and added complexity of working in different locations. Health professionals' low-perceived self-efficacy in approaching the subject of weight with parents and parental resistance to hearing about their child's weight status were barriers to programme implementation at the individual professional and patient levels, respectively. The main facilitators of implementation, occurring at the level of the health professional, included stakeholders' recognition of the need for a weight management programme and personal interest in the area of childhood obesity. Having a local lead and supportive colleagues were further implementation drivers.

Conclusions: This study highlights the complexities associated with implementing a multidisciplinary childhood weight management programme, particularly translating such programmes to a community setting. Our results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training and resources, and organisational support play pivotal roles in overcoming barriers to change. This evidence can be used to develop an implementation plan to support the translation of interventions into real world settings.

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ARTICLE SUMMARY

Strengths and limitations

- This is one of few qualitative studies, and the first in Ireland, that explored the factors that hampered and facilitated the implementation of a community-based, multi-component childhood weight management programme from a wide range of stakeholder perspectives.

- While interviewing a wide range of stakeholders provided a thorough overview of the relevant issues, the themes that emerged were relatively homogenous across disciplines which added to the authority of the findings.

- Data were analysed using a systematic approach and an adapted version of the implementation model by Grol and Wensing was used to classify the barriers and facilitators into levels.

- Using a preconceived framework runs the risk of prematurely excluding other ways of organising the data. However, data was analysed inductively first before mapping onto the Grol and Wensing Framework.

BACKGROUND:

Childhood obesity is a worldwide public health concern and there is now widespread agreement that the complex aetiology of the issue requires a multifaceted approach to treatment [1-3]. International recommendations agree that initiatives to reduce and manage childhood obesity should be family-focused and combine healthy eating, physical activity and behavioural components [2, 4, 5]. In 2016, the World Health Organisation published their report of the commission on ending childhood obesity within which they echo these recommendations but also add that they should be delivered by "*multi-professional teams with appropriate training and resources*" [5]pg.11. These recommendations, however, have been largely based on small-scale studies conducted in controlled settings with specialised staff, thus limiting their applicability and generalizability to 'real-world' settings such as communities or hospitals [2].

In public health, once interventions have undergone innovation testing and demonstrated efficacy the next steps include replication and 'scale-up' to larger populations in 'real-world' settings [6]. There are relatively few examples of published studies reporting on the pragmatic application of effective childhood obesity treatment programmes [7, 8]. While implementation issues such as engagement, local context, staffing and funding are likely to be common across many public health interventions [8], little is documented about the experience of those implementing childhood weight management programmes and even fewer studies detail the factors influencing implementation [9]. For example, a lack of providers trained in evidence-based care for childhood obesity was listed by delegates attending a recent conference in the United States as a major barrier to treatment implementation [3]. Furthermore, with the majority of families declining referral and up to 75% of families discontinuing care, poor engagement with families has proven to be a significant challenge facing teams tasked with implementing such programmes [10, 11].

When introduced under less-controlled conditions, insight into the factors influencing implementation is crucial. Therefore, the aim of this study was to explore and categorise the barriers and facilitators experienced by those implementing a government-funded, community-based, multi-component childhood weight management pilot programme to inform their eventual scale up.

METHODS:

Intervention and context

Although trends appear to be stabilising in Ireland, prevalence of childhood obesity remains high [12]. Currently, in Ireland, almost one in four children are either overweight or obese [13] and there is no standardised community-based weight management programme available to those children with obesity. Community programmes are usually provided on an ad-hoc basis and are rarely evaluated or sustained. In an attempt to identify a universal treatment the Irish Health Service Executive (HSE) planned to pilot the *W82GO-community* programme in two communities. This programme had previously demonstrated effectiveness in the hospital setting [14]. Its effectiveness in the community setting was to be assessed with the intention of nationwide rollout should the programme demonstrate a positive impact on body mass index (BMI). The Template for Intervention Description and Replication (TIDieR) checklist [15] was used to specify the details of programme delivery and is included in Supplementary file 1.

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In summary, *W82GO* aims to improve nutrition, increase physical activity and facilitate behaviour change over one year [14]. It was designed as a hospital-based, family-focused, multidisciplinary programme grounded in behavioural change theory and was modelled on best practice recommendations [2, 5, 16]. The primary goal was a reduction in Body Mass Index Standard Deviation Score and has previously been found to be effective when delivered in a hospital out-patient setting [14].

The *W82GO* programme involves an initial individual assessment to ascertain family eligibility followed by two phases. Families were eligible for the programme if the child was between 5-7 years old; was obese (BMI ≥98th centile); had no limitations to engaging in physical activity; was not taking medication known to affect body weight; and had at least one parent/carer who was able to attend each of the programme sessions. Siblings were also welcome to attend the sessions. Phase 1 involved an initial intensive phase consisting of six weekly group sessions for both the child and his/her parent/carer. These sessions lasted approximately one and a half to two hours and incorporated educational and practical sessions to increase physical activity, improve nutrition and increase sleep. Upon completion of phase 1, children returned with their parents/care-givers for three booster group sessions at three, six and nine months. These sessions aimed to encourage the family to continue with lifestyle change and to manage any barriers to change. Finally, at 12 months, the children and their parents/care-givers returned for a final individual assessment to document any changes and make plans for sustainment.

For the current study, *W82GO* was adapted and implemented in two community sites (Site A and Site B) from April 2015 for 12 months and subsequently renamed *W82GO-community*. Both sites were chosen as they were part of a national pilot growth measurement programme and included a mix of rural and urban towns in the west and south of Ireland. Initial assessments took place in community healthcare offices while subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre. The programme was offered free of charge and was delivered by existing community health professionals including dietitians, psychologists, public health nurses, physiotherapists, health promotion officers, area medical officers and administrators. These health professionals were brought together as a team and asked to deliver this programme as part of their existing roles. Table 1 outlines their specific responsibilities during programme implementation. All staff were invited to take part in a training programme prior to programme commencement. Training included a needs assessment, a one day educational training course and two days of

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clinical shadowing with an experienced *W82GO* programme practitioner at the National Children's University Hospital where it was developed. Each community practitioner was supplied with a user manual which outlined the programme and detailed the content for both phases.

Table 1 Health professional roles during the implementation of W82GO-community

Health Professional	Role in implementation of *W82GO-community*
National Manager (n=1)	Overseeing implementation of W82GO-community in both community sites
Local Manager (n=2)	Overseeing implementation of W82GO-community at local level. Local manager in Site B was involved in referring to the programme.
Physiotherapists (n=4)	Involved in initial assessments and delivering programme material
Dietitians (n=5)	Involved in initial assessments and delivering programme material
Psychologists (n=3)	Involved in initial assessments and delivering programme material
Public Health Nurses (n=13)	Referral to the programme
Area Medical Officers (n=4)	Involved in initial assessments
Health Promotion Officers (n=4)	Delivering programme material
Administration (n=2)	Involved in contacting parents re programme sessions

Study design and sample

A qualitative approach using semi-structured interviews was utilised. We adopted a purposive approach to sampling, inviting stakeholders with knowledge and experience of planning, coordinating or delivering *W82GO-community.* To ensure representation from each stakeholder group and given the small number of individuals in each, we invited all stakeholders to participate (n=38, see table 1). All stakeholders were contacted by email in the first instance and followed up by telephone contact during which the researcher outlined the study aims and methodology.

Data collection

All participants were invited to take part in face-to-face interviews. However, due to time and scheduling difficulties a mixture of telephone and face-to-face interviews were conducted between August 2015 and February 2016 (during programme implementation). To ensure consistency all interviews were conducted by a single trained qualitative researcher (EK), using a semi structured topic guide. Participants knew the interviewer as an independent programme evaluator conducting this research as part of her PhD training. The topic guide was developed based on relevant literature and focused on seven issues: (1) awareness of the

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issue of childhood obesity and existing healthy lifestyle programmes, (2) perceived value of and interest in community evidence-based treatment programmes, (3) communication of the *W82GO-community* pilot programme; (4) specific role in implementing *W82GO-community*; (5) barriers and enablers to implementation; (6) perceived successes and challenges experienced and finally (7) recommendations for the future roll-out of childhood weight management programmes in Irish communities. Core topics were the same across stakeholders and particular probes were added for specific stakeholder groups depending on their role during the programme. For example public health nurses were specifically asked to report on the barriers and facilitators to referral. Prompts and probes were used throughout the interviews to stimulate discussion. Prior to each interview, participants were informed about the purpose of the study, that participation was voluntary and that they could terminate the interview at any stage for any reason. Signed informed consent was obtained before each interview, which lasted on average 45 minutes. Interviews were digitally recorded and transcribed verbatim. Data collection and analysis was iterative. Data saturation was judged to have been reached between interviews 20 and 25. However during recruitment, other stakeholders had expressed an interest in sharing their experience and so were given the opportunity to participate. The data from these interviews overlapped with the existing coding framework and thus contributed to the main themes. Ethical approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

Data Analysis

Framework analysis was used to analyse the data [17]. This approach enabled the investigation of a priori objectives while also allowing new themes to emerge from the data. One researcher (EK) transcribed and coded each transcript while another (SMH) undertook initial coding of a selection of transcripts. Similarities and differences between the coding labels and definitions were discussed and the coding framework was refined and applied to the remaining interviews. While this process was conducted at an early stage of the analysis, the coding process was iterative; emergent codes were added to the framework and contributed to the development of themes across the interviews. Codes were synthesised and grouped according to the dominant emergent themes. Themes were also analysed across stakeholder groups to identify similarities and differences across disciplines and positions. These themes were mapped onto a framework developed by Grol and Wensing (2004) which specifies six levels of factors that facilitate or impede implementation success: the innovation; the individual professional, the patient; the social context; the organisational context; and the

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economic and political environment [18]. Mapping emergent themes to the framework at this stage of the analysis ensured that we did not impose a predefined structure or terminology on participants' accounts. This well-established framework (Table 2) was chosen because it describes how barriers and facilitators can be identified, categorised, and used for the development of tailor-based implementation strategies to facilitate desired change [18], in this instance implementing the *W82GO-community* programme. Discrepancies on the mapping of themes were discussed until consensus was reached. NVivo (QSR v10) was used to manage data analysis.

Table 2 Barriers to and incentives for change at different levels of healthcare[a]

Level	Barriers / Incentives
Innovation	Advantages in practice, feasibility, credibility, attractiveness, accessibility
Individual Practitioner	Awareness, knowledge, attitude, motivation to change, behavioural routines
Patient	Knowledge, skills, attitude, compliance
Social Context	Opinion of colleagues, culture of the network, collaboration, leadership
Organisational Context	Organisation of care processes, staff, capacities, resources, structures
Economic and Political Context	Financial arrangements, regulations, policies

[a]*Grol and Wensing's multilevel model[18]*

RESULTS

Participant characteristics

We contacted 38 stakeholders and recruited 29 interviewees (7 face-to-face, 22 telephone) from a range of disciplines and professions, yielding a response rate of 76% (Table 3).

Table 3 Stakeholders recruited from Site A and Site B

	Site A	Site B	National	Total
National Manager	NA	NA	1	1
Local Manager	1	1	x	2
Physiotherapists	2	1	1	4
Dietitians	3	x	x	3
Psychologists	1	1	x	2
Public Health Nurses	6	3	x	9
Area Medical Officers	x	2	x	2
Health Promotion Officers	3	1	x	4
Administration	1	x	1	2
Total	17	9	3	29

Barriers and Facilitators

For all participants, barriers arose due to the multidisciplinary nature of the programme, including the lack of understanding of other disciplines, lack of role clarity as well as the added complexities of working in different locations. Participants' recognition of the need for a childhood obesity programme and their own personal interest in the area were the main drivers of implementation while the presence of a local lead and supportive colleagues were further enabling factors. Views on the main barriers and facilitators to implementation were consistent across stakeholders; despite different disciplinary backgrounds, they had common experiences as implementers adding to the authority of the findings. Table 4 presents the perceived barriers and facilitators from the perspective of the stakeholders mapped onto the six implementation levels with quotations to illustrate each level.

Table 4 Perceived Barriers and Facilitators to the Implementation of W82GO in the Community

Levels	Quotations to illustrate the identified levels
The Innovation	
Credibility	(+) *"I suppose because it was attached to an acute hospital and because there was a consultant paediatrician and you had a lot of disciplines and a lot of very competent professionals involved, and that it had been successful when delivered there. That was the main reason I believed in the programme I suppose"*, W82GO003
Attractiveness (i.e. Multidisciplinary nature)	(+) *"I do think the MDT approach was superb. I think that is you're going to do something for a child who is obese then you need it."* W82GO018
Transferability (i.e. different population, different resource issues)	(-) *"You are talking about a different cohort of families. Families who are already in the system. They are used to going in for appointments. You're talking about a group who've already had difficulties identified by their GP or whoever so by the time they are going for the group they are already sold, they are used to it and they are used to that sort of setting which is very kind of fast and quick-paced and very focused"*, W82GO002
Relevance (e.g. too medicalised)	(-) *"I think the area medical officer, the medical input I think is probably optional or at least part-time. It's of less importance. It medicalised this community programme a bit too much"*, W82GO021
The Individual Professional	
Awareness of the problem / Recognition of need	(+) *"It is a problem, most definitely. I think it's a time bomb that went off over the past 10 years and that we are behind it. Way behind it and the sooner we get going and get doing something the better"*, W82GO013
Personal interest and motivation	(+) *"So that enthusiasm and that dedication made it happen, it was key to its success"*, W82GO011
Low self-efficacy	(-) *"I wouldn't be especially skilled in assessing children you know with obesity and that kind of thing... Or talking to parents about it... I was concerned about my own ability to, to get up to speed fairly quickly"*, W82GO015

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Attitudes (i.e. Multidisciplinary perspectives)	(-) *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenges of it is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives"*, W82GO026
The Patient	
Parental Resistance (weight misperception and denial)	(-) *"I think there was a denial that there was anything wrong with their child, or that their child was overweight. There was a total denial about that because the population in general look like their child. Their child may be a little bit above of what the normal population looks like, but they didn't see that as an issue at all"*, W82GO028
The Social Context	
Supportive colleagues	(+)*"Once she came on board there was two of us, it was a lot easier to share the workload and if I couldn't be there for a day she could be there for it so I suppose that definitely took the load off and she also acted as a sounding board you know? If there was something I wasn't sure of I could say what do you think about this and vice-versa, you know what I mean?"*, W82GO016
Leadership	(+) *"I mean if we didn't have her pulling all those people and bits together it wouldn't have worked. She did a great job in I think the co-ordination role cause I think running something like this with people dispersed across a whole county and city then you need a project manager on the ground."*, W82GO017
Collaboration between national and local teams	(-) *"I did feel there was a very big gap once the decision had been made nationally to roll this out, there was a very big gap between us on the ground and them, there was no consultation or collaboration with people on the ground and I think that's where the problem was"*, W82GO003
The Organisational Context	
MDT Structure (logistics)	(-) *"I suppose one of the challenges definitely is that the health professionals are all in different places"*, W82GO004
Resources	(-) *"I guess time constraints 'cause a lot of people were pressurised for time. Like even ourselves we wouldn't have been able to go to every session and I would have liked to have gone but we just couldn't. We didn't have the time. We didn't have the staff to be able to attend so i think time and resource pressures were the main concerns"*, W82GO013
Training	(-) *"It (the training) was as if they were trying to sell us the programme when you know we were already there. We were already sold. I mean we knew why it was important... because of the obesity issue so there was no need to go over all that again. They should have just focused on how to actually implement and deliver the programme"*, W82GO011
External Environment	
Lack of existing services	(+) *"There is nothing out there so that's where it was great to have something like W82GO. That if you did see a child that you know there was something. Some sort of pathway"*
Media	(+) *"There was a huge media campaign ongoing around the time we were implementing the programme which got some parents thinking and talking. I mean those things do have a big impact. Things like Operation Transformation that's aired in January have a huge impact. I think we need more media on the impact of childhood obesity and not just the long-term impacts"*, W82GO003
	(-) *"I think maybe it's (obesity) hyped up a little bit in the media. I think maybe that in itself could be making things difficult for parents to come forward. We don't have any other disease related issue hyped up as much you know? If you had a child with obesity you would be feeling a small bit cringe like. You'd be wanting to find somewhere private to get some help like you know"*, W82GO020
Stigma	(-) *"Wouldn't have their child come to a programme in case they'd be labelled overweight or obese. There is a stigma and just from hearing again I wasn't in the parents room, but just from hearing other colleagues feedback it's the parents fear of feeling judged and*

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*blamed",*W82GO002

(+) Facilitators, (-) Barriers.

The Innovation

In terms of the *W82GO-community* pilot programme (innovation), while stakeholders believed it came from a credible source having been developed by one of the national children's hospitals in Ireland, many had doubts over its accessibility and about how well it would transfer to the community setting. This uncertainty resulted in feelings of unease and community practitioners were hesitant to get involved initially. One stakeholder explained how she worried at length about what impact the programme would have on existing services and how feasible it was to run in the community; *"The setting is different. We were taking a programme that was from an acute setting into the community - that possibly was where the breakdown happened because you didn't have the same services. You didn't have people on site. There was travel, there was all these other logistics that weren't thought about when they were moving an acute programme to the community"*, W82GO021. In particular, stakeholders believed they were dealing with a very different cohort of families than the hospital-based programme as described by the following quote; *"You've a very different kind of child coming into the hospital than you do in the general community. You've a very different kind of parent. Even if you had a parent who was resistant to hearing about their child being overweight, if they are attending hospital appointments regularly they are obviously already engaged about their child's health... so I believe that's a major barrier straight away that they possibly didn't have to face in the hospital you know?"*, W82GO010.

In addition to the differences in the target group, stakeholders believed the programme was too medicalised for the community setting and some felt it did not fit with their perception of a healthy lifestyle programme. This was due to the number of health professionals involved and in particular, the involvement of medical staff. Furthermore, many stakeholders thought the collection of clinical markers of disease and medical history during the initial assessments was unnecessary. As one stakeholder described; *"the initial assessments were totally irrelevant. I mean when I heard that bloods were being taken I thought oh for God sake. You know we were supposed to be running a community-based education intervention where the focus should be on changing lifestyles. It's not our job to be diagnosing other problems",* W82GO005.

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Individual Professional

While stakeholders both applauded and recognised the need for a multidisciplinary approach to the treatment of childhood obesity, it created significant barriers to programme implementation. The variety of community health professionals involved in the implementation of *W82GO-community* with differing perspectives and priorities led to role uncertainty and in some cases a perception of disrespect between disciplines. One stakeholder captures this theme in the following quote; *"I suppose the other main challenge was the multidisciplinary nature of the programme. I think the challenge is when you put together a team obviously from all different backgrounds not with different agendas but with different experiences and knowledge and different perspectives",*W82GO026. Stakeholders described how *"there was quite a lack of understanding of the various discipline roles and responsibilities and some were even unsure of what some disciplines did",* W82GO012. This lack of understanding sometimes resulted in tension between disciplines and created a challenging environment to work in. Others recalled feeling concerned about where they fit into the programme and believed a structured programme plan outlining specific roles and responsibilities was lacking.

Another key barrier that emerged at the level of the individual professional was their low perceived self-efficacy in dealing with childhood obesity and/or working with this young age group. In particular, many stakeholders reported their fear of approaching the subject with parents given the risk of upsetting them or *"rocking the boat".* One stakeholder reported that *"it's something you want to do something about but it can be very difficult to approach the subject with parents. It's a very sensitive issue",* W82GO001. In our study, stakeholders in Site A received motivational interviewing workshops for childhood obesity. This training equipped these stakeholders with increased skills and confidence in working with families on weight management issues. As one stakeholder described, post motivational interviewing training she wasn't *"frightened of dealing with them [parents] at all", It's kind of second nature to me now... I know the buzz words, I know exactly what to say to them. And body language, the whole lot",* W82GO002. Others felt it was quite *"alien"* to work with children aged 5-6 years and believed they had not the appropriate training to do so.

Despite these barriers, all stakeholders were aware that childhood obesity was an issue in their respective communities and recognised the urgent need for treatment; *"Yeah I think it's a time bomb that went off over*

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the past ten years and that we are behind it, way behind and the sooner we get going and doing whatever we can the better", W82GO012. Furthermore, stakeholders' personal interest in tackling the issue, and their motivation and dedication to seeing the programme through were what many believed to be the main drivers behind programme completion; *"It went ahead due to a lot of determination and not because it was easily implementable... if that's a word",* W82GO014.

Patient

Low programme uptake was a key issue during implementation. Many stakeholders believe that obesity has become the norm in society and as a result *"people don't recognise overweight people as being in that actual overweight category because it's become normal to be surrounded by overweight people",* W82GO021. In terms of the *W82GO-community* pilot programme, almost all stakeholders indicated that although children measured as obese on the growth charts their parents seemed unaware of any excess weight and once informed, many refused to accept that their child was obese. As a result of this misperception parents did not realise or accept the need for treatment. Speaking of her experience, one stakeholder described how *"other parents just didn't reply or didn't get in touch because they believed everything was ok and there wasn't a problem with their child. They didn't need any programme. I think that definitely was a huge problem out there in the community setting",* W82GO012. Because of this low recognition amongst parents, many stakeholders recalled the resistance they faced when trying to discuss the issue with them and their fear prior to making contact with parents. One stakeholder explained how some parents would *"be really angry so you're taking angry phone calls in the evening. You know when you come in from a day's work so it was really difficult",* W82GO002.

Social Context

Local level stakeholders believed there was a certain level of *"naïvety"* at national level about the reality of rolling out the pilot programme on the ground. They felt consultation during the planning stage was lacking and that national-level stakeholders had *"little experience of the practical aspects of childhood obesity"* as *"no one was actually working with obese children or even groups on a day to day basis",* W82GO004. As a result unrealistic expectations and timeframes prevailed, particularly during the recruitment phase. This led to frustration and confusion among local-level health professionals during implementation.

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Communication between national and local level stakeholders was considered poor. However, the presence of a local lead facilitated the exchange between staff on the ground and management at national level and was seen by almost all stakeholders as crucial for programme implementation. Furthermore, stakeholders felt that because of the multidisciplinary approach of the programme *"you needed someone on the ground"*; if they did not have a local lead *"pulling all those people and bits together, it wouldn't have worked because running something like this with people dispersed across a whole county and city is difficult"*, W82GO005. The presence of supportive colleagues and management were identified as further enabling factors.

Organisational Context

The multidisciplinary structure of the programme also created barriers at the organisational level. In addition to differing individual perspectives and priorities, the added complexities of working in different locations created difficulties during programme implementation. In many cases stakeholders didn't *"work at the same site… or even the same town which was a challenge"* as it *"took up a lot of time organising between schedules and travelling to meet and go through practicalities"*, W82GO007.

In addition to these challenges, at the organisational level, stakeholders reported that implementation was hampered due to insufficient resources (i.e. staff and time) and training. It was reported that two other proposed areas withdrew from the pilot programme because of the lack of staff and leadership on the ground to run the programme. Stakeholders felt that they had very different resource issues to the hospital-based teams who are *"within the confines of a hospital… so they would or should have the same vision or focus... whereas we can see now with a community based programme the professionals can be very different in their training, they can have a different ethos in the departments within their community. It's very individual. We have different line managers and different resources to deal with"*, W82GO011. Some stakeholders *"didn't want to get involved because of existing workloads"*, and the lack of extra resources or allocated time to implement the pilot. Furthermore, while acknowledging the little time hospital staff had to develop community-specific training, local-level stakeholders felt they needed more *"practical and tailored"* information. Many described the training they received as *'too general'* and stated that *"it would have been very helpful to have had more practical tips on how to actually run the programme session to session with this age group"*, W82GO012.

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External Environment

In the Grol and Wensing model, the 'economic and political context' refers to financial arrangements, regulations and policies - themes which did not emerge during our research. Therefore, the sixth level was renamed 'external environment' to include wider societal perspectives and determinants.

In terms of the external environment, the lack of existing services to treat and manage childhood obesity meant many stakeholders were excited to come on board and implement this new initiative. One stakeholder described *"waiting for years for something to happen in this area",* W82GO005. The media was recognised as both a barrier and a facilitator to programme implementation. While stakeholders believed TV and radio campaigns have the potential to raise awareness they felt that the issue is *"also getting very bad press"* and being *"hyped up a little bit"* which in itself may make it more difficult for parents to come forward. Additionally, staff felt that the stigma surrounding childhood obesity and weight management programmes created a significant barrier to programme implementation as they believed many parents were reluctant to attend or even talk about the issue of weight for fear of singling out or *'labelling'* their child.

Vision for the future

In terms of the future scale up of *W82GO-community,* the majority of stakeholders recommend establishing dedicated childhood obesity teams within the community, *"ideally people who are located at least in the same town",* who can offer a range of interventions for different levels of need. One stakeholder described *"a tiered effect, for example there could be a level one which could be a generic workshop or talk that you could roll-out in lots of schools. A level two then would be a seminar for parents and level three would be a group programme. Level four then could be actual specific one on one interventions".* Having a tiered approach would enable the team to match the level of need with the family and allow families to choose where on the scale they would best fit.

DISCUSSION

This study identifies the barriers and facilitators to implementing a community-based weight management programme from the perspective of stakeholders tasked with delivering such a programme. While community-based weight management programmes have become an important response to the obesity epidemic given their potential reach and accessibility for families, the majority are based on small, efficacy trials [2] and little is

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known about the factors influencing their implementation in real-world settings. Our findings suggest that more consideration is needed during the planning stages, including the creation of a structured programme plan outlining specific roles and responsibilities. Local-level stakeholders believe they should be involved in this process as they have practical experience of working with families on the ground in their respective communities. In addition to their experience, the stakeholders we interviewed are keen to get involved in community-based weight management treatment provided the appropriate training and resources have been allocated. Within their 10 year framework for action, the Irish Government recognise the need for additional resources to be assigned and seek to *"mobilise the health services to better prevent and address overweight and obesity through effective community-based health promotion programmes"*[19] as well as providing training and skills development. Given this renewed commitment by the Irish Department of Health to empower community teams and communities, the road ahead looks promising.

A key barrier to the implementation of *W82GO-community* was perceived parental resistance which occurred at the patient level but is also intrinsically linked to the external environment where the increasing normalisation of overweight and obesity coexists with a stigma that surrounds the issue. Stakeholders delivering the programme described parental resistance occurring at every stage of the implementation process and suggested that parents did not appear to recognise the issue in their own children. As a result stakeholders believed that parents did not see the need for treatment or refused to accept that their child was carrying excess weight. While parental attitudes reported in this study were based on the perceptions of staff, a lack of parental awareness regarding their child's weight and resistance towards discussing weight issues has been documented in previous research [20-24]. This may be due in part to the belief that obesity has become the norm in society, a point which was suggested by stakeholders in this study, and previously outlined in the literature [25]. It is also possible that parental resistance stems from the stigma that is associated with excess weight and obesity [8, 21-23] or the negative media attention obesity has received. The framing of coverage by media may affect people's views about the causes of childhood obesity and the most appropriate strategies for addressing the problem [26]. Our findings highlight the need, at a policy level, for positive awareness-raising campaigns to encourage parental recognition of healthy childhood growth and development, in addition to knowledge regarding the importance of identifying obesity early in childhood.

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Low perceived self-efficacy in approaching the subject of weight with parents was a barrier facing staff during implementation. Stakeholders in this study see the need for a childhood weight management programme in their communities and acknowledge their professional responsibility to get involved. However, they appear uncomfortable and unequipped to do this. This is consistent with previous research which found that low perceived skills and low perceived self-efficacy hamper the implementation of such programmes [20, 27-30]. In our study motivational interviewing workshops equipped stakeholders in Site A with increased skills and confidence in working with families on weight management issues. Motivational interviewing is a goal-orientated, patient-centred approach based on the use of communication skills to understand individuals' motivation for behaviour change [31] and has been found to be useful when applied in health care settings [32]. We therefore consider it important that healthcare professionals involved in the implementation of obesity programmes receive this training prior to programme commencement.

The multidisciplinary structure of the programme emerged as both a barrier to and facilitator of implementation and spread across many of the levels outlined by Grol and Wensing. While acknowledged that it was required to treat such a complex health issue, it resulted in lack of role clarity, a lack of understanding of specific discipline roles, and led to difficulties in scheduling. This may in part be due to the structure and governance of community health services within Ireland. While there is a vision for multidisciplinary working set out in multiple policy documents and an emphasis on integrated care [33], the system is not set-up to support the concept. Stakeholders believe a simple roundtable introduction whereby practitioners could share their professional background and outline their specific role within the project would have helped overcome this ambiguity. They suggest it is a simple but often overlooked detail. Furthermore, stakeholders feel the establishment of a local lead was critical in assisting multidisciplinary working while also facilitating discussion between national and local level. Laws et al. also highlight the importance of having key local individuals responsible for driving and coordinating research translation [34].

Finally, an important finding from this research was the inherent problems in a *'one size fits all'* approach to community-based treatment. Stakeholders in our study suggest a tiered approach may be more suitable, beginning with a brief intervention which intensifies based on a child's degree of obesity, the family's motivation, and the capacity of the community and/or healthcare provider. This finding is in line with a suggestion from Staniford et al. who suggest that future interventions should tailor treatment according to

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participants' age, degree of obesity and their readiness or confidence to change [35]. In addition to tailoring a

programme to the individual, programmes need to be adapted for the community setting. Stakeholders in our

study raised concerns that the W82GO programme, having been developed in a hospital setting, was too

medicalised for community practice. In particular, the lengthy assessment process which in some cases

involved blood tests and the presence of medically trained doctors, was unnecessary for a community-based

lifestyle programme. This finding is consistent with previous research conducted by Watson et al. who

evaluated a family-based childhood obesity treatment intervention and found they needed to modify the

assessment process by replacing community pediatrician assessments with parent/carer self-completion forms

for reasons of time and cost [36]. To develop a full picture of treatment, future research should examine what

aspects of the programme work, for whom, in what context and why.

While this study provides important insight into the implementation of childhood obesity programme in the

community, several limitations should be acknowledged. According to de Casterlé *et al.*, (2012) *"using a*

preconceived framework runs the risk of prematurely excluding alternative ways of organising the

data"[37]pg.362. However, data was analysed inductively first before mapping emergent themes onto the Grol

and Wensing Framework. In subsequent phases of analysis we adapted the framework to capture the

influence of the external environment on implementation. Social desirability bias is a risk when stakeholders

are known to the researcher conducting the interviews. In this case the stakeholders knew the researcher as

the programme evaluator. However, we do not believe this bias had an effect as stakeholders were keen to

"tell their story". It is also important to note that parental attitudes reported in this study were based on the

perceptions of staff delivering the programme. Other studies have identified differences between parents,

staff and children in terms of their attitudes towards childhood obesity treatment [35]. We are conducting

further research with parents and children to understand the factors influencing their decisions to engage or

disengage with obesity treatment.

CONCLUSION

In light of the dearth of knowledge available on the translation of multi-component childhood weight

management programmes to community settings, this study highlights the barriers and facilitators to

implementing such programmes from a wide range of community healthcare and admin perspectives. Our

results suggest the assignment of clear roles and responsibilities, the provision of sufficient practical training

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and resources, and organisational support play pivotal roles in overcoming barriers to change. Furthermore, our findings on the challenges of multidisciplinary working and translating hospital programmes to community settings are applicable to the implementation of interventions beyond that of childhood weight management. This evidence should be used to develop implementation plans to improve the translation of interventions into real world settings.

STATEMENTS:

- Authors' contributions

The authors responsibilities were as follows: EK: was responsible for the design and conduct of the research, and writing of the manuscript. SMH: was involved in data analysis and reviewed drafts of the manuscript. EK, SMH, JH, FS and IJP made critical revisions to the paper and gave final approval of the version to be submitted.

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- Competing interests

The authors declare that they have no competing interests

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- Data Sharing

Topic guides which were used in the interviews are available as additional supporting files. However, signed confidentiality agreements prevent us from sharing transcripts.

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- Ethics approval

Ethical Approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

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Supplementary Material 1: Completed TIDieR checklist

The TIDieR (Template for Intervention Description and Replication) Checklist

T DieR
Template for Intervention
Description and Replication

Information to include when describing an intervention and the location of the information

Item number	Item		
	BRIEF NAME		
1.	Provide the name or a phrase that describes the intervention.		*'W82GO-community'* – a multi-component, family-focused childhood weight management pilot programme delivered in the community setting.
	WHY		
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.		The *W82GO-community* programme is a family-focused programme grounded in behavioural change theory (transtheoretical model and social cognitive theory) and aims to reduce obesity in children with BMI ≥98th percentile, improve children's dietary intake, physical activity levels and weight status while also increasing children's quality of life and psychosocial health. During initial assessments the families attitudes and behaviours related to health promotion are identified and specific and achievable goals are set. In attaining these goals, a number of sub-behaviours are promoted including self-efficacy, self-monitoring and self-management. At every stage of the process the team aims to empower the family to recognise and make the necessary changes to bring about positive lifestyle changes and motivate them to maintain these changes.

WHAT

3. Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).

The *W82GO-community* programme includes:

(1) The *W82GO-community* pilot programme was delivered by a multi-disciplinary team using a manual developed to support community-based healthcare professionals to deliver the programme in their area. It does so through the provision of a guide to setting up a team and preparing the delivery of the programme; a framework for individual sessions that allows for session preparation and planning including programme presentations on disc; materials, including template letters and evaluation forms that can be adapted to suit the local context and information on additional resources that are available to support the team

(2) W82GO leaflet outlining the programmes goals and core elements to be distributed to families during recruitment

(3) W82GO family information booklet including goal setting and additional resources and tips were distributed to all families attending the programme

4. Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.

Recruitment: heights and weights were measured in school by public health nurses (PHNs) using standardised procedures. Weight and height data was subsequently used to calculate body mass index (BMI) and children were classified as obese if their BMI plotted ≥98th BMI percentile for age and gender using the UK90 recommended cut-off points for treatment or referral which are currently used in Irish practice. Parents of children meeting this eligibility criterion were contacted by their school PHN to inform them of their child's weight status and those who indicated an interest in attending the

programme were subsequently invited to attend an initial screening assessment.

This individualised initial assessment assessed eligibility before programme commencement. This assessment was carried out by a multidisciplinary team to rule out underlying medical conditions. In addition, indicators of health literacy, health beliefs and physical and environmental variables that might act as barriers to change were recorded.

Following the initial assessment six group sessions took places over six weeks and group booster sessions occurred at three, six and nine months. During these group sessions parents and their children received an educational session for the first hour. Children were taken out to complete physical activity for the last 30 minutes while parents received an extra educational session. At 12 months another individualised final assessment took place to document any changes and make plans for sustainment.

WHO PROVIDED

5. For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.

The W82GO community-programme was delivered by a multidisciplinary team of community health professionals including dietitians, physiotherapists, public health nurses, psychologists, health promotion officers, area medical officers, administrators and local area management. These health professionals had varying levels of experience of dealing with childhood obesity and as a result were invited to take part in a training programme prior to programme commencement. Training included a needs assessment, a one day educational training course and two days of clinical shadowing with an experienced *W82GO* programme practitioner at Temple Street Children's University Hospital in

Dublin, Ireland. Each community practitioner was also supplied with a user manual which outlined the programme and detailed the content for both phases.

Public health nurses in one of the sites received motivational interviewing training specific to childhood obesity as part of routine training in the area already being conducted in that area.

HOW

6. Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.

The W82GO-community programme involved face-to-face sessions and included a mixture of group and individualised sessions as outlined above.

WHERE

7. Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.

Initial assessments took place in community healthcare offices. Subsequent group sessions were delivered on weekdays in the afternoon at a local sports or community centre.

WHEN and HOW MUCH

8. Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.

The programme was run in two sites (Site A and Site B) over 12 months. The individual assessment lasted approximately one and half to two hours. The initial intensive phase consisted of 6 weekly group sessions for both the child and his/her parent/carer and these occurred over one afternoon a week and lasted approximately one and a half to two hours. The three booster sessions at three, six and nine months lasted approximately one to one and a half hours. During these group sessions parents and their children received an educational session for the first hour. Children were taken out to complete physical activity

for the last 30 minutes while parents received an extra educational session. Upon completion of the 12 month programme children and their parents/carer return for a final assessment lasting approx. one and half to two hours. This model of implementation is in keeping with the transtheoretical model of behaviour change.

	TAILORING	
9.	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	All families received the same intervention.
	MODIFICATIONS	
10.‡	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	Two sites delivered the pilot programme to their respective communities. Site A decided to separate children and parents from the start of the group sessions because they felt children of this age would not gain anything nor were likely to understand the educational sessions. Children received a full physical activity session instead while parents received the educational session alone. Owing to low numbers attending the programme in Site B programme staff chose not to go ahead with the final assessment at 12 months and instead conducted the final assessment during the third booster session.
	HOW WELL	
11.	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	Fidelity of intervention delivery was assessed using trainer self-reports and exit interviews.
12.‡	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	In Site A, the programme was delivered in a more interactive manner (i.e. without the use of programme slides). Site B followed the manuals as planned.

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol   or other published papers (provide citation details) or a website (provide the URL).

‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348:g1687) which contains an explanation and elaboration for each item.

* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).

COREQ Checklist for Qualitative Research:

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Pg. 6
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Pg. 1, 6 & 7
3. Occupation	What was their occupation at the time of the study?	Pg. 1, 6
4. Gender	Was the researcher male or female?	Pg. 1,6
5. Experience and training	What experience or training did the researcher have?	Pg. 6
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Pg. 3
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Pg. 15
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Pg. 1,3,6
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Pg. 6-7
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Pg. 6
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Pg. 6
12. Sample size	How many participants were in the study?	Pg. 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Pg. 7
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Pg. 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	NA
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Pg. 7
Data collection		

17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Pg. 6
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	NA
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Pg. 6
20. Field notes	Were field notes made during and/or after the interview or focus group?	Yes
21. Duration	What was the duration of the interviews or focus group?	Pg. 6
22. Data saturation	Was data saturation discussed?	Pg. 6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Pg. 7
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Pg. 7
27. Software	What software, if applicable, was used to manage the data?	Pg. 7
28. Participant checking	Did participants provide feedback on the findings?	NA
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Pg. 8-13
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Pg. 8-13
31. Clarity of major themes	Were major themes clearly presented in the findings?	Pg. 8-13
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes Pg. 8-13