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Foreword

It has been reported that weaning can be both an enjoyable experience and a challenging transition for parents. This research seeks to provide insights into parents' actual experiences and perceptions. The findings will inform *safe*food on how best to help parents with weaning their infants, at both an informal and professional level.

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- Thanks to the members of the Galway City Early Years Health and Wellbeing multi-agency committee[2].

[1] www.cherishstudy.com

[2] http://www.galwayhealthycities.ie/uploadedfiles/FINAL-Galway-City-Early-Years-Health-and-Wellbeing-Plan.pdf

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1 Introduction

The first 2 years of life are considered a critical window for growth, development and prevention of diet-related disease including obesity (1, 2). The early years are also an opportunity to positively influence dietary preferences and habits in young children (3-5). The World Health Organization (WHO) (6) recommends exclusive breastfeeding for the first 6 months of life, whilst the European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) recommends that complementary foods (solids and liquids other than breast milk or infant formula) should not be introduced before 4 months but should not be delayed beyond 6 months (7). In both Northern Ireland (NI) (8) and the Republic of Ireland (ROI) (9), the national recommendations for both formula-fed and breastfed babies is that "complementary feeding" or "weaning" should take place around 6 months of age (26 weeks), and not before 17 weeks of age.

Many infants on the island of Ireland are not weaned in accordance with formal weaning recommendations (10). In the ROI, evidence suggests that 18% of infants are weaned to solid foods before 17 weeks (11) while in NI, 35% of parents are reported to give solids before 17 weeks of age (12). The early introduction of solids may be associated with increased risks of obesity (2, 13-15), allergy (16, 17), eczema (18) and enteritis (19) and also with the development of unhealthy eating behaviours (20). Evidence for the optimal timing for the introduction of specific individual foods is generally lacking, and recommendations vary between countries, reflecting cultural factors and food availability (21).

The determinants of early weaning include socioeconomic, social and individual factors which are related both to the mother and the infant (21). Young mothers, members of ethnic minorities, those less educated, those living in a deprived area and those in receipt of benefits are significantly more likely than their counterparts to have less knowledge of weaning guidance, which is itself associated with earlier weaning (22-24). As well as early weaning, parents from low-income backgrounds are more likely to introduce infants to inappropriate foods, such as confectionary and crisps, and to offer few fruits and vegetables (25). Infant factors include an individual infant's developmental readiness and the development of the infant's fine, gross and oral motor skills (26).

Parental experiences of moving their infant from a solely milk-based diet to introducing complementary foods or "weaning" has been widely explored. However, there is a gap in the published literature around identifying influences on practices for parents on the island of Ireland, and for socially disadvantaged parents, who are shown to be most at risk of non-adherence to

guidelines. To successfully reduce the gap in inequalities in infant health (27), the barriers and facilitators to following weaning guidance, especially among those who are disadvantaged, must be understood.

2 Aims

The overall aim of this study was to investigate parents' knowledge, attitudes and practices around weaning their infant to solid foods, with a focus on families who are at an economic or social disadvantage. The study objectives were to:

- Investigate the knowledge, attitudes and practices of parents with children between 3 months and 14 months of age in relation to weaning their children
- Gain insight into the key barriers and facilitators that parents face when (or if) they are following weaning guidelines with their own children
- Investigate the key sources of information and guidance that parents are using which are viewed as both practical and helpful
- Identify with parents the mechanisms through which support can be provided for families who are weaning their children
- Make recommendations on the ways in which guidelines which offer support for parents around weaning can be improved, based on the feedback from parents.

3 Methodology

Approach

This study consisted of a qualitative research design, using focus groups and vignettes - short stories about a hypothetical person - to collect data from parents in order to achieve the study aims. There were two separate study teams for NI and the ROI. All research tools were developed with input from relevant stakeholders including representatives from public health nursing, community dietetics, health promotion, researchers and parents.

Recruitment of parents

Purposive and snowball sampling was used. Purposive sampling is a technique where the researcher relies on their own judgment when choosing people to participate in the study based on characteristics of a population and the objective of the study. Snowball sampling is a technique where the researcher begins with a small sample of known individuals and expands the sample by asking those initial participants to identify others that should participate in the study - the sample starts small but "snowballs" into a larger sample through the course of the research. In the case of this research there was a focus on recruitment through community groups and organisations who were already engaged with the target population (that is, socially disadvantaged parents with infants aged 3-14 months (32)). Social media was used, and existing parenting groups on Facebook were targeted where possible.

Profile of participants

Quantitative data was collected from each participant, through a questionnaire created specifically for this study, predominantly using items and measures from previous surveys (28-30). Information was collected on: infant health and feeding, parental demographic information, quality of life, social support and nutrition knowledge (31). Two pilot sessions (with 6 mothersin total)) were carried out to test the questions and timing of sessions.

Topic guide

Key issues, influences and barriers faced by parents whilst preparing to wean were identified from the existing literature and from consultation with a range of stakeholders. These were included in the topic guide if relevant to the research objectives.

Focus groups

Focus groups were conducted in local community venues and were audio recorded and transcribed verbatim.

Data analysis

In both jurisdictions, researchers read the transcripts repeatedly before coding, using the Inductive Thematic Approach (33) with NVivo 11 software in the ROI, and using both Microsoft Word and NVivo 11 software in NI. Researchers in NI and the ROI identified themes in the data. Themes were reviewed and compared between the NI and the ROI research teams, verified using data samples, refined, and agreed upon. The qualitative data was not analysed or described by demographic characteristics or nutrition knowledge score, as preliminary analyses did not reveal differences by these criteria.

Quantitative data was recorded in Excel and SPSS 23, where frequencies and descriptive statistics were carried out to describe participants' characteristics and nutrition knowledge.

Parent panel

After the data collection and analysis, a panel of four parents in the ROI within the target group was recruited to review and appraise the findings and recommendations proposed by the research team.

4 Results

Nineteen focus groups were carried out between November 2016 and July 2017, with 83 participants (81 biological mothers, 1 foster mother and 1 biological father). Eleven focus groups were conducted in the ROI (n=46) and eight focus groups in NI (n=37). Table 1 describes the socio-economic status of participants and illustrates the focus on families at a social disadvantage.

There focus groups in ROI had a higher number of migrant parents (25% born outside of ROI) and more members of ethnic minorities (35%) including Irish Travellers (11%) than the groups in NI. In NI, there was a higher proportion of lone families whereas in the ROI, a higher proportion was on low income (52% were eligible for a medical card in the ROI and 43% in NI were eligible for the Healthy Start programme). A higher proportion of parents in the ROI reported lower social support (no help, or not enough help) than those in NI.

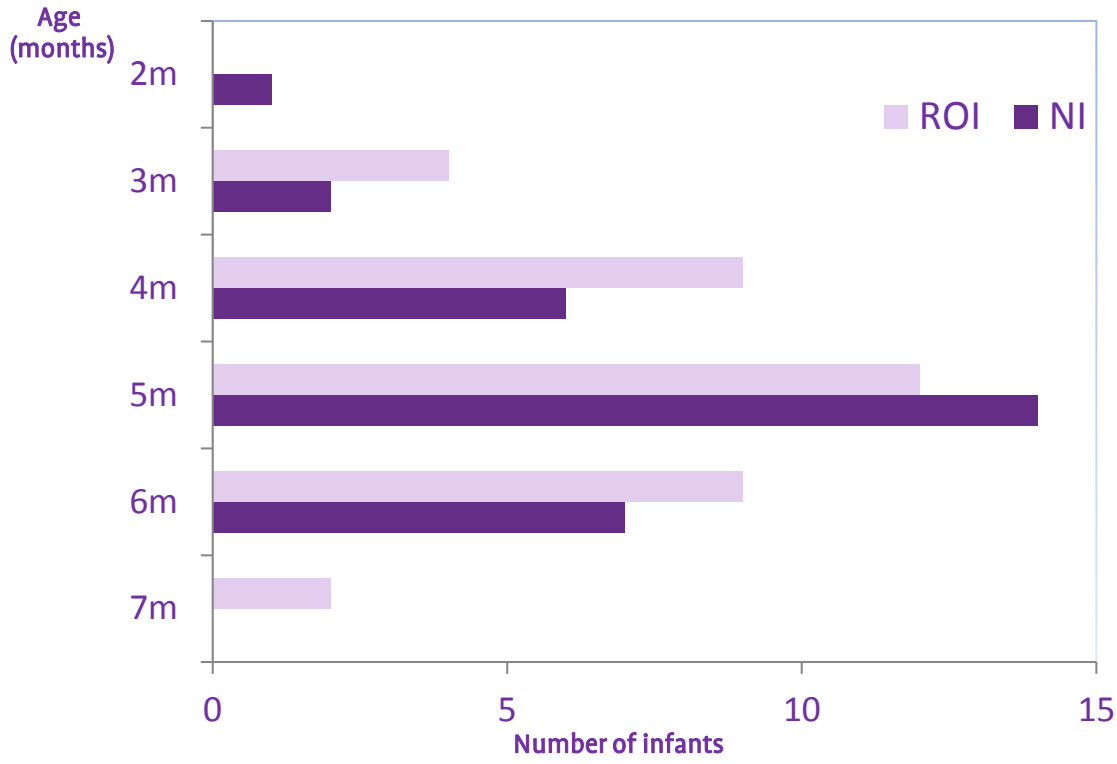
In the ROI, the mean overall nutrition knowledge score was 12 out of 17 (71%); the range of scores was between 3 and 16. When broken down by education level, those with a degree scored 13.5% higher (mean score = 13.24; 78%) than those without a degree (mean score = 10.95; 64%). In NI, the mean overall nutrition knowledge score was 12.6 out of 17 (74%). The range of scores was between 8 and 16. When broken down by education level, those who had a degree scored 6.5% higher (mean score= 13.16; 77%) than those without a degree (mean score 12; 70.5%). The mean nutrition knowledge score was 9.9 (58%) for those who had introduced solids before 4 months of age (n=7).

Table 1 Demographic characteristics of participants in focus groups (n=83)

Demographic characteristic		N ROI	% ROI	N NI	% NI	N IOI	% IOI
Place of birth	ROI/NI	33	71.7	34	92	67	80.7
	Other United Kingdom	1	2.2	1	2.7	2	2.4
	Spain	-	-	1	2.7	1	1.2
	Eastern Europe	4	8.7	-	-	4	4.8
	Africa	6	13	1	2.7	7	8.4
	Asia	1	2.2	-	-	1	1.2
	Not specified	1	2.2	-	-	1	1.2
Ethnicity	White: Irish	30	65.2	36	97.2	66	79.5
	Irish Traveller	5	10.8	-	-	5	6
	Other White background	4	8.7	-	-	4	4.8
	Black or Black Irish: African	5	10.8	1	2.7	6	7.2
	Any other Black background	1	2.2	-	-	1	1.2
	Asian	1	2.2	-	-	1	1.2
Employment	Employed/self-employed	18	39.1	26	70.3	44	53
	Unemployed/home duties	25	54.3	10	27	35	42.1
	Long-term sickness/disability	1	2.2	-	-	1	1.2
	Student	2	4.3	-	-	2	2.4
Marriage status	Married/cohabiting	36	78.2	24	64.8	60	72.3
	Single	4	8.7	10	27	14	16.9
	Separated	-	-	2	5.4	2	2.4
	Divorced	-	-	1	2.7	1	1.2
	Not specified	6	13	-	-	6	7.2
Eligibility for benefits	Full medical card/ Healthy Start	24	52.1	16	43.2	40	48.1
Social support	Enough help	29	63	29	78.3	58	69.9
	Not enough help	8	17.4	6	16.2	14	16.9
	No help at all	3	6.5	1	2.7	4	4.8
	Don't need any help	-	-	1	3	1	1.2
	Not specified	6	13	-	-	6	7.2

In the ROI, the mean infant age was 8.0 months and the age of weaning ranged from 3 months to 7 months. Nine (20%) infants had not yet been introduced to solid foods. In NI, the mean infant age was 7.6 months and the age of weaning ranged from 2 months to 6 months (NI). Seven (19%) infants had not yet been introduced to solid foods. Figure 1 illustrates the age of weaning by region. The most common first foods offered to infants included baby rice/cereal (32.8%), fruit (31.3%) and/or vegetables (23.9%).

Figure 1 Age of infant when first solid foods were introduced (total n=67)



Qualitative findings

The qualitative data in both NI and the ROI was similar overall and therefore is presented together. However, where there are differences specific to NI or the ROI, this is specified in the text. Six main themes emerged from the data that capture the perspective of parental experiences of weaning. These themes are not presented in any hierarchical order.

Choosing baby foods can be challenging

This theme discusses how and why parents chose the foods they offered to their infants. There were varying levels of knowledge among parents in relation to the importance of the weaning period and the weaning diet.

In the ROI, finding culturally appropriate foods was a source of worry and confusion for migrant parents. Other parents highlighted a fear of giving unsafe foods, which related to allergies and under-feeding or over-feeding. Fear of choking was particularly prominent in the ROI.

> *"So then I was a bit worried, was I giving him too lumpy food? And was it too hard for him to digest? But then I just, he never choked and he's still here and he's fine so...! But that was concern, just being lumpy, and not having it really smooth, but it seemed to be fine."*

There were also many misconceptions among parents, which highlighted the varying levels of reliability of their sources of infant feeding advice. In NI, it was clear that the information on the labels of commercial baby-food products had an influence on some parents' knowledge of appropriate weaning practices. Discussions showed that product labels describing foods as suitable from 4 months suggested to parents they could safely wean "from four months".

> *"I started [my child] on (brand name) banana porridge cos they do the wee boxes it's like from four to 6 months and then from 6 months to say 9 months or something so she started on those".*

Commercial food products aimed at the weaning market were frequently discussed in focus groups. In particular, a particular organic brand of baby food was cited by every group in Northern Ireland, and frequently in the ROI, and was perceived as a healthy option due to its organic ingredients. This tied into parental beliefs that organic brands were healthy options and alleviated some guilt that participants expressed around not preparing all the infant's meals at home. However, there were a number of participants who frequently used commercial foods and were happy with this decision, expressing confidence that they must be healthy options if they are marketed for babies.

> *"I tried the (brand name) stuff now...I suppose it would be sort of, yes commercial, but it was probably one of the*

better commercial stuff, as it's fairly pure. She seems to definitely have a bit more of a preference for the (brand name) stuff".

'Everybody has an opinion on what you should be doing'

This theme is based around the plethora of both reliable and unreliable sources of infant feeding advice. Sources are predominantly friends and family, particularly the infant's grandparents.

Advice from grandmothers in all groups was viewed in both a positive and negative light. Some parents felt that their mother or mother-in-law were trustworthy sources of advice or practical help, resulting in some following their guidance. However, some participants considered this source of advice unhelpful, unwanted and an annoyance. Many participants felt a grandmother's advice and experience of weaning was out-dated, resulting in them listening but not acting upon it.

Some participants felt under pressure to wean early and offer inappropriate foods such as sweets. However, one focus group of young mothers in NI discussed the advice they received from their mothers and mothers-in-law and described how they followed it, without question (i.e. use of rusks in bottles), suggesting this particular influence may operate at different levels depending on the knowledge or confidence of the mother of the child.

"And then obviously when they're waking up at night whether its sleep regressions or whatever it's oh that child should be eating, given a (brand name) rusk when you're young, put milk in it, didn't do you any harm, you know? Then you point out to your mother well brand name rusks have quite a lot of sugar in them, - 'didn't do you any harm, look at you, you turned out alright' ".

Peer influence acted as a barrier and also as a facilitator to compliance with weaning recommendations. For participants who stated that they were unsure of which advice to take, pressure from both family and friends convinced them to change feeding decisions. However, some parents described peers as an unhelpful influence on weaning practices and at times felt judged and doubted their own abilities as a mother.

"Like my friend constantly wants to feed her and I'm like "no, leave her alone, you know, she doesn't need it"...

Guidance needs to be accessible, timely and respectful

This theme captures perceived flaws in in current guidance or advice. This includes a perceived lack of clarity concerning what age parents should begin to introduce solids and what foods to introduce first. In addition, in the ROI, parents often feel reassured when they have the opportunity to ask a health professional about weaning, but they felt that this is not generally an option at the time of weaning as there are no scheduled health professional visits[3].

> *"I think it's important, as (other participant) said, when you're given all that when you leave the hospital, like obviously your head's not in the right space, but it's definitely too early like. It's way, way off and you think it's going to be ages before you give food, and you're just learning how to feed him now, and so...definitely, even closer...I know my public health nurse went through it with me at the 3-month check-up as well, but it was still way off."*

In addition, many ROI participants reported that if they received the Health Service Executive (HSE) booklet on weaning (which some did not), this was often misplaced or not to hand by the time the weaning age arrived. This was also an issue in NI in respect of the formal guidance issued by the Public Health Agency (PHA). The timing of information provision was often perceived as inappropriate. This referred predominantly to the health visitor in NI as information on weaning guidelines was provided at the 6-week postnatal visit, which participants considered too soon to receive information.

> *"They gave me lots of leaflets with my first child, in the first visit they give you a wee leaflet like I don't know maybe about 6 weeks or something and you're like "already"? Are we going to read this?! But you're kind of sitting in the kitchen going I will read it before I eventually do it yeah..."*

[3] The schedule of health and development reviews in ROI is available from the HSE link https://www.hse.ie/eng/services/list/2/primarycare/pcteams/dublinsouthpcts/dunlaoghaireglasthulepct/childhealth.html while the schedule for NI is available from the NHS link https://www.nhs.uk/conditions/pregnancy-and-baby/baby-reviews/

Just as with family and friends, health professional advice was a topic of debate among parents. Some felt that health professionals' advice should be strictly adhered to, whilst others mistrusted it for reasons which varied from a previous bad experience, and dislike of the advice given or the tone in which it was given, to feeling that their own personal instinct as a parent was superior to generic guidance. Parents had a variety of preferences for the medium through which information should be provided, with some expressing a desire for an app or website, and others preferring paper copies of resources. In the ROI, some mentioned not having the time to consult HSE or equivalent literature due to time constraints and/or other children.

Participants also felt it was important that the rationale for guidelines was explained, as this would help them to understand changes in guidance. Indeed, those who expressed dissatisfaction with the advice from health visitors or public health nurses often perceived these health professionals to be "out of touch" with the realities of "everyday weaning", resulting in the participants distrusting the advice they received.

Formal recommendations are perceived to be insufficient

This theme reflects participants' opinions and attitudes towards available guidance on weaning, and outlines the various ways these influenced their weaning practices. Generally, there was a sense that formal recommendations on weaning are insufficient to address the practical challenges that parents face, resulting in participants undertaking practices that are contrary to recommendations. Although there are concepts common to both the ROI and NI, this theme has been divided by region to reflect the differences in guidelines available and provided to parents in the ROI and NI.

Republic of Ireland

In recalling their experiences of introducing solid foods, issues which arose consistently were a lack of guidance and confusing guidance. Specifically, the timing of the introduction of solid foods caused significant confusion for parents. If a health professional mentioned 4 months or 17 weeks as a suggested age to introduce solids, this persisted in the minds of some parents and was seen as a time to aim for. In many cases, parents were given different advice from different sources.

> *"I was planning 6 months but when the GP said start… ….The guidance said around 6 months, he said 5, the nurse said 4"*

Parents reported that advice from health professionals acted as a barrier to delaying weaning until close to 6 months. For example, if their baby was described as "large" by a health professional, parents were less likely to delay introducing solids until close to 6 months. Parents often reported that "every

baby is different" and that they started feeding early because their child "seemed ready". Although the guidance is designed to be flexible for this reason, this flexibility was often perceived as ambiguous and a source of confusion. In some cases, advice from health professionals was consistent with the weaning guidelines.

> ***"We were told by 6 months to kind of be in more of a pattern with mealtimes, just kind of start before the 6 months, she said".***

In relation to guidance on the type of foods to give and to avoid and advice (such as supplementation with vitamin D), some parents felt that these recommendations were "provided without basis".

In some instances, parents were aware of the recommendations, but not the rationale for them, and this acted as a barrier to compliance. When the Parent Panel was consulted on this issue, it was suggested that providing the justification for advice would encourage adherence to the recommendations.

Another issue was that sometimes parents simply were not aware of recommendations, which resulted in consultation with a variety of sources, such as internet searches, commercial baby books, family and friends. This led to parents receiving inaccurate or conflicting information at times. Some participants felt there was no practical, fundamental information for the first steps of weaning available, such as how much food to give, at what time of day and by how much to reduce milk feeds. Some breastfeeding parents said that it was an even bigger step for them, as they needed to begin thinking about additional matters, such as beginning to use feeding or sterilising equipment and about maintaining milk supply.

> ***"I'm worried about iron levels. I'm also worried about my milk supply dropping, because I didn't know, I still don't quite know how to balance it and still breastfeed and wean at the same time."***

One prominent topic that emerged was that parents perceived there was insufficient guidance around moving through the weaning stages. In addition, parents did not feel confident that they knew when or how to move through the textures and food types appropriately.

> ***"I was really nervous about starting. Yeah, really apprehensive and I put it off and put it off. I think just***

> *because…I didn't know what times of day, or know…like everyone had told you puree food and put it in little containers and you had all the basic knowledge, but I didn't know…do I give him a bottle first? And what time then after that do I give and how many times a day, how much?"*

Another major fear was around the risk of choking, which also highlighted a lack of knowledge about the need to introduce lumpy foods for the development of oral motor skills.

> *"As well like, the first time I fed him, the first like four or five times actually with solid food, I used to ring my mam to come over. Cos I'd be so nervous like that he'd start choking, I was terrified of him choking".*

Northern Ireland

There was consistent feedback from participants in NI that 6 months was the optimum time to begin weaning. Although none of the participants explicitly identified guidelines which specified this, this age was considered common knowledge. Many participants, particularly those with older children, talked about how the guidelines changed frequently, which for some was a source of frustration and resulted in mistrusting the guidance and following their own approach.

> *"I think the guidelines change so frequently it's hard to keep up with what is current. Like just recently I've three children so you'd think I'd know what I'm doing but it just changes – like the Vitamin D that you're supposed to give from birth. I've not been told that, I've just heard about it on Facebook recently. So it's all sorts of other things as well as weaning that the changes are kind of complicated…"*

However, others appreciated that new evidence had emerged and were keen to consult the guidelines, perceiving them to be an up-to-date source of information. In contrast, some participants felt the guidelines lacked information on "new" approaches to weaning, such as baby-led weaning, and were frustrated there were no official recommendations on this method.

"I'm going to do baby-led and there's no information there ... well I wasn't handed information saying this is information on how to wean your child and when to do it, it's like me having to go and find out myself."

Many participants could not recall receiving advice about giving supplements to their baby, suggesting that some did not receive formal recommendations about vitamin D supplementation for babies. Some felt vitamin D, and vitamin supplementation more generally, wasn't necessary until babies were older. Few were aware of the need for vitamin D from birth, including some breastfeeding mothers who felt their breast milk was sufficient.

"No I didn't really think about 'cos the breast milk is meant to give him everything he needs so I can't really think about vitamins until he was a bit older."

Issues with the availability of appropriate supplements, as well as the taste and cost of vitamins, were also highlighted, suggesting there are several barriers to complying with recommendations.

Most participants were motivated to seek information on weaning practices themselves, and actively sought this out. A concept of "good" and "bad" use of the Internet was apparent in comments made by participants, with certain websites (such as the NHS) considered trustworthy whereas some forums were thought to be unreliable and a potential source of anxiety for parents.

"There's mums as well who like look up the forums and some of them are like 'yeah do this' and some of them are like 'oh God no, everything will go wrong completely'!"

This concept of "good" and "bad" use of information extended to social media, with participants suggesting a negative effect due to "horror stories" and social comparison to other mums. On the other hand, some participants cited social media as a method of accessing up-to-date evidence and a useful way to receive advice on issues such as choking. Although books were viewed as a further source to research weaning, there was a divide in opinions over their usefulness.

"I had to go and do all the research myself you know of what to give them. I bought books upon books to see what to give him to see what the stages were because she didn't go into that detail."

Weaning can highlight feelings of inadequacy, embarrassment and guilt

This theme provides a context to the societal and environmental factors that influence how babies are weaned. In addition, this theme provides both a background to, and a relationship with, the other themes previously discussed.

Throughout the focus groups, it was apparent that the discussion of infant feeding was an emotive topic for many of the participants. Some participants described a lack of self-efficacy – their belief in their ability to accomplish goals or tasks, during weaning and in other aspects of parenting. Parents with older children, having been through it before, appeared more confident with weaning. Participants frequently discussed how stressful the weaning process could be, whether they were first-time mums or more experienced mums reflecting on their earlier experiences.

Parental confidence was a crucial component in identifying appropriate weaning advice and support. Many first-time mums lacked this, needing support to build their confidence in order to wean their baby "properly". Participants who expressed feeling less confident discussed feeling that they could not ask their health professional questions because they felt they were expected to know about weaning already and so were embarrassed to ask.

Some participants feared being judged by others when feeding their infants in public. They felt that they would be criticised for doing something wrong or that others would comment on their feeding decisions, which would lead to regretting their own weaning decisions and make them feel guilty. Participants talked about how everybody has an opinion on raising a child (which begins during pregnancy) and how other mothers would negatively judge each other. This could influence their feelings about, or practices around, weaning their babies.

> ***"No matter what, from when you were pregnant – it was like is there not two in there, you know there's always opinions coming from every road and direction and it's just the same as everything else to do with weaning. Everybody has an opinion".***

The Parent Panel felt this topic was important. A participant of the panel highlighted that a lack of self-efficacy in relation to weaning can often stem from previous experiences (such as illness or concerns during developmental checks) which in turn damage parental confidence before the weaning period has begun. One mother said she felt she was doing everything wrong and weaning

felt like another big step; there was more room to make mistakes. This highlights a need to consider weaning as one part of the life-changing event of becoming a parent.

> *"I felt like I was doing everything wrong"*

Parents base weaning decisions on their own personal circumstances

The discussions across focus groups highlighted the general belief that "mother's instinct" was central to any decision made around weaning, and that "mum knows best". This was discussed in terms of mothers knowing their baby the best due to spending the most time with them, as well as on a more abstract instinctual level. Some suggested that they searched for information on weaning, or accepted weaning advice, that confirmed their existing beliefs. Some participants reflected that their prior beliefs and expectations about the weaning process had not lived up to reality, in terms of it being a more difficult experience than anticipated and not something "natural" or that "just happens".

> *"...and maybe as well because of my lack of... I just thought that these things naturally happen, the kids would just eat the food... I'd never put much thought into anything with my daughter. I just thought that these things will happen. But this time I'm much more aware of what to do."*

Some parents also felt that, whilst health professionals were obliged to give certain advice, they as a parent know their child best.

> *"You're not... You take the advice but you're not actually going to 100% listen to them because...they have to give you that advice but you... I think myself, you know better."*

With regards to influences on weaning practices, these were just as likely to come from the cues of the infants themselves, and parents often discussed basing decisions around infant behaviour. This was particularly important in relation to initiating weaning, and infant cues were often the factor which influenced weaning earlier than 6 months, and in some cases earlier than 17 weeks. Parents who weaned early often did so because of a perception that their child was hungry or needed food, due to

waking up more times during the night, staring at food, or most commonly, drinking what the parent felt was too much milk.

> *"I started weaning, probably 'cause she was following me when I was eating. She was opening her mouth at me. And she was pretty much sucking her bottles dry, so that's when I started."*

Infant weight was another talking point for those who weaned earlier than planned or advised, with often the idea of a "big baby" going hand in hand with a parent feeling as though milk was not "filling" the baby. Participants cited behaviours such as grabbing food, being able to sit up unaided with good head control, showing interest and losing the "tongue thrust", as signs that the baby was ready to be weaned. These infant cues sometimes appeared before the 6-month mark, and demonstrated that parents recognised these developmental milestones related to weaning.

Health or developmental factors also influenced weaning practice. Teething was frequently cited as having an impact on weaning in terms of how the baby reacted to solid foods or changes to their eating pattern. Some babies had constipation or reflux, which resulted in participants offering different food types in an attempt to resolve the issue. In NI specifically, some also noted that their baby demonstrated a preference for finger foods over being spoon-fed. In NI, some participants described how boys needed solids earlier than girls. Thus the findings reflect that some weaning "myths" persist.

Finally, returning to work after six months of maternity leave was cited as a clear influence on weaning before 6 months in the ROI specifically, because parents wanted to have solid feeding somewhat established before leaving the child with another caregiver. This also had an effect on the types of foods offered, relating back to convenience.

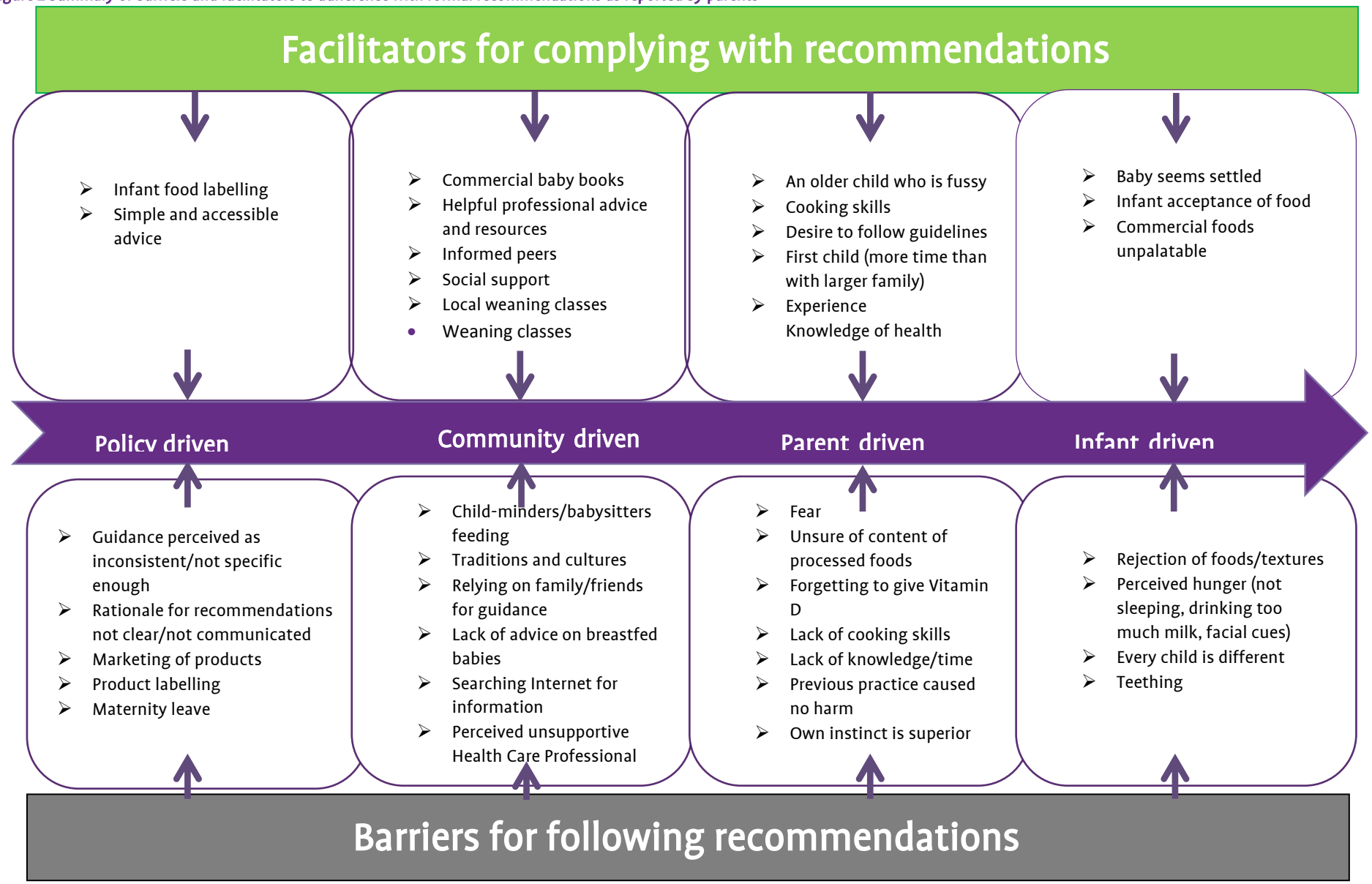
> *"You know, I planned on just before I went back to work, that I wanted him to be kind of started food before I started leaving him with a child-minder or with his granny. So I had planned on leaving him until about five and a half months"*

Key barriers and facilitators to compliance with weaning recommendations

The themes described above capture insights into the experience of parents throughout the stages of feeding solids to their infants. In analysing all the data from the focus groups, and in line with one of

the objectives of this study, a number of key barriers and facilitators to compliance with formal recommendations were identified, which are applicable to both jurisdictions. These are summarised in Figure 2. The facilitators for adherence largely relate to knowledge, support and resources for weaning, in addition to the infant seeming “settled”. Barriers however were slightly more complex, but again often linked to having insufficient or unreliable information, in addition to parental anxiety, confusion and the infant being less “settled”.

Figure 2 Summary of barriers and facilitators to adherence with formal recommendations as reported by parents



5 Discussion

This research study aimed to investigate parents' experiences of introducing solid foods to infants at all stages of the weaning process, and assess the factors that influence their weaning decisions and behaviours. In addition, the purpose of this study was to determine what the barriers and facilitators were for parents to comply with formal weaning recommendations, so that the available guidance can better take account of their needs during this transition.

The findings have shown that, whilst the weaning stage is an exciting time for parents, it presents a number of hurdles in moving towards family foods both safely and healthily. The participants in this study outlined that they receive information from various sources and of varying degrees of quality, and they must choose which sources to rely upon, depending on their own knowledge and self-efficacy. The parents' perceived need for improvements in the guidance available in both jurisdictions was apparent, from practical issues such as the timing, accessibility and content of advice, to more subjective barriers such as communication skills of the health professional or lack of trust by the parent. Participants also conveyed confusion at the many factors to take into account when deciding what types of foods to feed their babies, and for some, this proved more challenging than expected.

Key barriers and facilitators to meeting the weaning recommendations are illustrated in figure 2 and were mapped according to 4 main factors: policy-driven, parent-driven, infant-driven and community-driven factors. Excluding policy-driven factors, the other factors were identified by Harrison and colleagues (34) through their qualitative evidence synthesis of complementary feeding studies and stem from Birch and Venture's ecological model for childhood obesity etiology (35). Illustrating the barriers and facilitators in this way does not imply the factors are separate from one another but may enable health professionals, policy makers, researchers and others to clearly see the numerous factors at play.

The themes identified in this study are largely in line with previous qualitative data around weaning experiences. In line with previous studies, this study highlights insufficient parental knowledge around issues, such as infant weight (36), appetite (37, 38) and sleep (39-41), and how these relate to solid feeding. Additional factors such as fear of allergies (42, 43) and under-feeding or over-feeding (44) contributed to lack of parental confidence in feeding their babies in this study.

In the ROI, there was a greater emphasis on fear of choking than has been reported or indeed than in NI, and some parents reported a difficulty in distinguishing between gagging and choking. Mistrust of weaning guidance from health professionals is also well documented (45, 46), and various levels of knowledge of weaning recommendations by health professionals have been previously reported (47).

Parent lifestyle plays an important role too, and these findings show that those with older children and hectic lives, as well as those who return to work, report facing additional barriers in attempting to remain up to date with weaning guidance. Those participants in ROI who were not born in ROI and come from different cultures highlighted an issue around inclusivity in the guidance available. For example, English may not be their first language and formal weaning brochures and baby resources often recommend foods that are unfamiliar to them.

The value of marketing and topical words used on packaging of commercial baby foods such as "organic" has previously been documented in the ROI (48). This study confirms the influence of marketing, including the infant age for which the product was advertised, which in previous literature was found to undermine the guidance on starting solids (49). The misconception that commercial baby foods are likely to be healthier than home-cooked foods also demonstrates a need for greater awareness and understanding of marketing, packaging and labelling. In addition, further emphasis on the need to avoid inappropriate foods in all forms, for as long as possible into childhood and regardless of whether they are marketed to young children, is necessary.

Issues such as a lack of support, the perceptions of others and self-efficacy emerged throughout this study. Thomson and colleagues have previously highlighted "undermining and insufficient support" and "perceptions of inadequate mothering" in relation to early infant feeding (50), whilst a recent article (51) also highlighted that mothers often feel "policed" in their parenting choices and this negatively impacts their confidence in making choices and feeling secure in these. The same study also highlighted the intrusion felt by pregnant women and new parents in the wake of unwanted advice from both those known to them and strangers. Friends and family have long been documented for their influence on feeding practices, particularly among disadvantaged parents (40, 52, 53). The influence of family has already been identified in a sample of women in the Republic of Ireland (54) and in the current study, friends and family were described as both barriers and facilitators to complying with weaning recommendations.

Participants highlighted a desire to receive information on weaning through a range of formats: websites, an app, books and weaning classes. This range of formats preferred by parents demonstrate that there is not a "one size fits all" solution. It is clear from the parent responses and the literature that the current provision of information is often not perceived to be adequate or received at the right time for mothers who are beginning their weaning journey. Parents desire quick, easy-to-access

resources, and yet feel that much of the information is missing. This presents the dilemma of producing comprehensive information whilst making guidance accessible.

The emerging data around lack of parental self-efficacy in the findings highlights the need to consider weaning as one aspect of the life-changing event that is being a parent. The data indicates that parents need to feel empowered to access information and to ask questions and feel supported by both professionals and peers. It is important that formal recommendations are disseminated clearly and concisely, but that the rationale for such advice is equally accessible so that parents are aware of the implications of practices. In addition, it is clear that good communication and relationships skills that avoid judgement are key in gaining parental trust in conversations around infant feeding and parenting.

> **"You know, to remind yourself that you're doing the best you can, and you know...'good job' kind of thing, like it's a tough old road at times."**

In this study, disadvantage was based not only on traditional socio-demographic characteristics such as income and level of education but other factors such as support networks, culture, ethnicity and nutrition knowledge. These characteristics represent the world and lives of families, where one characteristic such as low-income or low-educational attainment does not define a family or their experiences. The broad criterion for disadvantage was used to capture the challenges families face in life that cross over and influence infant feeding decisions and practices. Indeed, Hoddinott et al (55) suggests that more attention to the diverse values, meanings and emotions around infant feeding within families could help to reconcile health ideals with reality.

While the target group were families at a disadvantage, a small proportion did not meet disadvantaged status. However, major differences were not evident across families, irrespective of demographics or location (NI or ROI) and comparisons with the literature indicate that the findings apply across families and across jurisdictions. However, the recommendations are based on the data shared by the families in this study. While these recommendations would benefit many families in Ireland, this study did not capture families at most risk or at high levels of disadvantage who may need additional resources and support over and above the recommendations proposed.

Limitations

Limitations of this research include the exclusion of parents with very young infants and toddlers, that is, those younger than 3 months and older than 14 months, who may have different concerns or experiences.

While the sample of parents included those at a disadvantage, there are parents at greater levels of disadvantage who do not access community groups and who were therefore not invited to take part in this research study through the recruitment methods used.

Mothers and fathers were invited to take part in this study. However, fathers and male guardians/carers were not represented in this study as all but one participant were mothers or female carers.

This study set out to focus on the experiences of families weaning their infants. The perspectives of healthcare professionals who provide advice and support to families were not captured.

Relevance to current policy and practice

The findings from this study relate directly to child health and obesity prevention policy frameworks in both NI and the ROI, including the 'A Fitter Future for All' policy in NI (56) and the 'Healthy Ireland' framework (57), 'A Healthy Weight for Ireland' (58) and 'Better Outcomes Brighter Futures' (59) in ROI. Certain programmes which fit within these, such as the 'Nurture Programme' (60), 'Making Every Contact Count' (61) and the 'National Healthy Childhood Programme' (62) in the ROI, and 'Making Life Better' in NI (63) include reference to the provision of services to parents of young children, specifically in the prevention of chronic diseases.

6 Recommendations from parents

Recommendations stemming from this research stem from the findings and were compiled together with the parent panel based on their experiences.

Basic information and guidelines

- Provide information to all parents at the time of weaning
- Provide parents with best-practice guidelines and the rationale for such guidelines
- Provide practical information when starting solids (for example: how much milk to give, what time of day to feed solids, feeding environment, how much food to give and how often)
- Provide, or signpost, recipe suggestions to parents along with guidance
- Provide guidance to parents of different nationalities about local foods to use during weaning
- Provide specific information about continuing to breastfeed whilst weaning
- Provide clear and specific guidance on lumps and textures of foods for specific ages, in addition to distinguishing gagging from choking
- Provide parents with information relating to developmental stages, growth spurts, hunger cues and other reasons for disturbed sleep or distress/upset.

Channels for communicating guidance

- Use face-to-face interaction between parents and healthcare professionals
- Publicise advice and resources for parents (for example, weaning support online and in the local community)
- Make weaning guidance for parents available through multiple media channels such as online, apps, paper and video resources
- Provide opportunities for parents to ask questions through multimedia forums
- Explore the use of multimedia channels to provide weaning guidance to the wider family and community, such as grandparents and child-minders.

Training

- Relevant healthcare professionals should be provided with weaning training as part of their continual professional development

- Health professionals should be supported to promote best practice in the timing of weaning, choice of foods, home-cooking and continuation of breastfeeding
- Parents and professionals should discuss the role of commercial baby foods in the weaning process and the likely impact of food labelling and marketing strategies.

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