Abstract

Background: Baby-led weaning where infants self feed family foods during the period they are introduced to solid foods is growing in popularity. The method may promote healthier eating patterns but concerns have been raised regarding its safety. This study therefore explored choking frequency amongst babies being introduced to solid foods using a baby-led or traditional spoon-fed approach.

Methods: 1151 mothers with an infant aged 4 – 12 months reported how they introduced solid foods to their infant (following a strict BLW, loose BLW or traditional weaning style) and frequency of spoon-feeding and puree use (% of mealtimes). Mothers recalled if their infant had ever choked and if so how many times and on what type of food (smooth puree, lumpy puree, finger food and specific food examples).

Results: 13.6% of infants (n = 155) had ever choked. No significant association was found between weaning style and ever choking, or frequency of spoon or puree use and ever choking. For infants who had ever choked, infants following a traditional weaning approach experience significantly more choking episodes for finger foods [$F(2, 147) = 4.417$, $p=.014$] and lumpy purees [$F(2, 131) = 6.46$, $p=.002$] than infants following a strict or loose baby-led approach.

Conclusions: Baby-led weaning was not associated with increased risk of choking and the highest frequency of choking on finger foods occurred in those who were given finger foods the least often. However the limitations of non-causal results, a self-selecting sample and reliability of recall must be emphasised.

Keywords: Baby-led weaning; Choking; Complementary food; Weaning; Solids; Infants; Safety; Mothers

1. Introduction

Baby-led weaning refers to the method of introducing solid foods to infants where the infant is allowed to self-feed family foods rather than being spoon-fed pureed foods[1]. Despite popularity of the baby-led weaning approach growing stronger over the last decade,[2] it is still not considered in guidelines for new parents, in part due to an emerging but small evidence base[3]. Although the method may promote healthier eating and weight gain patterns[4, 5] (though not all evidence is conclusive[6]), concerns are often voiced by professionals about the safety of the method, particularly around potential choking risk[7,8].

Research that has explored the potential risk of choking amongst babies being introduced to solid foods suggests that although choking (as a one off event) appears fairly commonplace, there is no increased risk amongst babies who are self-feeding solid foods. In two studies in New Zealand, although around a third of babies in both studies[8,9] experienced at least one choking episode, there was no difference in occurrence between infants following a baby-led or standard weaning approach[9]. Likewise, an examination of choking occurrence in a randomized controlled trial examining nutritional intake and weight gain of infants assigned to a baby-led or traditional approach found no significant difference in choking occurrence between the two groups[10]. Conversely, the sole study in the UK that examined choking risk via a questionnaire reported that 93.5% of infants had never had a choking episode, although this study relied on recall of the early weaning period by mothers with preschool children[5].

Concern however remains around the method. Furthermore, although showing a positive trend that baby-led weaning does not appear to increase choking incidences, limitations of the existing research include relatively small samples (<200 infants in each case) and a simplified classification of baby-led versus traditional weaning, whereby mothers were asked to identify as being part of one group. Other research examining baby-led weaning has asked mothers to self define their approach but has also measured frequency of spoon feeding and puree use, both to clarify whether chosen approach matches behavior but also to enable more detailed analysis of weaning approach based on degree of spoon feeding and puree use[4, 11,12]. Research has also not examined in detail the choking risk associated with type of food given, particularly in relation to considering type of puree offered (e.g. smooth versus lumpy items).

The aim of the current study was therefore to compare in a larger, quantitative sample episodes of choking between infants being introduced to solid foods via baby-led or traditional methods and to explore factors related to any choking episodes.

2. Methodology

2.1. Participants

Mothers with an infant who had been introduced to solid foods up to 12 months old completed a questionnaire examining their method and experiences of introducing solid foods. Exclusion criteria

included maternal inability to consent and significant infant health issues relating that might be related diet or physical development such as severe reflux, downs syndrome or failure to thrive.

Mothers were predominantly recruited using online methods, using social media and parenting forums to advertise the survey (e.g. mumsnet.com and Facebook parenting groups). Permission was gained from the hosts of these boards to advertise and then a study advert explaining the research and inclusion criteria was placed online. The study advert contained an online link to complete the questionnaire via survey monkey.

Given little is know about the population incidence of baby-led weaning use, and a need to compare groups of similar size, purposive sampling was used to recruit mothers using specific targeting of baby-led websites e.g. www.babyledweaning.com to allow for a subsample of mothers following a baby-led weaning approach to be reached. This was to ensure that a large enough group of mothers following a BLW approach were reached. However it should be noted that umbers following the method in the sample are in no way representative of those following the method in a population sample, as population sample estimates are not available.

2.2. Data Collection

Mothers reported demographic background and infant details (age, gender, birth weight, gestation, any developmental issues). Questions then examined timing of introduction to any solid foods and finger foods. Participants were given the following definition of baby-led weaning

'Baby-led weaning is the process of allowing a baby to self fed rather than be spoon feed. Foods are usually given in their whole form rather than being pureed.'

They were then asked whether they perceived themselves to follow it with response options 'Yes strictly', 'Yes loosely', 'No' and 'I'm not sure'. Participants also estimated a) frequency of spoon-feeding and b) puree use [Response options: 0%, 10%, 50%, 75%, 90%, 100% of the time]. This method has been used to define those following a BLW approach in a number of previous studies[2,4] and was included to cross match against participants perceived status.

Participants were then given a definition of choking, and how it was different to gagging, and asked if their infant had ever choked.

'Choking is defined as a complete blockage of the airway. A baby who is choking will make little sound as air cannot pass through the airway. The baby will be very distressed, grab at their throat or may turn blue. Choking will usually require a caregiver to intervene to force the food out of the airway. Gagging is a normal reflex reaction for a baby learning to eat. Gagging happens when food moves to the back of its mouth and the baby coughs and splutters and brings the food back into the front of their mouth again. Gagging is usually noisy unlike choking.'

If infants had ever choked participants reported how many times the infant had ever choked on a) finger foods b) smooth purees c) lumpy purees. Participants then described each choking episode

including age of infant at time of choking, type of food (finger, smooth puree, lumpy puree), actual food (e.g. apple).

The questionnaire was piloted for usability on a small group of mothers (n = 10) and found to have no issues.

2.3. Statistics

Data were analysed using SPSS version 20. Comparison of types of food offered (finger foods, lumpy puree and smooth puree) were compared for the weaning groups using MANCOVA. Choking was explored by splitting participants into their infant having ever choked/never choked and further exploration made of number of episodes of choking overall and for food type (finger food, lumpy puree, smooth puree) amongst those who had ever choked. For ever choked chi square was used to compare ever choking with weaning group and partial correlations to explore degree of spoon and puree use by ever choked / never choked group. MANCOVA were used to explore number of choking episodes (overall, finger foods, lumpy puree, smooth puree) for the three weaning groups and partial correlations to explore choking episodes with degree of spoon and puree use. Maternal age, education and current employment were controlled for alongside infant age and age of introduction to solid foods.

2.4. Ethics

Approval for this study was granted by a University Research Ethics Committee. All aspects of this study were performed in accordance with the ethical standards set out in the 1964 Declaration of Helsinki. Study information, including researcher details, consent and confidentiality and a debrief were included in the questionnaire. Participants were given instruction to contact their relevant health professional if completing the questionnaire raised any issues with regard to caring for their baby.

3. Results

1151 mothers completed the questionnaire. Mean age was 32.25 (SD 4.82) with a range from 18 – 47. Mean number of years in education was 16.51 (SD: 2.05) with a range from 10 – 18. For further demographic data please see table one. Mean age of infant was 37.62 (SD: 8.85) with a range from 20 – 52 weeks.

3.1. Classifying weaning approach

412 mothers classed themselves as strictly BLW, 377 loose BLW and 362 traditional. The frequency of spoon-feeding and use of purees reflected the definition given of baby-led weaning in the survey (see table 2).

Maternal age [$F(2, 1147) = 3.538$, $p = .029$] and years in education [$F(2, 1148) = 148.156$, $p = < .001$] differed between the weaning groups. Age and education were similar in the strict BLW and loose BLW and both higher compared to the traditional group. No association was found between maternal

occupation and weaning group but mothers currently employed full time were more likely to follow a traditional approach with those not employed a strict BLW approach [x = 18.081, p = 001]. No difference in current mean age of infant between weaning groups was found (see table 2). Maternal age, education and current employment were therefore controlled for where appropriate throughout further analyses.

3.2. Introducing solids

Timing of introduction of solids differed by weaning group [F (2, 1149) = 142.90, p = < .001]. Post hoc bonferroni tests showed that the strict BLW group introduced solids significantly later than those following both a loose BLW approach (p = < .001) and a traditional approach (p = < .001) with those following a loose BLW approach introducing solids significantly later than the traditional group (p = < .001). For introduction to finger foods, no significant difference was found between the weaning groups [F (2, 1149) = .336, p = .715]. For further details of timing per weaning group please see table 2.

3.3. Diet offered

Participants reported the typical number of times their infant ate smooth purees, lumpy purees and finger foods in a day. Strict and loose BLW offered less lumpy [F (2, 1140) = 77.076, p = < .001] or smooth purees [F (2, 1146) = 192.13, p = < .001] and more finger foods [F (2, 1144) = 293.077, p = < .001] compared to the traditional group (table 3).

4. Choking

4.1. Ever choking

155 babies had choked at least once (13.6%). A one-way ANCOVA (controlling for weaning group) found no significant difference in age of introduction to solid foods between those who had ever choked or not [F (2, 1148) = .051, p = .950]. Ever choking was not significantly related to infant gender, birth weight or gestation.

Infants who had choked were offered more portions of food a day than those who had not [F (2, 1129) = 12.61, p = < .001], specifically for lumpy foods [F (2, 1129) = 19.718, p = < .001]. Thus frequency that overall foods and each of the types were offered was controlled for where appropriate.

11.9% of the strict BLW group, 15.5% of the loose BLW approach and 11.6% of the traditional group had ever choked. Analysis of what type of foods (finger, lumpy puree, smooth puree) were choked on was restricted to participants who ever offered that type of food (44.0% smooth puree (n = 506), 38.3% lumpy puree (n = 441) 96.2% finger food (n = 1107). 145 infants (12.4%) had ever choked on a finger food, 10 infants (2.0%) on a smooth puree and 57 (11.0%) on a lumpy puree. No significant

association was found between having ever choked on any food, on a finger food, lumpy puree or smooth puree and weaning group (Table 4).

A multivariate ANCOVA found no significant difference in proportion of spoon-feeding or puree use amongst those infants who had ever choked or not overall, on finger foods or on smooth purees. A significant difference was found in frequency of puree use and having ever choked on a lumpy puree. Those who ate purees less frequently had higher choking episodes on lumpy purees (table 5).

4.2. Number of choking episodes

Overall there were 341 episodes of choking; 237 on finger foods, 93 on lumpy purees and 11 on smooth purees. The mean number of choking episodes for those who had choked was 2.15 (SD: 1.60) [range 1-10]. Modal choking frequency was 1 (36.1%) with 94.4% of babies choking five times or less. Mean age of all choking episodes was 6.23 (SD: 2.21) 67.5% of episodes occurring between 4 – 7 months.

No significant association was found between age of introduction to solid food and frequency of choking [r = -.115, p = .153]. A significant negative association was found between maternal years in education and episodes of choking [r = -.275, p = < .001]. No significant difference in number of choking episodes was seen for maternal occupation but mothers currently full time employed had lower choking episodes than those part time or who were a stay at home mother [F (1, 154) = 11.19, p = .001].

A MANCOVA found that for number of overall choking episodes, finger foods and lumpy purees, infants following a traditional approach had significantly more choking episodes than those following either a strict BLW or loose BLW approach. No significant difference was found between the groups for choking on smooth puree foods (table 4).

Partial correlations (controlling for maternal education and employment) found a significant positive association between degree of puree use and choking episodes for all foods (r = .331, p = < .001), finger foods (r = .241, p = .006), lumpy purees (r = .291, p = .001) and smooth purees (r = .259, p = .003). Degree of spoon use was significantly associated with number of episodes choking on all foods (r = .354, p = < .001), (on lumpy purees (r = .323, p = < .001) and smooth purees (r = .275, p = .001) but not finger foods (r = .162, - = .064). The higher the degree or spoon use and puree feeding, the greater the number of choking episodes.

4.3. Specific foods

Participants specified which foods their infant had choked on. The most common finger foods to choke on were hard/snappable foods such as apple slices or carrot sticks (n = 19), slippery foods such as banana, melon, avocado (n = 17), dry bread especially thick cut with spread (n = 15), food with a skin e.g. sweet potato, blackberries (n = 12) and ‘sticky’ food e.g. granola & porridge (n = 10).

Commercial jars were frequently mentioned for lumpy purees, especially those with large vegetable chunks (n = 14) or pasta (n = 13). Respondents also gave examples of adult meals that had been mashed such as a roast dinner (n = 9). For smooth purees, participants primarily mentioned very smooth commercial fruit and vegetable purees that the infant had inhaled (n = 7) or yoghurt based purees (n = 3).

5. Discussion

This paper explored reported episodes of choking amongst babies being introduced to solid foods, specifically comparing the baby-led weaning method of allowing infants to self feed family foods in comparison to traditional methods of spoon-feeding of purees. Ever having choked and frequency of choking was compared for infants following a strict BLW approach, a loose BLW approach and traditional spoon and puree feeding. Frequency of choking on different food types (finger food, lumpy puree and smooth puree) was compared for infants who received that type of food as the Department of Health in the UK recommend finger foods from six months of age and some infants who were being traditionally weaned were exposed to those foods. Likewise, some infants following a strict BLW had a small proportion of lumpy and smooth puree foods.

Overall, experience of one or more choking episodes was generally low in the sample (13.6%) and did not significantly differ according to weaning group or proportion of spoon-feeding or puree use. Risk of ever choking was therefore the same in infants following a strict BLW approach, a loose BLW approach or a traditional spoon-feeding approach. Examining the frequency of choking amongst those who had ever choked, a traditional approach, (higher in spoon-feeding and puree use) was associated with a greater frequency of choking episodes, for lumpy purees and finger foods. The greater the proportion of spoon-feeding and puree use, the higher the episodes of choking. This was independent of how often an infant received the type of food.

Although the findings must be taken with caution, these findings suggest that *in this sample*, infants following a baby-led method are not at increased risk of choking. The findings support previous smaller studies[5,8,9,10] suggesting baby-led weaning may not increase choking risk. In fact, given that infants following a BLW approach have significantly more experiences with finger foods than those following a traditional approach, it could be argued that risk of choking per food episode is lower in those following a BLW approach.

Before the findings are considered in detail, it should be emphasized that these findings are from a self-selecting sample and not a population based sample. The limitations of this approach and the caution needed in generalising these findings should be noted and are discussed further on. However, the findings raised offer initial support to the safety of the baby-led approach, *at least in a specific context*, moving one step further to understanding this approach on a population level.

Choking is a serious hazard and around one infant a month dies in the UK from choking on food or other items with many others needing hospital treatment[13]. Understanding why and how infants choke and preventing it is therefore an important public health intervention. However, infants have the ability to chew and swallow food from around six months, even if teeth are not present. This is reflected in current Department of Health guidelines in the UK to offer finger foods from six

months[14]. Even without teeth at this stage, infants can use their jaw to chew food, which is sufficient in breaking food up. They also have the ability at this age to use their tongue to move food to the back of their mouth to be swallowed. Moreover, the gag reflex, which stops large items being swallowed, is persistent until about 9 months. This means that large chunks of food would be unlikely to be swallowed[15,16]. Distinguishing between gagging and choking is also important. Gagging is a normal behavior when infants are learning to eat solid food and they splutter or spit out food[17].

Why might infants who are being traditionally weaned be at greater risk of number of choking episodes? Considering finger foods, it could be a lower exposure increases choking risk. Infants who predominantly receive finger foods do not need to switch being solid and pureed foods meaning they know what to 'expect' from a meal and how to manipulate it in their mouths. If a finger food is a rarer event amongst smoother foods, perhaps this increases risk of choking.

In terms of lumpy foods, the diet of traditional infants contained more lumpy puree foods that appear to be a potential risk. Lumpy foods may be a choking hazard for infants as they are unsure whether it is a smoother liquid that they can swallow or something that needs chewing. Infants may become used to smooth purees at the start of weaning and struggle with lumpier ones thinking they can just swallow. Moreover, placing the food in the infants mouth on a spoon may bypass the gag reflex[15,-17]. Indeed, for those infants who were following a BLW approach but received a small amount of lumpy foods, choking risk was higher (although not significantly) for lumpy food items. This rare exposure may explain why they are more likely to gag on them as they are less skilled at manipulating them. This may also explain why infants following a loose BLW approach have more choking episodes (but not significantly) than those who follow a strict approach? Again it could be that these infants have less practice at eating finger foods and also needed to swap more frequently between puree and whole food, leading to increased choking risk.

A number of specific foods were listed as being common choking foods. These included slippery, sticky, or foods with a skin. These foods make intuitive sense to avoid in the first stages of weaning or to give in a less risky form. For example, giving an infant a thin slice of melon that they can suck or chew is likely to be less of a hazard than giving melon chunks which could slip out of a hand and get stuck in the throat. Banana and avocado were also mentioned but these are less likely to cause such a problem as they can be squashed and removed from an airway more easily. However, again, giving a whole banana may be more appropriate than giving chopped chunks that can block an airway.

Interestingly, drier and stickier foods also posed a problem, likely because they may stick in the throat. However these findings need to be taken with caution as it was unknown how often these foods were offered e.g. was melon a choking risk 5% of the time of 50% of the time? Nevertheless they do highlight how specific foods may pose a greater risk to infants and should potentially be given consideration in weaning guidelines. Notably, current Department of Health guidelines in the UK recommend banana and avocado as first finger foods, thus guidance may need to be clearer.

However, these findings *must* be taken in the context of the sample who participated in the study who may well tell us something about any outcomes of a BLW approach. Although suitable for this initial exploration, the data was collected from a sample that has selected both to follow a BLW approach and to participate in the research. This could of course affect wider factors that predispose

an infant to choke. At present BLW is not mainstream or recognized by the Department of Health (despite the recommendation to offer finger foods from 6 months) and therefore those who follow it may represent a certain type of mother – infant dyad. Factors associated with both infant and mother may determine whether a baby both follows BLW and their choking risk.

In terms of infant characteristics, it could be that babies who have had previous feeding problems are less likely to be baby-led weaned. Infants who have an early choking experience (or even gagging frequently on milk) may be generally more prone to choking and more likely to be spoon-fed out of concern that they will choke (even if they start the weaning process following BLW). However, infants with significant health problems were excluded and although 45 infants in the sample had experience of reflux, only 11.1% of these infants had ever choked (lower than sample mean). Further feeding characteristics could determine whether a baby starts or continue with BLW. Infants with a difficult temperament are more likely to have feeding difficulties[18] and be weaned at an earlier age[19] (meaning they are unlikely to follow BLW). Infants who are seen as 'good eaters' may be far easier to baby-led-wean, whereas their fussier or more difficult peers may be spoon-fed in an attempt to encourage them to eat. Understanding the role of infant temperament is an important step in understanding who the method may be appropriate for. Will BLW be safe and appropriate for all?

Maternal characteristics may also well play a role in choking risk. Mothers who follow a BLW have been shown to have lower trait anxiety[20] and feel less anxious around the likelihood of their infant choking[12]. Potentially higher maternal anxiety at meal times might affect choking risk e.g. the temptation to help the infant to self-feed, cutting food items too small or encouraging intake. Higher maternal anxiety is associated with greater pressure to eat out of concern that the infant is not consuming enough[21]. This may explain the difference between those following a strict BLW or loose BLW approach; potentially those following a looser approach are more anxious and want to give their infants a baby-led experience, but want the perceived safety net of giving some pureed or spooned foods. It is also possible that more anxious mothers over interpret choking events, although a clear definition between choking and gagging was stated in the questionnaire.

This sample may therefore represent those who follow the 'gold standard' of BLW. At present we are 'stuck' methodologically in terms of better understanding BLW. Those who follow it have made an active choice to do so, tend to be in contact with others who do so (through online groups) and appear to be generally knowledgeable and well informed about the method. Outcomes for the approach are thus likely to be more positive in part due to maternal background. However to fully understand the method we need a more diverse, likely randomized, sample to follow the method but cannot be sure that generalizing findings to a population sample will be safe. Will appropriate foods be offered? What maternal education is needed to ensure this happens? Can lessons be learnt from those 'gold standard' BLW mothers? Caution is needed but these findings do offer another step towards suggesting that the approach may be safe, *given the right conditions*.

Further limitations include the frequency of choking instances in the sample. Only 13% of infants had any choking episode. Therefore exploration of frequency of choking episodes was for a smaller sample (n = 157). It is unfortunately unclear how many babies choke on a population level for comparisons to be made but this level is between previous studies which have explored baby-led weaning and choking frequency in much smaller samples[5,9,10].

Participants were also older, more educated, and with a higher percentage of professional occupations than average. However this is a common occurrence and limitation amongst much health behavior research[22]. Previous research examining the baby-led approach has also typically found mothers following this method are on average older and have a higher level of education[4-9]. Therefore given the specific recruitment of mothers following a baby-led approach this is an expected outcome and maternal education and current employment were controlled for throughout analyses. Care does need to be given to generalizing outcomes to a wider audience particularly when considering if the baby-led approach can be adopted positively and safely by the wider population but these findings offer an initial reassurance within this population.

It is also possible that the methods used, although suitable to this exploratory study, may lead to bias. Mothers were asked to recall episodes up to 6 months ago. However previous studies examining BLW[5-10] and other studies use recall as a primary method in health related research for a far longer period[23, 24]. Moreover, no significant association was found between recall time and reported incidences of choking. Recall might be affected by maternal guilt or desire to portray the BLW as safe but the proportion of mothers doing this is likely to be very small and the anonymous nature of the online questionnaire would help to reduce this. It would be difficult to avoid in any other methodological set up. Unless observing the mother and infant during mealtimes and waiting for a (rare) choking occurrence, these limitations cannot be avoided.

Recruitment also used online methods of data collection. However, given the need to target specific baby-led communities, online methods were the most suitable method to do this. Moreover, online data collection is now popular in health and social science research[25, 26] and pregnant and new mothers are a well-known user group of internet forums[27]. Use tends to be inclusive of demographic groups[28] and allows cost effective access to large, targeted samples[29]. However it is recognized that membership of such forums and groups may lead to a bias towards older, more educated women and importantly proactive participants who are educated about the method.

Limitations aside this data offers initial support to the safety of the baby-led approach in terms of choking risk. In this particular self selecting sample, weaning approach was unrelated to risk of ever having choked and in fact, frequency of choking was higher amongst those following a traditional spoon-feeding approach. The findings also raise awareness of the types of food involved in choking episodes, confirming the higher risk of hard foods such as apple slices[7] and raising awareness of slippery or stick foods. Given the limitations of the approach these data should not be taken as significant evidence of the BLW method's safety. However they do suggest that further work now needs to be done to test the findings in a more varied sample. The findings must be taken in context to the methodology but they do offer another step towards understanding the safety of the method.

The findings are important for those working to support mothers during the weaning period and should be of interest to those considering the development of guidelines for the baby-led method. They may also prove useful for those designing larger scale research into the BLW approach. Further research is now needed to explore baby-led weaning practices and outcomes in a population based sample.

Transparency statement

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The reporting of this work is compliant with CONSORT[1]/STROBE[2]/PRISMA[3] guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

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480 **Table 1. Demographic background of mothers**

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Indicator	Group	Strict BLW		Loose BLW		Traditional		Overall	
		N	%	N	%	N	%	N	%
Age in years	≤ 19	4	0.34	6	0.51	5	0.43	15	1.3
	20 – 24	12	1.04	12	1.04	38	3.30	62	5.4
	25 – 29	84	7.30	76	6.26	72	6.25	236	20.5
	30 – 34	191	16.59	140	12.16	131	11.38	462	40.1
	35 ≥	121	10.51	140	12.16	116	8.68	377	32.7
Education	School	11	0.09	12	1.04	40	3.37	113	9.8
	College	59	5.12	59	5.12	90	7.81	244	21.1
	Higher	182	15.81	162	14.07	100	8.68	445	38.6
	Postgraduate	160	13.90	145	12.59	111	9.64	351	30.4
Marital Status	Married	322	27.97	280	24.32	251	21.80	852	73.8
	Cohabiting	73	6.34	76	6.60	90	7.81	241	20.9
	Single	16	1.39	20	1.73	20	1.73	56	4.8
Maternal occupation	Professional	117	10.16	105	9.12	113	9.81	84	16.6
	Skilled	165	14.36	161	13.98	152	13.21	150	29.6
	Unskilled	59	5.12	55	4.77	57	4.95	131	25.9
	Stay at home mother	71	6.16	57	4.95	40	3.47	141	27.9
	Total	**412**	**35.79**	**377**	**32.75**	**362**	**31.45**	**1151**	**100**

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484 **Table 2: Mean age of infant and timing of introduction to solids between weaning groups**
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	Overall	Strict BLW	Loose BLW	Traditional
Mean age infant	37.62 (SD: 8.85)	37.27 (SD: 8.46)	38.06 (SD: 8.72)	37.45 (SD: 10.19)
Mean age introduction solids in weeks	21.69 (SD: 5.78)	25.27 (SD: 1.89)	24.29 (SD: 3.09)	19.27 (SD: 4.74)
Mean age introduction finger foods in weeks	24.36 (SD: 6.98)	24.41 (SD: 5.78)	24.13 (SD: 7.06)	24.54 (SD: 8.09)

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489 **Table 3. Proportion of spoon-feeding and puree use and servings of each food type per**
490 **self identified weaning group.**

		Strict baby-led	Loose baby-led	Traditional
% purees	100%	0.0	0.0	3.6
	90%	0.0	0.0	32.0
	75%	0.0	0.0	7.1
	50%	0.0	16.1	35.4
	25%	0.0	18.8	6.1
	10%	6.3	29.6	0.3
	0%	93.7	35.4	0
% spoon - feeding	100%	0.0	0.0	4.7
	90%	0.0	0.0	30.9
	75%	0.0	1.9	21.3
	50%	0.0	18.3	35.9
	25%	2.1	24.9	10.5
	10%	19.7	39.7	1.1
	0%	78.2	15.3	0.3
Mean servings per day (standard deviation)	Smooth puree	0.19 (1.16)	.66 (1.49)	1.98 (1.22)
	Lumpy puree	0.26 (1.08)	.79 (1.18)	1.37 (1.41)
	Finger food	4.81 (2.23)	4.09 (2.04)	1.56 (1.36)
	Total all foods	5.26 (1.23)	5.54 (1.25)	4.91 (1.65)

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493 **Table 4. Frequency of choking episodes and association with weaning group**

		Strict BLW	Loose BLW	Traditional	Significance
Ever choked (% yes)	Any food	11.90	15.50	11.60	X = 8.006, p = .091
	Finger food	11.05	15.46	11.21	x = 19.04, p = .087
	Lumpy puree	12.9	10.4	10.3	x = 11.44, p = .178
	Smooth puree	3.44	1.35	2.10	X = 4.868, p = .301
Number of choking episodes (mean & standard deviation)	Overall	1.94 (1.16) *(n = 49)*	1.73 (1.41) *(n = 66)*	1.83 (.96) *(n = 42)*	[F (2, 153) = 7.901, p = .001]
	Finger food	1.57 (1.03) *(n = 47)*	1.21 (.826) *(n = 67)*	1.76 (.971) *(n = 38)*	[F (2, 147) = 4.417, p = .014].
	Lumpy puree	.32 (.57) *(n = 40)*	.54 (.80) *(n = 57)*	1.18 (1.16) *(n = 39)*	[F (2, 131) = 6.46, p = .002]
	Smooth puree	.71 (.75) *(n = 7)*	.58 (.94) *(n = 26)*	1.14 (1.21) *(n = 37)*	[F (2, 65) = .714, p = .493]

494 *Ever choked: Chi Square; Frequency of choking: MANCOVA*

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Table 5. Frequency of spoon-feeding and puree use for ever choking on specific food types showing mean, standard deviation and MANCOVA result

		Ever choked	Never choked	Significance
Proportion spoon feeding (0 = always, 7 = never)	Any food	2.56 (1.70)	2.63 (1.84)	[F (1, 1139) = .113, p = .893]
	Finger food	2.57 (1.70)	2.53 (1.78)	F (1, 1098) = .051, p = .822
	Lumpy puree	3.03 (1.84)	3.56 (1.61)	F (1, 501) = 3.525, p = .061]
	Smooth puree	4.20 (1.87)	4.08 (1.54)	[F (1, 503) = .612, p = 1.146]
Proportion puree use (0 = always, 7 = never)	Any food	2.80 (1.61)	2.80 (1.77)	[F (1, 1139 = .145, p = .865]
	Finger food	2.75 (1.61)	2.70 (1.72)	F (1, 1098) = .073, p = .787
	Lumpy puree	3.35 (1.60)	3.6 (1.55)	[f (1, 501] = 8.157, p = .004]
	Smooth puree	4.50 (1.64)	4.14 (1.5)	[F (1, 503) = .045, p = .832]