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The potential impact of introducing front-of-pack sugar warning labels on commercial baby food: A qualitative study

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Abstract

Background

High intakes of free sugars (FS) are associated with the development of obesity and dental decay, with origins in the first three years of life. The World Health Organization recommends introducing front-of-pack sugar warning labels on commercial baby foods (CBFs) to help reduce FS intakes. This study identified the facilitators and barriers to reducing consumption of high-sugar CBFs and assessed the potential impact of introducing sugar warning labels on feeding patterns, including FS intake.

Methods

Online interviews were conducted with parents or main caregivers of children aged 6 to 35 months living in England. Facilitators and barriers to reducing consumption of high-sugar CBFs, and the potential impact of adding sugar warning labels was assessed using thematic analysis and the COM-B (Capability Opportunity Motivation - Behaviour) model.

Results

One-to-one interviews were conducted with 25 parents between January - April 2025. Parents knew sugar was unhealthy and actively tried to limit their children's intake. Barriers to reducing high-sugar CBF consumption included an inability to identify high-sugar products, confusion arising from 'no added sugar' and 'only natural sugar' labelling, and health halo messaging such as '0% junk'. Most parents were unaware that pureeing fruit releases sugars or that whole or chopped fruit is recommended over CBF purees. Analysis showed adding sugar warning labels could support reductions in high-sugar CBF use by facilitating product comparisons; however, they would not overcome the influence of misleading claims and marketing.

Conclusions

Sugar warning labels could enable parents to compare CBF products and reduce FS intakes in infants and young children. However, additional label changes (e.g., removing 'no added sugar' labels) and clearer guidance regarding recommended alternatives (e.g., fresh fruit) are needed to more effectively support healthier feeding behaviours. These findings have direct implications for regulatory decisions on CBF labelling policy.

Introduction

An appropriate diet in the early years of life is critical for health, obesity prevention, and the development of healthy eating behaviours[1,2]. The World Health Organization (WHO) recommends limiting intakes of free sugars (FS) to reduce childhood obesity and dental caries, which have adverse physical and psychosocial consequences[2–5]. FS include all added sugars and all sugars naturally present in products such as fruit purees, in which the structure has been broken down; but not the sugars in whole fruit and vegetables[6]. FS account for around 10% of calories consumed by children aged 1 to 3 years in the UK, which is double the national and WHO recommended limit for optimal health[6,7]. In England 23.5% of 4- to 5-years-olds are living with overweight or obesity and 22.4% of 5-year-olds have tooth decay, highlighting the need for early preventative action[1,4].

Many parents believe commercial baby food (CBF) must be healthy, including being low in sugar[8–11]. However, concern is growing over the composition of some CBFs and the widespread use of misleading marketing[12,13]. One third of the energy

in European CBFs comes from sugar[10]. An assessment of 3,427 CBFs across 27 European countries found half included the message 'no added sugar' on their packaging, yet 35% of these products contained FS[14]. WHO's Nutrient Profile and Promotion Model (NPPM) sets out recommendations for the composition and marketing of CBFs, defined as products marketed as suitable for children ≤ 36 months[8]. To reduce FS intakes, the NPPM proposes limiting the use of certain ingredients (e.g., fruit juice), implementing maximum total sugar thresholds, adding front-of-pack indicators (sugar warning labels (SWLs)) and restricting marketing claims[8].

Mandatory action implementing the NPPM in full, as WHO recommends to meaningfully impact public health goals, would impact the CBF industry, which is worth around $54 billion globally[8,15]. As such, the political cost of policy reform and therefore the demand for evidence of effectiveness is considerable, and policy makers require a clear understanding of the potential impact of individual policy components (e.g. SWLs)[16]. To understand the potential impact of adding SWLs to CBFs, as a stand-alone policy, a structured analytical approach to understanding behaviour change is required. The Capability Opportunity Motivation - Behaviour (COM-B) model provides a framework for understanding behaviours (e.g., reducing use of high-sugar CBF), systematically identifying barriers and facilitators to change and understanding the potential for policy interventions to achieve behaviour change[17,18].

This study aimed to i) identify the facilitators and barriers to reducing infants' and young children's consumption of high-sugar CBFs; ii) assess the potential impact of introducing SWLs on feeding patterns, including FS intake.

Methods

This study was approved by the UCL Research Ethics Committee (Study ID: 21253/004) and follows the consolidated criteria for reporting qualitative research (COREQ) guidelines[19].

Study Design and Setting

Individual semi-structured qualitative interviews were conducted with parents. The COM-B framework was used to understand facilitators and barriers to reducing consumption of high-sugar CBFs, followed by an assessment of the potential for SWL to enhance the facilitators identified and challenge the barriers[17,18].

Recruitment and participants

Eligibility criteria included: ≥ 18 years, living in England, parent or main carer for a child aged 6–35 months who consumes CBFs, and able to speak English. Participants were recruited via social media posts, primarily Facebook, inviting people with children under 3 to participate in baby food research. Posts included a quick response (QR) link to additional information and an online questionnaire, which assessed eligibility and facilitated purposive sampling for diversity in ethnicity and socioeconomic status based on Index of Multiple Deprivation[20]. Questions about commonly purchased CBFs were included to help screen out 'imposter' participants[21]. Participants provided written consent before interviews.

Interview

Perceptions of CBFs, sugar and SWLs were explored in semi-structured interviews (Supplement 1). To understand factors influencing assessment of sugar content, participants thought aloud while ranking well-known UK CBFs by sugar content. Additional questions explored pouch feeding and engagement with the CBF industry, which are not reported in this paper. Interviews were conducted by RC and KS. RC is a white female mother with experience of interviewing parents. KS is a South Asian female without children, who was completing a Master of Science degree in Health Psychology. No prior

relationship existed between interviewers and participants. Online interviews were conducted and recorded using MS Teams, and subsequently transcribed verbatim. Participants received a £25 shopping voucher.

Analysis

RC used thematic analysis to identify recurring patterns across participants related to sugar and mapped these to a preliminary COM-B coding framework (Table 1)[17,18,22]. Initial themes were modified following discussions with AR and TD and further developed into facilitators and barriers to reducing consumption of high-sugar CBFs under each COM-B component. The potential impact of SWLs on each facilitator/barrier was then assessed. Additional interventions were then identified, informed by WHO's NPPM, to address facilitators/barriers not addressed by SWLs[2,18]. Analysis was informed by the social ecological model, to explain the role of interactions between individuals, their communities, and the broader environment, in parents' feeding choices[23]. NVivo 14 was used to manage data. Participants did not provide feedback on findings.

Table 1
Initial definition of COM-B components for reducing consumption of high-sugar commercial baby foods

COM-B components		**Initial definition for COM-B coding framework**
Capability	Physical	Parents have the physical ability and skill to select or prepare food other than high-sugar CBF.
	Psychological	Parents can identify high-sugar CBF and are aware of advice to limit children's consumption and reasons for this.
Opportunity	Physical	Parents have opportunities to provide foods other than high-sugar CBF because of their environment (including home and retail environment) and influences such as time and finances.
	Social	Parents have opportunities to feed foods other than high-sugar CBF because of social norms and perceived desirability within the social environment.
Motivation	Reflective	Parents beliefs about the importance of avoiding high-sugar CBF and/or feeding other foods, and how far they prioritize it.
	Automatic	Automatic processes driving parents to avoid high-sugar CBF, such as habits, impulses and emotional reactions to feeding high-sugar CBF.

CBF, commercial baby food

Results

Interviews were conducted with 25 parents of children aged 6–35 months (mean 18.5 months) between January and April 2025 (Table 2). Sessions lasted 33–79 minutes (mean 58 minutes) with no repeat interviews. From 229 survey responses, 43 parents were invited to participate. Facilitators and barriers for reducing children's consumption of high-sugar CBF are summarised in Fig. 1 with example quotes in Table 3.

Table 2
Demographic characteristics of participants

Mother/father		**Number (%) (N = 25)**
	Father	**1 (4)**
	Mother	24 (96)
Ethnicity	Asian	6 (24)
	Black	2 (8)
	Mixed	3 (12)
	White	14 (56)
IMD quintile	1	2 (8)
	2	7 (28)
	3	7 (28)
	4	5 (20)
	5	4 (16)
Number of children	1	11 (44)
	2	11 (44)
	3 or more	3 (12)
Household status	Two parents	22 (88)
	One parent	3 (12)
Child's gender[b]	Female	12 (46)
	Male	14 (54)
		Mean (SD)
Parent's age	(years)	36.1 (5.2)
Child's age[b]	(months)	18.4 (9.9)

[a]IMD, Index of Multiple Deprivation, higher IMD indicates higher relative deprivation

[b]n=26 children as one mother had twins

Table 3
COM-B framework with example quotes for facilitators and barriers to reducing consumption of high-sugar commercial baby food

Psychological Capability	
1.1 **F** Knowledge that sugar is unhealthy	Well, for like teeth health, also like obesity. I wouldn't want her to be addicted to sugar. (P19) I think it would be teeth decay, increased chance of diabetes, you know, glucose spikes leading to all kinds of things. I mean for me, sugar is such a big no-no. (P25)
1.2 **F/B** Confidence/lack of confidence in providing alternative foods	I feel really strongly that all sugar is equally bad except for that occurring in whole fruit…. I really like the Solid Starts app….their advice like about quartering grapes and stuff, like once you know it, it's super obvious but that was good to see. (P25) After a few months [I] realised, yeah, you don't need to buy these pouches or this. Like even, for example, the frozen spinach I buy. That's not a baby product but it's great because it's chopped up already, it's cooked. (P18)
1.3 **B** Unable to identify high sugar CBF	You've got banana, apricot cereal [Heinz Immunity support banana, apricot & cereals], it's a cereal so it won't have any sugar. (P08) I think they're all quite high sugar apart from the first two [Smoothie Melts (67g sugar/100g) and wafers (5g sugar/100g)]. (P09)
1.4 **F/B** Aware/unaware pureed fruit should be limited	I think, I might be wrong, because they're pureed they're almost like having a juice drink rather than the real fruit, so you get a lot more natural sugars, I think. (P23) It's still going to be majority pear or majority apple and they're going to be quite high sugar when they're blended. (P09) Usually they're [Ella's Kitchen] like, you know, sugar-free, like made of fruits... I suppose it's that thing in my mind that fruit sugar is okay but added sugar isn't…. (P04)
Physical Opportunity	
2.1 **B** 'No added sugar' and 'natural sugar' labelling	I think ['No added sugar'] is a good thing… it's the sort of thing I'll probably buy, to be honest, with my older one. It's obviously no sugar, if it says 'no salt' as well, I'm more likely to buy it as well. (P02) It's a natural sugar, that one is fine… I don't think of it as harmful … You know where it's coming from but then added sugar, I'm not so keen…The added sugar because, you know, you've got preservatives, all these other genetic things. You don't know what exactly is in there (P13)
2.3 **B** Brand and on-pack health halos	Ella's Kitchen are so heavily promoted, as like, you know, there's nothing nasty in them, they're all natural. I kind of assumed that those were the ones that were the best. (P04) If I see 'organic', I'm like, "Oh, this must be healthier." … There's a lot of brands out there and sometimes it gets a bit overwhelming as a parent and especially as a new mum trying to venture that out as well. I don't always find it clear… you haven't got time to read everything at the back. (P02) I only assume that because it says it supports your kind of, your [immune] system, like you'd assume somewhat less sugar etcetera (P07) [Other stuff 0%] I think they're trying to say that it has like no sugar, no E numbers, no anything else. (P18)
2.3 **B** Ingredients prominent on labels	I look at the ingredients to see if there's any refined sugar in it and probably there wouldn't be…. Yeah. I think I struggle when it's - So you know, the contents there [Nutrient Information Panel] where it's about kind of sugar and those kind of parts?... I guess I'm not too sure in my head as to what's high and what's low values. (P12) I don't look at the nutrition I just look at the ingredients actually… because that tells me whether there's salt added or sugar added. So that's a busy little packet and I'm

B, barrier; **F**, facilitator; P, participant number

Psychological Capability	
	normally in a rush so I just flip over, look at the ingredients… there's so much information on there, to me the ingredients is just the easiest place to go. (P21)
2.4 **B** Convenience of high-sugar CBF	So we do get them [fruit pouches] sometimes, just as a kind of easy, because we know they'll eat it. And they're good for like when you're out if you don't want to get sticky fingers. (P04) I've always tried to limit giving these things as much as possible. But they're so practical that you- Yeah so I think I give them from a practical perspective…. I'm using say a yoghurt as a snack or a dessert when we're out so that we don't get covered in yoghurt (P16)
Social Opportunity	
3.1 **B** Giving high-sugar CBF is the norm	I just didn't have the knowledge to be honest. And then plus I just thought, you know, I thought that this is what people feed babies, this food. (P03) I'm in like a twin support group on Facebook. And when they talk about, people ask questions about how much they're feeding their babies, and they'll always say, like, "We give them like an Ella's Kitchen pouch." (P04)
3.2 **B** Children like high-sugar CBF	I often try and cut up half an apple and put it in a tub. But I know that my apple is sometimes going to be rejected for a smoothie…. The little biscotti things that I mentioned - they come with two in a packet and it just causes like a tantrum if you try and give one up and save the other. (P16) we try and keep them for out and about but he will spot [CBF cereal bars] ….. sometimes if he's ground me down, I'm just like okay yeah you can have a bar. (P21)
Reflexive Motivation	
4.1 **F** Try to limit child's sugar intake	So I think I'm just trying to limit that [sugar] for the now, for the time being. But when she turns one, I think yeah again it will be a different story. (P15) Just don't want her teeth to rot. Just don't want her sugar levels to go up and down too much. Not that she's got any health issues, but I just think, you know- I don't want her to get too much of sweet tooth either. (P23)
4.2 **F/B** Believe fruit pouches are inferior/equivalent to fresh fruit	because they're pureed they're almost like having a juice drink rather than the real fruit, so you get a lot more natural sugars, I think. So, I try and steer clear of them (P23) [Smoothie Melts (67g sugar/100g)] haven't got anything, obviously nothing added to it... although it doesn't look like fruit … it does have the goodness of the fruit in it. (P06)
4.3 **F** Belief CBF is second best	With my eldest son I made almost like I would say ninety-nine per cent of everything that he had, with my second I didn't have like the benefit of so much time. (P05) The only thing I worry about with this is like, obviously, they make the product. How do they keep it so fresh in the packaging? (P02)
4.4 **B** Trust CBF is safe, healthy and recommended	I feel like it's more regulated…I was quite reliant on, yeah, I felt safe with the baby stuff. Partly choking but also because of what's in it. I knew that, or thought that, it would be better for him. (P01) Like well-known, well-established brands then I sort of, yeah, have the peace of mind knowing that, you know, they'll be safe and be healthy for my baby. (P15)
4.5 **B** Desire for child to eat enough	Like just now they wouldn't eat the potato [and cheese], we've just given them a package of like, they call it like baby breakfast. It's like a mix of like yoghurt and porridge and fruit that we keep on hand for times when they won't eat anything. (P04) if she's not eating any of that I give her something just- Especially in the evening just to make sure she's got a fully belly because I want her to sleep really well. (P23)
B, barrier; **F**, facilitator; P, participant number	

Psychological Capability	
Automatic Motivation	
5.1 **B** Instinctive urge to see child happy	He would like have that [pouch of jelly] probably if he's like a bit ratty, to be honest. It's really bad to say. (P01) I did try Ella's Kitchen, mango puree…I bought lots of [fruit] pouches from Ella's Kitchen, yeah, because my baby loves that. (P24)
B, barrier; **F**, facilitator; P, participant number	

1. Psychological Capability

1.1 Facilitator: Knowledge that sugar is unhealthy

All parents described sugar, added sugar and/or sugary foods (e.g., cookies, chocolate) as unhealthy. They associated sugar with tooth decay, weight gain, diabetes, hyperactivity, disturbed sleep and babies developing a 'sweet tooth'.

1.2 Facilitator/barrier: Confidence/lack of confidence in providing alternative foods

Some participants confidently fed lower FS alternatives to high-sugar CBFs (e.g., plain rice crackers, fresh fruit), sometimes having attended a feeding workshop or used an app (Solid Starts). By contrast, those relying on pouches often viewed alternatives as complex to prepare or raised concerns about choking.

1.3 Barrier: Unable to identify high-sugar CBFs

Parents struggled to rank foods by sugar content. Some felt '100% fruit' products contained the most sugar, others believed desserts or biscuits contained more sugar. Products that included vegetables, those from premium brands, and those labelled for younger babies were perceived as containing less sugar. Several parents assumed a wafer (5g sugar/100g) and a fruit-derived snack (67g sugar/100g) had similar sugar contents as they were both fruity snacks in similar packaging (Supplement 2).

1.4 Facilitator/barrier: Aware/unaware pureed fruit should be limited

A few parents said they avoided purees - they compared purees to smoothies and explained that blending fruit released sugars and/or reduced fibre. However, most parents viewed fruit-based CBFs as having only natural sugar or being natural sweet, and therefore not as a source of concern. The term 'free sugars' was used by one mother, who avoiding purees, but no other parent was familiar with the term.

2. Physical opportunity

2.1 Barrier: 'No added sugar' and 'natural sugar' labelling

Most parents were drawn to products with 'no added sugar' labels, suggesting these contained no sugar, nothing artificial or were generally healthy. Parents were also reassured about healthiness by 'contains naturally occurring sugar' labels.

2.2 Barrier: Brand and on-pack heath halos

Many parents described the large number of CBFs available and the amount of information on labels as overwhelming. With limited shopping time, they relied on heuristics, buying trusted brands without scrutinising individual products or relying on packaging cues. Messages such as 'organic', 'no junk promise' and 'other stuff 0%' suggested to some parents

that products contained less sugar. Some were drawn to check lists ('No added colours', 'No preservatives' etc.). Others were sceptical, describing on-pack messages as 'just marketing', although they said that frustratingly they were still drawn to CBF products as the packaging was visually appealing.

2.3 Barrier: Ingredients prominent on labels

Parents described turning to ingredient lists to assess 'what's inside' a product, as these were usually prominently displayed and easy to locate. Lists including recognisable ingredients (e.g., apple, apple juice) but excluded 'sugar' were perceived as healthy. By contrast, nutrient panels, listing sugar content (g per 100g) were smaller and perceived as difficult to interpret as feeding guidance as they were unsure how much sugar was appropriate.

2.4 Barrier: Convenience of high-sugar CBF

Parents liked CBF pouches and snacks for their individual-portion-packs and shelf life. Many kept these in store cupboards, pushchairs or changing bags for whenever they might be needed. Fresh fruit was viewed as more effortful as it might go off if forgotten, cause mess or be rejected.

3 Social opportunity

3.1 Barrier: Giving high-sugar CBFs is the norm

Parents described exposure to CBF marketing, seeing multiple shelves of CBFs in supermarkets, and observing and talking to fellow-parents about CBF, including via online parenting forums, which led them to view the use of CBFs as the norm for infants and young children.

3.2 Barrier: Children like high-sugar CBFs

Children were described as sometimes rejected fresh fruit or CBFs containing vegetables, but loving sweet CBFs, including fruit purees, yogurts, snacks and sweet vegetable mixes. Parents described sometimes acquiescing to children's demands, giving sweet CBFs or allowing larger than planned portions.

4. Reflective motivation

4.1 Facilitator: Intention to limit child's sugar intake

All parents believed it was important to limit their child's sugar intake and made efforts to do so, such as avoiding foods listing 'sugar' as an ingredient. Some also avoided CBFs that they'd found were sweet-tasting, including fruit/vegetable mixes.

4.2 Facilitator/barrier: Believe fruit pouches are inferior/equivalent to fresh fruit

Some parents, particularly those drawing parallels between smoothies and CBF purees, viewed purees as inferior to whole/chopped fruit. However, fruit pouches were generally viewed as equivalent to fresh fruit and therefore as recommended, with the sugar in them (like fresh fruit) being cancelled out by the 'goodness'. Some felt uncertain about whether fresh fruit should be limited as dentists had warned them that fruit was as bad as any other sugary food.

4.3 Facilitator: Believe CBF is second best

Some parents viewed home prepared foods as an unachievable ideal. The long shelf-life of CBFs and texture of some snacks (e.g., puffs) signalled they were unnatural, and therefore second best. CBF snacks made from fruit juice were

perceived less favourably than purees as they were considered more processed and not equivalent to anything parents could make themselves.

4.4 Barrier: Trust CBF is healthy, safe and recommended

Many parents, particularly first-time parents, relied on CBFs, trusting products were appropriately regulated to ensure they were healthy, didn't present a choking hazard and were uniquely suited to infants' requirements. This trust extended to products without age guidance labels indicating suitability < 36 months, but seen as such (e.g., jelly pouches, small pots of yogurt).

4.5 Barrier: Desire for child to eat enough

Parents, often feeling worn out and sleep deprived, described choosing foods they knew would be accepted. Being a good parent was associated with ensuring children eat enough and aren't hungry. Some also mentioned potential consequences of hunger, including tantrums or not sleeping.

5 Automatic motivation

5.1 Barrier: Instinctive urge to see child happy

Parents took pleasure in seeing their children happy, including seeing them enjoying food or being soothed by food. This was particularly true for snacks, where nutrient quality was considered less important than for main meals.

6 Potential impact of SWLs on feeding behaviour

Parents responses to SWLs are summarised by three themes, with example quotes in Table 4.

Table 4
Themes for potential impact of sugar warning labels on feeding behaviour

Theme	Sample quotes
6.1 SWL is a prompt to give lower sugar alternatives	I might think, Okay, give her a banana. Give her some strawberries. It's still a snack. It's nutritious. It's going to be natural sugars but, yeah. I think it would make you kind of question your decisions in what you're buying for your child. (P13) Probably just fruit [instead of product with SWL]. So I've chopped up grapes before and now he can eat a whole apple and stuff, so I'd probably just take fruit, maybe plain unsalted rice crackers. (P21) Because I said this to him [dentist], I go, but my kids like fruit. But then they tell you to eat fruit and they tell you to eat vegetables but then they tell you there's too much sugar, so you have to eat it in moderation. (P07)
6.2 Ignore SWL if it's just fruit or natural sugar	I think with like the bars, I probably wouldn't buy it. I might buy a pouch and it says, high sugar. Well, I know it's high in sugar because, you know, it's got loads of fruit in it. (P04) they are saying that it's high in sugar but obviously fruit is naturally high in sugar so it's a bit of a difficult one. I think in my mind if it's just fruit puree, it's almost like that one shouldn't have it on because it's natural. (P06)
6.3 SWLs would be helpful	If it was like an easy, clear label like that and you knew that every product had to have it, it would make it really easy to choose between [products] and I think it would force the companies to do something about it as well. My son does have like a bit of chocolate and a bit of this, but I feel like I'm in control of that. Whereas if there was a lot [of sugar] in these products, I wouldn't necessarily be tracking that in my head as much. (P01) I think that would be really good, yeah, because like I say, I do read a lot of backs of packets and I do pay attention to it but I'm probably still, looking at those Smoothie Melts I got it completely wrong.... I think that would be really helpful just to see, at first glance, okay, maybe that's more of a treat. (P09)

SWL, Sugar Warning Label

6.1 SWLs as a prompt to give lower sugar alternatives

All parents said seeing SWLs on CBFs would prompt them to seek lower sugar alternatives, although they might still give these products occasionally. Proposed alternatives included similar products without SWLs (e.g., another yogurt pouch), fresh fruit, savoury baby snacks, non-CBFs perceived as low sugar (e.g. plain rice cakes), or they would check labels of similar products (e.g. kid's cereal bars) to identify lower sugar alternatives.

6.2 Ignore SWL if it's just fruit or natural sugar

Many parents said that seeing SWLs would prompt them to examine packaging. If ingredient lists included only fruit, or labels suggested only natural sugar was present, then said they would probably ignore the SWL. Some had reservations about SWLs, believing they wrongly lumped added and natural sugar together, whereas they believed only added sugar was problematic.

6.3 SWLs would be helpful

Every parent supported adding SWLs to CBFs and a few said they would trust brands who used them over other brands. Some felt including the percentage sugar on SWLs might be helpful or thought SWLs could go unnoticed on busy colourful packaging.

Potential impact of SWLs on facilitators and barriers

Parents responses indicated SWLs could support a reduction in high-sugar CBF consumption by addressing key facilitators/barriers (Fig. 1). Concurrently removing 'no added sugar', 'natural sugar' and other health halo messaging would

address physical opportunity barriers likely to counteract the utility of SWLs. Effectively communicating that pureeing releases sugars, and providing practical guidance about age-appropriate alternatives, would further support behaviour change. Some facilitators/barriers would not be addressed directly by these intervention components, including the convenience of CBFs or children's liking for them.

Discussion

Findings highlight the complexity of parents' decision-making in considering how to feed infants and young children. Multiple facilitators and barriers to reducing consumption of high-sugar CBFs were identified. Parents actively tried to limit their children's sugar intake but struggled to identify high-sugar CBFs. Packaging design contributed to perceptions that fruit-based CBFs were equivalent to whole/chopped fruit. Adding SWLs to CBFs could support a reduction in the purchasing and use of high-sugar products. However, additional packaging design changes, paired with clearer feeding guidance, would more strongly support a reduction in FS intake.

Results add to the growing body of evidence regarding the commercial determinants of health and the role of CBF packaging in misleading parents via a range of implicit and explicit design features[8,13,14,24,25]. By focusing on sugar, we were able to gain a deeper insight into factors impacting cognitions relating to sugar within the wider context of parents' decision-making. Findings support WHO recommendations to add SWLs to CBFs[8] and raise concerns about implementing SWLs as a stand-alone policy. The four intervention components considered in Fig. 1 would directly address parents' psychological capability and physical opportunity, and thereby indirectly impact reflective motivation and challenge social norms regarding high-sugar CBFs[17,18].

In line with previous research, we found SWLs reduced parents' perceptions of product healthiness and intentions to purchase, with many suggesting they would switch to lower FS alternatives, including fresh fruit[11,13,26]. However, echoing parents in previous focus groups[11], some parents indicated they might ignore SWLs on products such as fruit purees. Using in-depth one-to-one interviews and the COM-B framework, elucidated a clearer understanding of the beliefs behind this, and the need for wider changes to packaging to overcome additional barriers to reducing high-sugar CBF consumption[17,18]. In line with findings from a review of consumer understanding of sugar-terminology, parents generally perceived 'natural sugar' as distinct from, and healthier than, 'added sugar'[27]. Findings add to the evidence base demonstrating 'added' and 'natural' sugar labels mislead parents about the sugar content of products and act as a barrier to meeting public health limits on FS intake[11,13,28,29]. Australian parents, like those in the current study, describe being drawn to CBF pouches with 'no added sugar' labels, with experimental evidence indicating they are 13.7 times more likely to choose products with 'no added sugar' labels[30,31].

Our analysis supports the need for legislation to implement a range of mutually reinforcing policy elements as proposed by WHO, rather than only SWLs[8]. WHO recommends prohibiting all compositional, health and marketing claims on CBFs, including those shown to encourage purchasing in this research (e.g., 'no…', 'natural', 'organic')[8]. A wide range of packaging features, including colours, fonts and imagery (e.g., fruit) create misperceptions about the nutritional quality of products, and as parents in the current study recognized, awareness of marketing doesn't reduce appeal[15,32]. Parents' trust in CBFs extended to products not labelled as suitable for children ≤ 36 months, but marketed and packaged similarly, therefore the impact of applying legislation only to products labelled for ≤ 36 months, needs further research.

While both UK and WHO dietary guidelines for sugar are based on FS intake, the public struggles to define FS or identify sources[27]. Only one mother in the current study was familiar with the term FS although several recognized that whole fruit was recommended over fruit smoothies. Effective messaging highlighting that pureeing releases sugars, and that whole/chopped fruit is recommended as soon as babies can manage it, would strengthen the impact of packaging reforms and ensure SWLs would not reduce perceptions regarding the healthiness of whole fruit. Research is needed to understand

how to effectively communicate this on CBF labels, in public health resources, CBF brand communications and via childcare and healthcare professionals, including dentists[33]. This should be accompanied by clear practical examples of convenient affordable age-appropriate alternatives to high-sugar CBFs[34]. In line with the principles of responsive feeding, parents should be guided to limit food choices to healthy options[35–37]. While children's liking for sweet-tasing foods may be innate, increasing early exposure to non-sweet foods, including plain snacks and bitter vegetables, would increase acceptability of a diverse range of minimally processed foods[38,39].

Current CBF marketing presents a barrier to parents following feeding guidance and there is increasing recognition of the need for mandatory policies restricting the marketing of less healthy food products[40,41]. The impact of such policies is more likely to be equitable across socioeconomic groups than simply providing dietary guidance[42]. Together, the actions discussed here would promote other dietary goals beyond sugar, including increasing exposure to, and acceptance and consumption of, minimally processed foods, thereby impacting long-term diet and health[39].

Strengths and Limitations

This study included parents with diverse characteristics, and a systematic analytical approach was used (COM-B), which has recognized utility in policy contexts[18]. Limitations include not interviewing non-English speakers and other individuals with feeding responsibilities (e.g., grandparents, childcare professionals) and not assessing socioeconomic differences in responses.

Conclusions

This qualitative study offers rich and novel policy-relevant insights into decision-making processes around parental feeding of infants and young children. Results indicate adding SWLs to CBFs could reduce FS intakes. However, introducing SWLs as a stand-alone policy, without additional changes to CBF packaging, may have limited impact. Improved feeding guidance would address additional facilitators and barriers to reducing high-sugar CBF consumption and adopting healthier feeding behaviours. Our study adds to the literature by highlighting how specific CBF label changes would support informed consumer choice.

Abbreviations

CBF
Commercial Baby Food
COM-B
Capability Opportunity Motivation - Behaviour
FS
Free Sugars
SWL
Sugar Warning Label
UK
United Kingdom
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

Ethical Approval for this study, in accordance with the Declaration of Helsinki, was sought and obtained from the UCL Research Ethics Committee (Study ID: 21253/004). All participants provided written informed consent prior to interviews commencing.

Consent for publication

All participants signed informed consent, including consent for the research to be used for publication.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to protecting the anonymity of interview participants, but an anonymised version may be made available from the corresponding author on reasonable request.

Competing interests

The authors declare no competing interests.

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Authors' contributions

RC, AS & CL conceptualised the study. RC designed and planning the study. RC & KS completed the data collection. RC analysed and interpreted the data with input from AR and TD. RC drafted the manuscript, all authors reviewed and contributed to the final manuscript

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Figures



Figure 1

Facilitators and barriers for parents to reduce children's consumption of high-sugar commercial baby food and interventions to address these

Supplementary Files

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