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Factors influencing perceptions of processed baby foods and feeding practices among Indian mothers: a qualitative investigation

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Abstract

Objective To explore how professionally qualified, working Indian mothers conceptualize healthy foods in general, perceive processed infant and baby foods available commercially and what feeding practices they actually follow with their children at home.

Design Five focus groups with 8–12 participants were conducted around the participants' conceptualization of healthy food, their perceptions about commercially available processed baby and infant foods and their actual feeding practices that they routinely follow with their children. Discussion transcripts were analyzed using an inductive coding approach.

Setting India.

Participants Fifty-one professionally qualified, working women with at least one child under 5 years of age.

Results Participants agreed that fresh food is healthiest. They also had favorable opinions about processed infant and baby foods with regards to healthfulness, hygiene and safety. Healthy foods were largely conceptualized in relation to nutrient claims, ingredients and discernible health outcomes. They use cues, such as health claims, brand, price, package design and others to determine healthfulness of the product. Perception was heavily influenced by these extrinsic cues rather than by participants' own nutrition knowledge. Despite having the knowledge, most participants admitted to using these foods on account of factors such as their own inability to lactate, social pressure, lack of time and convenience.

Conclusions Most educated and well off people continue to use these products. While they rue the lack of stringent regulatory measures in India, they feel there is an urgent need to address this huge policy gap by way of legislation and regulation.

Keywords Qualitative research, Consumer behavior, Food policy, Healthiness, Perception, Processed baby food

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Background

Globally, diet patterns are undergoing transformation from subsistence to modern food systems due to economic transition. This Nutrition Transition is characterized by changes in diet patterns and physical activity [1]. Diets have become more westernized [2] and shifted away from conventional home-cooked meals [3]. Dietary transformations are largely driven by urban consumers and are accompanied by drastic changes in food production and marketing systems [4]. Globalization, urbanization [1] and trade liberalization have paved the way for availability of cheap, processed foods thereby ramping up diet related non communicable lifestyle diseases such as obesity, hypertension and diabetes [5, 6].

Owing to higher disposable incomes, a greater number of women in the workforce, and less time to spare in the kitchen to prepare conventional meals, India too has been witnessing a rise in the consumption of packaged and processed foods [7], including for infants and young children [8]. Most products have low nutritional value and abnormally high levels of sugar, sodium, saturated fat, total fat, artificial additives and preservatives [9, 10]. Hence, devising strategies to effectively reduce the adverse impact of unhealthy diets is critical. Strategies ranging from mass communication campaigns, regulatory guidelines regarding balanced nutrition, packaging and labelling policies, information disclosure, use of permissible additives and preservatives, nutrition education programs have been implemented across the world [11]. Studies show that healthiness of food lies at the heart of many purchase and consumption decisions [12–14]. This concern becomes more pronounced for commercially available infant and baby foods.

The initial two years of a child are very critical for forming dietary habits. The child is exposed to a diverse range of foods to equip it to make a smooth and gradual transition to adult diets [15]. Parents influence them through the foods they introduce and the way they do it [16]. Their decisions concerning food purchase and consumption are shaped by the automatic mental associations they elicit [17]. This makes it critical to uncover their understanding of foods and nutrition and their perceptions regarding different foods. Child health is such a critical global policy issue that the World Health Organization (WHO) recommends exclusive breastfeeding for the first six months and thereafter, providing nutrient rich, safe complementary food alongside breastfeeding that should continue up to at least two years of age. WHO has taken cognizance of marketing of commercially sold Breast Milk Substitutes (BMS) and has come up with the International Code of Marketing of BMS. It has also come up with a global strategy for infant and young child feeding and has mandated that processed food products for this segment must meet applicable standards laid down by the Codex Alimentarius Commission and the Codex Code of Hygienic Practice for Foods for Infants and Children [18]. This underscores the importance of health and healthy food, especially for children. However, the definition of healthy food continues to remain a grey area. Conceptualization and perception of healthy food [19], especially for infants and young children remains fuzzy [20]. For instance, much of the packaged infant and toddler milk and snacks, including in developed countries [21, 22], are ultra-processed and high in elements of concern such as total sodium and sugar [23].

Amidst information overload, customer perceptions about food healthiness get shaped up in very different ways [12]. On one hand, there are agencies like the government sharing official nutritional recommendations, global agencies like the WHO with their own set of recommendations, healthcare practitioners coming from a scientific standpoint, the elderly in families coming up with their recommendations shaped by their experience and passed down to them through their earlier generations [24, 25]. On the other hand, we have food companies from a commercial standpoint, the press and the social media [26, 27] that promote them copiously. All these elements interact with each other and play a huge role in shaping perceptions of healthiness and healthy food. This makes the concept of food healthiness very dynamic and complex [28, 29]. Studies show that for toddler snacks, parents perceive products with the regulated nutrition-content claim “no added salt” and/or “no added sugar” as much healthier than products that do not make such claims. Similar things have been observed in the case of toddler milk where claims of recommended dietary intake (RDI) of minerals and vitamins have been emphasized [30]. Yet, consumption of ultra-processed foods among infants is a critical concern owing to its association with adverse health outcomes [31]. The number of mothers in employment has gone up and so has the household disposable income of families where the mother is professionally qualified and commands a high salary at work [32]. This changing landscape [33] also coincides with increased use of processed and packaged infant and baby foods [34]. Exposure to a deluge of advertisements across different platforms further augments their use [35]. Hence, health promotion amongst mothers becomes key to combating diet-related child health issues. In this context, we aim to achieve three objectives: [1] qualitative exploration of how these mothers conceptualize healthy food [2] explore their perception of healthiness of the processed and packaged infant and baby foods [3] get an insight into the feeding practices they actually follow at home with regards to such foods.

Methods

Participants

The inclusion criteria were professionally qualified, working mothers with child(ren) aged between 0 and 5 years. While the age group of interest is 0–2 years, we had expanded our sample to include mothers of children between the age group of 0–5 to understand the practices they followed when their children were infants, i.e. under 2 years of age. A total of 51 participants were involved in this study conducted virtually through Zoom. Participants were recruited using a LinkedIn advertisement targeted at Indian working mothers. Participants were also recruited through WhatsApp advertisement in professional peer groups. The advertisement invited professionally qualified and employed participants with infants and toddlers up to the age of 5 to join a group discussion about commercially available baby and infant foods. The potential participants were informed that this research was academic and that their data would not be shared with any third party. Since there were a few qualifiers (as stated earlier) for participating in this study and participation was voluntary, it was self-selection. No material rewards were promised. A lively and beneficial session with a lot of learnings from fellow mothers was promised. Participants expressing their interest (n=63) took an online survey designed by the author where they gave their consent for participating in the study, registered themselves, provided their contact details and answered a series of questions relating to their socio-demographic characteristics such as gender, age, city, educational level, professional status, socio-economic level, number of infants and children at home. They also answered some basic questions about their perception and use of commercially available baby foods. There was one question related to their availability for the focus group wherein they had to pick their preferred time/date slots. Each participant could give 3 slots as per their preference.

Five focus groups with 8–12 participants (n=51) per group were conducted. Participants were randomly selected and contacted to check their availability to participate in the discussion, scheduled on weekends during late afternoons over a 45-day period. The groups were largely homogenous in terms of age group, professional qualification and income levels. Yet there was some diversity within these criteria as well as the geographies that they represented. So, women were allocated to different groups so as to achieve near homogeneity across participant groups in all discussions. The final number of participants dropped from 63 to 51 as some pulled out citing other commitments on the scheduled dates. The sample size is similar to other qualitative studies carried out in other contexts such as heuristics that guide people's perceptions towards ultra-processed foods [36–38]. Each focus group discussion had just the author and allotted participants. The meetings were recorded as they needed to be transcribed for analysis. However, owing to privacy concerns, participants were assured that those recordings would not be watched by anyone else other than the author nor would they be shared with any third party. Discussions were conducted till saturation was achieved [39]. New topics kept emerging during discussions till the penultimate round. No new topics emerged in the last round. Then further rounds were stopped as saturation was achieved. Focus groups were conducted because they are a useful tool to help identify different dimensions of health behaviour related to healthy diet [40, 41].

Table 1 Questions included in the discussion guide of the focus groups

S.No.	Question
1	What does healthy food mean to you?
2	When you are shopping for food, how do you know if a product is healthy?
3	Name some packaged foods that you buy (product and brand name, e.g. Lactogen, Nan Pro
4	(Packages of ultra-processed products are shown) What do you think about these products? Are they healthy? Why?
5	Do you usually read the nutritional information displayed on packages to know if a product is healthy?
6	What images and words used on the product label appeal to you?
7	Do their corresponding advertisements appeal to you? If yes, what aspects of the advertisement? (could be a health claim, like stronger bones, could be increase in scholastic aptitude, e.g. toppers in class, could be extolling the nutritional value of the food, such as high in calcium etc.)
8	Do labels carry claims that imply health or other benefits from feeding the products to babies and toddlers?
9	Do labels suggest that products are equivalent or superior to breast milk and/or homemade complementary foods?
10	Do you think these foods belong to the category of ultra-processed foods?

Data collection

Each focus group discussion lasted for 60–90 min and was moderated by the author. The author is a doctoral candidate with experience in conducting focus group discussions and personal interviews. Since the author herself is a mother, the participants felt at ease while discussing topics related to breast-feeding and child rearing in general. A semi-structured discussion guide prepared by the author was used to guide the discussion. It included questions relating to the concept of healthy food, participants' perceptions about the foods commonly advertised as healthy, cues they rely upon for evaluating healthiness of a certain food product, food shopping habits, use of nutritional information displayed on packages to judge healthiness and so on (Table 1). It was revised after pilot

testing with a group of 5 women respondents who qualified to be in the study sample. This follows from other studies in the past that have used similar methodology of focus group discussions for their qualitative exploratory studies [37, 42]. Open-ended questions explored their knowledge about complementary feeding, beliefs and family practices of the complementary feeding period. This explored topics including the type of foods offered, whether BMS was used, whether commercial complementary foods were fed to children and similar other topics apart from the antecedents of these attitudes and behaviours. Packages of commercial baby foods commonly available in stores in India (e.g. Lactogen, Nan Pro, Cerelac) were shown to trigger discussion about healthiness perception of packaged baby foods. The products around which these discussions were centered were positioned as safe and healthy in the Indian mind space and marketplace. The author also took notes while the discussions were in progress as it allowed her to drive the discussion in the right direction. Taking cues from her field notes, she was able to elicit responses and opinions from the participants. The study was approved by the Institutional Review Board (IRB) Committee of the author's institution.

Results

The discussions of all the sessions were transcribed using the software Google docs. Transcripts of the focus group discussions were analysed using content analysis. An inductive coding approach was used for this purpose. Using this approach, research findings emanate from the raw data when the transcripts are interpreted to identify recurrent themes and categories. This was done in Microsoft Word. A preliminary coding was done by repeated examination of the transcripts of the five focus group discussions. First, the main themes discussed in the focus groups discussion were identified. Thereafter, the categories of concepts within those themes were identified. This was validated by two other researchers who verified the codes and suggested modifications. Disagreements amongst researchers were resolved through dialogue so as to reach a consensus on the code. The codes were not discussed with the participants as their role was limited to participating in the focus group discussions only.

The demographic profile of the participants of the group discussions has been presented in Table 2. Obviously, this sample is not a representative of the overall Indian population but it was fairly representative in terms of the cultural and geographic diversity of the country. Women from 17 states participated in the study.

Content analysis revealed different themes and categories that are explained hereafter. This exercise allows us to achieve the purpose of conducting this research: [1] conceptualization of healthy processed food suitable for infants and children [2] perception of their healthiness, and [3] the actual feeding practices followed at home. The results have been summarized in Figs. 1, 2 and 3.

Conceptualization of healthy processed food suitable for infants and babies

Two major themes were identified in the discussion relating to participants' conceptualization of healthy food. One was characteristics of the food/food product and the other was characteristics of the individual consumer. Healthy foods were largely conceptualized in relation to discernible outcomes such as growth parameters.

Major theme emerging out of this exercise was food characteristics which led participants to determine whether a food is healthy or not. Within this theme, four categories were identified: fresh produce, specific elements, industrial processing and packaging and finally, outcome based. The same has been explained in Fig. 1. Participants associated food healthiness with freshness and less chemicals. Fresh fruits, vegetables, fresh dairy milk, homemade curd, fresh cut poultry and fish (as opposed to packaged/processed ones). The assumption was that since these are fresh, they are devoid of any artificial chemicals in the form of preservatives, additives, flavor enhancers and the like. Even within this category, they rated organic produce as healthier. While they rued the lack of convenient options for buying organic produce and lack of time to go to stores in their search, they felt satisfied that some online stores offer such options.

Organic foods are seen to be healthier as they are less processed as compared to their conventional counterparts, have no synthetic preservatives or artificial ingredients and are grown without the use of chemicals [43]. The baby food industry has a huge choice of brands and product offerings. This has increased diversity and availability of commercial baby food products and has also impacted consumer demand and their willingness to pay for them. This category of food items is often priced at a premium and yet has many takers as consumers believe they are critical for proper physical and mental development of their children [44]. The participants cited availability of fresh organic produce like vegetables, food grains, sometimes milk and ghee but were not very aware of the presence of organically produced infant milk products or food supplements. Some participants stated:

> *Organic is definitely healthy…because it is chemical free. (G1P3)*

> *Really…is it possible to have….say,…. organic Lactogen? (G3P8)*

> *We buy only organic vegetables….we make a trip to the supermarket every Weekend and stock up fresh*

Table 2 Socio-demographic characteristics of participants of the focus group discussions (*n*=51)

Characteristic	No. of participants	%
Gender		
Female	51	100
Age		
26-30	12	24
31-35	24	47
36-40	15	29
Educational level		
Professional graduate degree (viz. B.E./B.Tech./B.D.S./M.B.B.S/C.A./L.L.B. etc.)	21	41
Professional post-graduate degree (viz. MBA/MCA/CFA/MD/MS etc.)	30	59
Monthly take home salary of self (INR)		
50,000-75,000	8	16
76,000-100,000	13	26
100,000-125,000	15	29
126,000-150,000	11	21
151,000-200,000	4	8
Monthly household disposable income (INR)		
100,000-125,000	5	10
126,000-150,000	4	8
151,000-175,000	7	13
176,000-200,000	13	26
200,000-250,000	16	31
251,000-300,000	6	12
Geographical representation of participants		
Agartala (Tripura)	1	
Ranchi (Jharkhand)	1	
Jamshedpur (Jharkhand)	1	
Bhagalpur (Bihar)	1	
Patna (Bihar)	2	
Kolkata (West Bengal)	2	
Bhubaneswar (Odisha)	1	
Hyderabad (Telangana)	4	
Thiruvananthapuram (Kerala)	1	
Kochi (Kerala)	1	
Bengaluru (Karnataka)	5	
Mumbai (Maharashtra)	6	
Pune (Maharashtra)	2	
Ahmedabad (Gujarat)	2	
Vadodara (Gujarat)	1	
Jaipur (Rajasthan)	2	
Indore (Madhya Pradesh)	2	
Jabalpur (Madhya Pradesh)	1	
Delhi	5	
Noida (Uttar Pradesh)	4	
Gurugram (Haryana)	4	
Ludhiana (Punjab)	1	
Coimbatore (Tamil Nadu)	1	

organic vegetables for the week…but they don't have too many options…you know…only a small section of the supermarket stocks only 4–5 varieties of organic vegetables. That's obviously not enough! We need more varieties. (G4P2)

They also made frequent references to presence and absence of certain elements to denote healthfulness of the food products. Presence of antioxidants, beta-carotene, complex vitamins and minerals imparted a sense of healthfulness. Likewise, specific mention of absence of vice elements in the form of "no added sugar," "no added

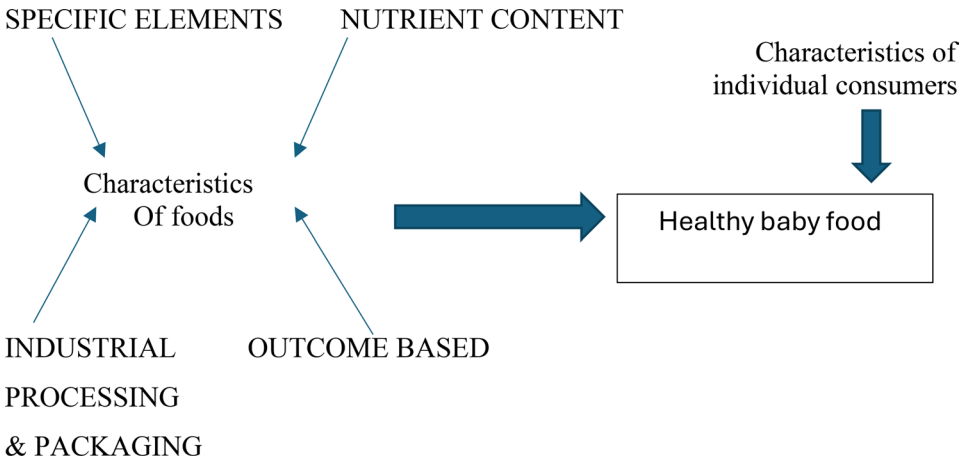

Fig. 1 Themes (upper case) and categories (sentence case) related to the conceptualisation of healthy baby food as identified in the thematic analysis of the focus group discussions

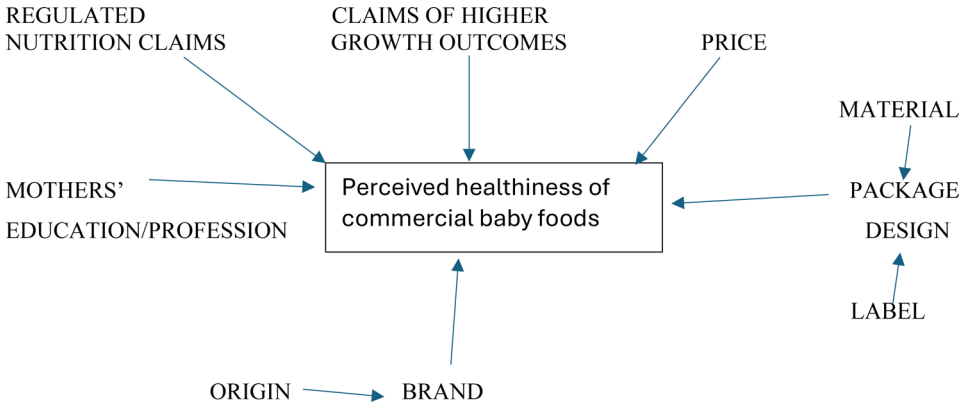

Fig. 2 Themes (upper case) and categories (sentence case) related to how participants perceived the healthiness of commercial baby foods as identified in the thematic analysis of the focus group discussions

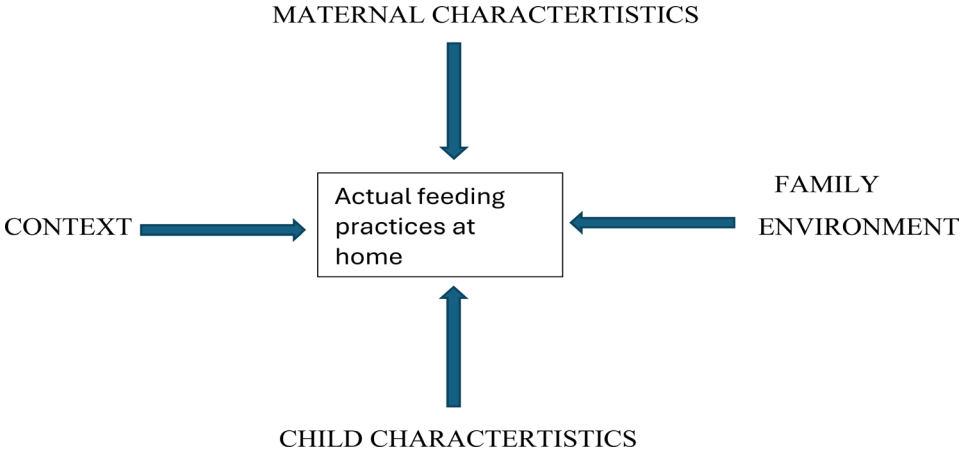

Fig. 3 Themes (upper case) and categories (sentence case) related the actual feeding practices followed by participants with respect to commercial baby foods as identified in the thematic analysis of the focus group discussions

salt," "zero cholesterol," "zero trans-fat," "gluten-free" and the like also signaled healthfulness of the product. A participant stated:

> *I am not technically very qualified to decipher all that is written on the label…besides, I don't have the time to go through all of that…or read about that…. but if I see a label like "no added sugar" or "no preservatives," that for me is healthy…. I pick that up. (G1P7)*

Industrial processing and packaging to increase the shelf life was cited as a concern by many participants. Many cited the use of additives, preservatives, flavor enhancers to be antithetical to the idea of healthfulness. While all participants checked the label for "use by" or "best before" dates, a few said that they avoided buying products with a high shelf life as that signifies use of excess preservatives. Especially for products that make the claim of "no preservatives added," such consumers check the shelf life. For instance, a few brands of fruit juices make this claim and yet boast of a shelf life of 180 days. Some consumers who are educationally and/or professionally qualified to validate or disprove such claims expressed their disappointment at such claims. They argued that such a long shelf life is impossible to achieve without adding preservatives and/or compromising the nutritional value of such products. However, even those who think such products are healthy, rated fresher products as healthier. For instance, many rated a freshly squeezed sweet lime juice as healthier as compared to the one sold by even premium brands. Some participants, however, believed that packed juice is healthier due to better hygienic practices and safety protocols followed during processing and packaging at the industrial units. Their confidence stemmed from the facts that they are licensed, compliant of regulatory protocols, undergo regular audits and have a greater reputational risk on account of any misadventure. They had similar views on the comparison between cow milk and formula milk for infants and toddlers. One participant stated:

> *When big companies like Nestle goof up with their products, like Maggi, there is a huge backlash. They immediately lose business and reputation. Imagine if they messed up with children's products, say, Cerelac! The impact will be much greater because this is about very small children's health….they would not want to be seen as unethical and lose all their business, especially now when all news reaches everywhere almost immediately! (G3P10)*

Most participants expressed concerns around packaging in plastic and/or aluminum based packaging. Most rated Tetra Pak based packaging to be safest for human consumption as well as environmental safety. They said healthy food has to come packed in healthy and safe packages.

Many participants believed that foods that yield healthy and satisfactory outcomes in terms of achievement of physical and cognitive milestones of the child are healthy. Food products signaling "increases immunity," "increases height," "increases bone density," "increases brain development" and similar outcomes are considered healthy.

While most seem to have a fair idea of what is healthy and unhealthy, they seemed to agree that healthy food is balanced food. Overconsumption of healthy food can have adverse health implication according to them. They cited ghee (clarified butter), milk, eggs, fish and meat as foods which if had in moderation are healthy but when had in excess can lead to obesity, high cholesterol and triglyceride. As one participant stated:

> *Ayurveda and modern science, both say that fats are necessary for babies and toddlers. It is good for brain and bone development. But if fed in excess, it will lead to obesity in adulthood…because the child would have been habituated to eating a lot of ghee right from infancy! (G5P11)*

> *Sugar as such is not very bad, but having lots of it, is not right. We don't need that much carbs. (G2P1)*

A lot of this knowledge, participants conceded, came from diverse sources such as their doctors, social circle, internet. Most also confessed that they indulged in unhealthy foods such as junk food, fast food, processed and packaged food occasionally and believed that such occasional aberrations would not lead to any significant health hazards. They also believed that children should also be exposed to all diverse kinds of foods as they may not always have access to home-cooked healthy food and hence they should be able to adjust to the changing food regime wherever they went in future.

Perceived healthiness of commercially available processed food products meant for infants

Regulated nutrition claims, claims of higher growth outcomes, specific reference to certain attributes and ingredients, price, brand, package design and mother's education/profession were the major themes identified during the discussions with regards to the cues guiding consumers' perception of commercially available baby foods. The same has been explained in Fig. 2. Regulated nutrition claims was identified as a major cue for evaluating healthiness of food. Most participants showed a preference for products making a regulated claim such as "fortified with Natural Vitamin K2," "no added sugar,"

"30% less sodium," "zero trans-fat" and the like. They did not have a very favorable opinion about products that did not make any such prominent regulated claim. As one participant stated:

I feed my child Nanpro as it has whey protein. (G3P4)

Likewise, many participants bought into the claims of better growth parameters such as height and weight, increased immunity and improved scholastic performance among others. While most were not completely convinced about the 100% accuracy of these claims, they believed they work better than not giving such foods. Another theme that came out prominently was specific reference to certain attributes such as "home-made," "home-style," "made by mothers," "recommended by doctors and certain ingredients such as "whole grains," "fresh fruits," "100% fruit, not extract". While a small section of participants, especially those coming from a food/FMCG background did not buy into these claims, a vast majority did. They felt such claims are very reassuring and gave them the confidence of feeding their children guilt- free without spending much time in the kitchen. As one participant stated:

I give Slurrp Farm banana powder as it helps in weight gain of the child. I really trust their products. (G4P2)

I prefer giving Slurrp Farm products to my baby as they are made by mothers. They understand our needs and deliver quality. (G4P2)

Some more aware participants believed that not all companies and brands reveal the percentage of each ingredient and simply mention their names. This could be very misleading because the brand could be riding on the back of a certain ingredient, which could be present in the entire recipe in a very minuscule proportion. They rued the lack of stringent regulations and demanded greater disclosures for more transparency. As for the next important theme, price, most participants agreed that price is a signal for quality. They believed that a higher price suggests superior quality of ingredients, adherence to safety and hygiene protocols in manufacturing facilities, certifications, lab testing and so on. Some of them believed this perception may not always be true. However, almost all agreed that lower price definitely denotes an inferior quality product. Some participants stated:

More expensive means more healthy. (G5P7)

More expensive may not always mean more healthy....but cheap prices definitely mean poor quality. (G2P6)

Just walk around the shelves in the supermarket... you will seldom find heavy discounts on quality stuff...they are always pricy...If they put a food product on heavy discount...then there is something definitely wrong with it...they just want to get rid of the stock. (G3P5)

Most participants believed that for formula feed, tried and tested brands work best for them and they would not be very trusting of a new upcoming brand. A fair chunk of these participants believed that they trusted brands coming from pharma companies over those from the Fast Moving Consumer Goods (FMCG) industry. They reported preferring western Multinational brands to Indian ones. Many were not aware that even Indian companies (such as Amul) has an infant milk substitute (Amulspray). When asked if they would consider buying it next time instead of NanPro, most responded in the negative. Clearly this signaled greater trust in western brands. A participant said:

In India, we do not have very high standards for food production and processing....We are still a developing country. Why would I risk my child's health by going for an Indian baby food brand when I have safer options available? (G2P7)

Many participants, however, also conveyed their openness to experiment with newer brands in the toddler snack segment. They believed their choice would be contingent upon other antecedents such as regulated claims, ingredient disclosure, packaging design and price among others.

Package design emerged as a theme during discussions. Most participants confessed that they do not read the entire list of ingredients and nutritional facts presented on the label, usually in small fonts, but they use the front of packaging label design as a heuristic for determining the healthiness of the product. They also believed that they were not equipped to interpret these facts and hence relied on other cues. Use of natural foods or sources thereof such as fruits, vegetables, milk, cow and the like convey a sense of healthiness. A small section of participants also said that they were influenced by the packaging material of these foods. A package that displayed it is made of recyclable or bio-degradable material elicited a favorable perception about the food contained therein. They felt that if the company was being responsible towards the environment, it would certainly be responsible towards the food that it sold and the health of its consumers. One participant stated:

If the company cares for the environment, it definitely cares for human health. (G1P5)

Finally, the educational and professional background of the participant seemed to play a critical role in how healthy or unhealthy they perceived commercial baby foods to be. Those with an educational and/or professional background in agriculture, food technology, FMCG, Pharma perceived all processed and packaged food as unhealthy and dismissed the nutritional or health claims of these food companies as marketing gimmicks. They believed that most claims made by companies regarding improved physical and cognitive outcomes are to be taken with a pinch of salt. One of them with a background in FMCG stated:

Food companies know that parents, especially those who can afford, will do anything in their capacity to provide the best nutrition to their children. These young parents today are much more aware and informed….and companies just cash in on that. For example, parents know that brain development happens rapidly till the age of 5. So if a product campaign is designed around this theme, such parents are more likely to take cognizance of these products that sell the idea of faster brain development through their product. So, basically, these companies tap into the parents' psychology, you know. (G1P10)

The other majority which did not share this background were much more accepting of these claims and had a more favorable perception of such foods.

A few participants who have an educational or professional background in the food, pharma or FMCG industry however were skeptical to these tall marketing claims of healthfulness and believed that processed and packaged foods are just as bad for babies and toddlers as they are for adults.

Some participants who had a sedentary job voiced their concerns over the use of processed and packaged foods. They felt that children are not as active as they were in the earlier times and that they spent more time glued to the internet than out in the playground. They felt feeding packaged foods will trigger the disease onset because once children develop a liking for these foods, they may not like anything else. One participant stated:

I sit in office all day. Being a working woman, I haven't really been able to do effective meal planning and rely a lot of outside food and processed food. Of late, I have developed hypertension and diabetes. I fear this may happen to my young children too, if I feed them processed food. They are packed with nutrients…true…but also have excess sugar and fats! (G3P8)

Some participants believed that choosing commercial baby foods signals progressiveness and departure from traditional norms. This confirms what other researchers have found that choosing commercial baby foods is also seen as a symbol of modernity [45]. One participant said:

Even my house-help gives Lactogen to her child and buys diapers for him! (G4P6)

Overall, most participants did not think of commercially available infant and baby foods such as BMS and/or formula milk, baby cereals, complementary nutrition in the form of nutrition and health drink, protein and health bars as unhealthy or highly processed. They saw them as healthy substitutes or as healthy supplementary feeding options which will tackle any nutritional deficiency that might arise by feeding only home-cooked food.

A few participants felt that having too many options makes it difficult for them to process all the information given on the label. Hence, they make their purchase decisions using cues such as brand, regulated claims, pictures and price, among others. However, many participants also felt that it is good to have multiple options as that fosters competition and pushes companies to do better and come up with the highest quality products.

Actual feeding practices followed at home

Maternal characteristics, child characteristics, family environment and context emerged as prominent themes during the discussions. The same has been explained in Fig. 3.

All participants agreed that infants and toddlers should be primarily fed mother's milk and, fresh and natural foods, and home-cooked food. But, they did not have a negative opinion about safe baby foods. While they understood that these foods are processed or ultra-processed, they still saw them as healthy options. Most participants themselves reported having been fed formula milk, nutrition powder, instant noodles and biscuits in their early childhood and did not agree with "demonizing" these products now, when they felt that "safety standards are much higher."

Most participants revealed that they have fed their child commercial baby foods at some or many points of time. Maternal characteristics emerged as the most frequent theme during discussions. The most common reason cited for giving formula milk was mother's insufficient milk production. Mothers felt guilty that they had not been able to satiate their children's hunger and had to resort to BMS. Many mothers fed formula milk to their children because they had to return to work and

expressing and storing breast milk was seen as a tedious and time consuming exercise. As one participant stated:

> *After a hectic day at work, I have no energy left to express milk. Giving a bottle is easier for me and my child both. It is fuss free. (G2P3)*

Many of them could not figure out the right technique of breast feeding and hence preferred switching to formula milk to avoid further fuss and stress. Child characteristics came up as a theme during discussions. Some participants shared that their children had problems latching on for feeding and struggled to breast feed while they comfortably sucked formula milk through bottles. After a few attempts to get their children to breastfeed, mothers gave in to children's preferences. Some participants with children having some medical conditions such as Gastroesophageal reflux (GER), autism, chronic diarrhea, certain allergies reported being extremely cautious about choosing foods for their babies. They avoided processed health foods as much as they could. If they did, they read the label including the list of nutrients and nutrition table thoroughly before buying. As one participant stated:

> *My child was a preemie and suffers from GER. I am very careful with what I feed her. It is mostly fresh homemade food like purees, sathamavu, sprouts and other such things. (G3P5)*

Participants also felt that they were not averse to the idea of feeding them to their children as they are not as "terribly dangerous" as they are made out to be and that even the freshest produce in our kitchen today is loaded with chemicals and antibiotics despite all the claims that their sellers or manufacturers make. They believed they impart the necessary nutritional balance that may be otherwise missing from the normal diet.

The immediate environment of mothers also plays an active role in their decision making process. Many participants cited pressure from family members, especially mothers and mothers-in-law to introduce formula milk because the child continued to cry even after being fed mother's milk. The elderly women believed that the child cried due to hunger and therefore needs to be sufficiently fed with formula milk. Once formula milk is introduced to these infants, they start weaning away thereby further increasing their dependence on artificial foods. So, a lot of times, new mothers cited family pressure and caved in to the elders' demand to feed formula milk to the child. While they resisted the idea of feeding artificial formula having added sugar, vegetable oils and other artificial additives, they gave in fearing nutrient deprivation of their child. Those who left their children in day care centers believed that caregivers insisted on formula milk and other readymade foods such as cereals (e.g. Cerelac, Ceregrow) because of convenience and less fuss as children also like their taste. Some participants said that their colleagues or friends advised them to not make the child dependent on the mother for feed but instead introduce commercially available safe products early on. This would allow the mother to focus on her career/other chores without having to constantly feel pressurized to feed the child. Besides, this would also equip the child to adjust to external environment once it starts socializing and interacting with the world. They argued it would build better immunity as the child's gut would have adjusted better to outside food early on. A good number of respondents reported having a vegetarian diet. They were concerned about protein deficiency in their children and hence preferred supplementing their children's diet with commercial foods they deemed healthy. As one participant stated:

> *Someone had told my mother that bottle-fed children are chubbier. Since she corelated chubbiness with good health, she made me feed her Nanpro. even though I was able to breastfeed. (G5P9)*

Most participants revealed that they read the package label before buying the baby food product. When asked to specify what they read, almost all said they read the "best before" or "use by" date on the label. Also, they admitted to getting influenced by the health halo created by catch phrases such as "no added sugar," "organic," "rich in nutrients X, Y,Z" and the like.

As stated earlier, participants were at a fair level of understanding about healthy foods and could distinguish between healthy and unhealthy foods on a broader level. Some perceived packaged infant and toddler milk and complementary food as healthy while others considered them as unhealthy. Yet, even those who considered them unhealthy and avoided feeding them to their child, did so in certain situations. For instance, when traveling out of town, they carried formula milk, baby cereal, cookies, wafers, sweets and savories as they are convenient and easy to carry. As one participant stated:

> *My husband and I love travelling and we have continued to travel even after our daughter was born. We feed her formula milk, Cerelac, chocos, cornflakes and so on as it is hassle free to carry them and my child likes the taste too. (G4P8)*

Many participants conceded that they feed packaged foods like formula milk, baby cereals, made for infants and toddlers snacks because other mothers in their social circle do so. Conversation with their peer group invoked a fear of missing out on child's nutritional requirement in them. In such conditions, they preferred to resort to

products and brands that claim labels like "organic," "made by mothers," "home-made" and the like.

Discussion

This study provides further insights into what professionally educated and well earning mothers think about healthy food, how they look at packaged and processed baby food and what their actual behavioural practices are with regards to this food category. It builds upon previous research and adds new dimensions. The data presented and the findings reported are consistent with each other. We have outlined the major as well as minor themes in our study thereby bringing about greater clarity in the findings. The discussion points to the concept of food healthiness in relation to the characteristics of the food product itself. A certain food is healthy if it is fresh, has the right mix of healthy ingredients, provides essential nutrients, does not have harmful or undesirable ingredients and aids body functioning and growth of babies, toddlers and young children. However, they conceded that they are not fully equipped to decipher product labels on account of lack of skills and time to acquire that skill. This lack of perceived self-efficacy has been found to reduce the impact of package label information on purchase decisions [46]. Besides, they judge these foods as healthy based on the several cues discussed earlier such as packaging, regulated claims, presence/absence of specific ingredients and the like. Discussions revealed that consumers find fresh unprocessed food as healthy. They do not brand all processed baby food as necessarily unhealthy. In fact, they see them as healthy options necessary to supplement their child's nutrition, provide them a balanced diet and make it easier and more convenient for them to manage work and home. While some had compulsions of feeding these commercial baby foods to their children, many did it voluntarily for various reasons explained earlier. This finding conforms to the reports that say that the baby food market has been on a growth trajectory in India, with baby formula milk registering the fastest retail current value growth of 15% in year 2021 [34]. The baby food market is poised for a healthy growth over the next five years [34]. Hence, there is a greater need for better regulation of this space because even the most educated parents are not able to interpret the labels. Misleading claims or claims that obfuscate other facts need to be regulated. There are instances where a product label states "zero trans facts" but on checking the nutritional facts, one finds that it contains saturated fats, cholesterol, a fact that has not been highlighted alongside the regulated claim of "zero trans fats." Food labels are a critical vehicle for conveying product information and influencing perceived quality and driving purchase intention [47]. They contain a huge variety of textual and pictorial cues to convey health related associations [48], which may lead to a perception of greater healthiness of a certain food product when that is actually not true [49]. References to home-cooked food, traditional food, specialization, art or nostalgia evokes a positive sentiment in the consumers' mind and reinforces an impression of healthfulness [50]. Consumers are lured by such labelling [51]. They are misled by this impression of healthfulness as this perception tends to override the objective information about the nutritional composition of products [52].

While the developed countries have had statutory bodies to regulate their food industry and safeguard consumers' safety and well-being in existence for a long time, India got one very recently in 2008. The Food Safety and Standards Authority of India is the statutory body governing food safety. It allows companies to make a "0% trans-fat" claim even when the food product has less than 0.2 gm of trans fat per serving. Similarly, they can claim "saturated fat free" when the saturated fat does not exceed 0.1 gm per 100 ml of food [53]. Lack of proper and accurate knowledge leads to poor interpretation of these claims thereby leading to consumers drawing incorrect conclusions. Often, nutrition claims like "rich in a certain mineral/vitamin" or "no added sugar" underplay the nutritional composition of the food as a whole thereby leading consumers to make incorrect judgements about that product. Many such products have an excess of saturated and/or trans fats, sodium and/or sugar. However, this information gets obscured due to the health halo created by misleading nutrition claims.

Disclosure of ingredients by percentage of the total food composition is not mandated in India. The names of ingredients used in the product are required to be listed in descending order of their composition. This makes it difficult for consumers to get access to precise data about the composition of their food product. Purchase decisions, therefore, are not well-informed.

Conclusion

Results from this research suggest that several cues, rather than hard objective information present on the package label or otherwise available in public domain, play a critical role in shaping up professionally qualified and well earning mothers' conceptualization of the healthiness of commercial baby foods, the perception of their quality and the actual dietary practice they follow for their children. These results point out to the need to follow a multi-pronged approach where the policy makers tighten the regulatory bodies and come up with effective awareness campaign and makers of these foods come clean about their formulations in a decipherable manner as well as create formulas with better and safer ingredients.

This research focused on a small segment of the Indian population in line with its objectives. So naturally, this sample is not representative of the entire population of the country. Hence, a study that has a more representative sample may be conducted to understand how their understanding of the concept of healthiness and perceptions about the healthiness of commercial baby foods differs from our sample. However, because this segment itself is educated and well off, we do not expect the research findings to significantly deviate a lot if the same study is conducted for a more representative sample. This study deals with a global problem and therefore, is likely to have implications for the global fraternity, especially on the policy framework side. Extant literature suggests that barring countries and cultures where a lot of value is placed on cooking at home [54], higher consumption of commercial baby foods is prevalent almost everywhere else, going as high as 65% of the total food intake of the child [55].

Abbreviations

WHO	World Health organization
BMS	Breast Milk Substitutes
RDI	Recommended Dietary Intake
FMCG	Fast Moving Consumer Goods

Supplementary Information

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Supplementary Material 1

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Author contributions
single author paper.

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Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The surveys were conducted according to established ethical guidelines, and informed consent was obtained from the participants in the online focus group discussions. The study was cleared by the Institutional Review Board, Indian Institute of Management, Ahmedabad.

Ethical disclosure
This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Institutional Review Board at IIM Ahmedabad (IIMA IRB 2022-48). Written informed consent was obtained from all subjects.

Consent for publication
Yes.

Competing interests
The author declares that she has no competing interests.

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