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Community Perception and Acceptance of Micronutrient Fortified Complementary Food in Integrated Child Development Services (ICDS), Gujarat, India

Research Article

Nakkeeran N[1], Chaturvedi A[2], Bhagwat S[3], R Sankar[4] and Patel R[5]

[1]*Indian Institute of Public Health Gandhinagar, Sardar Patel Research Campus, Drive-in Road, Thaltej, Ahmedabad-380054*

[2]*Public Health Foundation of India, ISID Campus, 4 Institutional Area, Vasant Kunj, New Delhi-110070*

[3]*Global Alliance for Improved Nutrition, Suite 15 AB, TheLodhi, Lodhi Road, New Delhi- 110003*

[4]*Global Alliance for Improved Nutrition, Suite 15 AB, TheLodhi, Lodhi Road, New Delhi- 110003*

[5]*Indian Institute of Public Health Gandhinagar, Sardar Patel Research Campus, Drive-in Road, Thaltej, Ahmedabad-380054*

***Corresponding author:** Dr. N. Nakkeeran, Indian Institute of Public Health Gandhinagar, Sardar Patel Research Campus, Drive-in Road, Thaltej, Ahmedabad-380054, Fax: 91 79 40240445, Ph: 91 79 40240444; E-mail : nnakkeeran@gmail.com

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Abstract

Background: Fortification of complementary food is seen as a potent intervention to address child malnutrition. Government of Gujarat introduced Balbhog; an extruded fortified blended "a pre-cooked, cereal-based supplementary food in powder form", to promote complementary feeding in 2007-08.The study aimed to understand community perception, acceptance and practices associated with Balbhog.

Methods: The study used Focus Group Discussions for data collection involving mothers feeding Balbhog to their 6-36 months old children and in-depth interviews with women who were non-users. Data were collected from four districts, representing four of the six regions of Gujarat.

Results: The study found that Balbhog was acceptable to most women and their children. Women had a strong recall about the product and its ingredients. Many caregivers attributed possible improvement in children's appetite and weight gain to the product. Quick preparation time and ease in cooking were other reasons for acceptance. Balbhog was being made available but often not in stipulated quantity and mothers were not aware of their entitlement. The frequency of feeding differed across caregivers. The common practice was to feed children on demand. Targeting the product to under-three year children emerged as a challenge. Often the product was not perceived as 'ready-to-eat' instead caregivers improved the preparation by adding additional ingredients. The quality of the product, preference for homemade food and a perception that Balbhog is meant for poor were barriers highlighted by non-users.

Conclusion: Acceptance and usage of Balbhog depends on product features, its availability, ease in preparation and social evaluation of the product. There is a significant scope to improve the availability of the product within the entitled amount. There is also a need for nutrition counselling on Balbhog to improve its initiation at appropriate age, improve consistency, frequency and quantity of its feeding and focusing the feeding to targeted age groups.

Keywords: Micronutrient fortification, Complementary feeding, Qualitative method, India

Introduction

Traditional complementary foods provided to children in the age group of 6-36 month are most often cereal based [1] and dietary lipids, proteins and micronutrients such as iron, zinc and calcium are low in these foods [2]. Bioavailability of such micronutrients in cereal based diets is usually low [3]. A national level survey has shown that among children of 1-3 years age group the average daily intake of cereals, millets, pulses, green leafy vegetables, milk and milk products, fats and oils in India is significantly lower than the Recommended

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Dietary Intake [4].Given these facts the nutrient and energy density of complementary food have to be increased to meet the requirements of children in 6-36 month age group. Fortification of staple food grains like wheat and rice is not a suitable strategy as the quantity consumed by children of this age group is too small to provide the required level of micronutrients [1]. For instance, NFHS-3 showed that only 41 percent of the 6-23 months old children are fed semi-solid foods adequate number of times in Gujarat and appropriate feeding practices are followed for only two out of ten children [5]. For these reasons fortified complementary food is being seen as a potent intervention in developing countries to address child malnutrition [1,3,6,7].

Studies from a number of developing countries have shown that, among selected groups, fortified complementary feeding, either alone or in association with other interventions has positive effect on improving micronutrient status, anaemia status [8-14], height [11] and underweight [12]. In addition, these literature have also pointed to a number of behavioural, cultural and logistical issues such as frequency of feeding, acceptance, social values attached to foods, palatability, cost, ability or willingness to purchase, packaging, preparation and the extent to which these foods replace other traditional complementary foods [2,3,13]. These issues have strong implications for success and effectiveness of such programs [15] and are yet unexplored in different contexts in which fortified complementary foods are being introduced.

In the following pages we present findings from a qualitative study to understand community perception, acceptance and practices associated with a micronutrient fortified complementary food, distributed in the name of Balbhog.

Balbhog was introduced in 2007-08 by Government of Gujarat at scale after an initial pilot project supported by UN-World Food Programme (WFP) and Global Alliance for Improved Nutrition (GAIN). It was introduced as part of supplementary nutrition program under Integrated Child Development Services (ICDS) for children in the age group of 6- 36 months and delivered through a network of anganwadi centres (AWC) by anganwadi workers and helpers. Balbhog is a specifically formulated pre-cooked, cereal-based micronutrient fortified food in powder form [16] made from wheat, pulse flour, edible oil, sugar, defatted soybean and enriched with eleven essential macro and micronutrients (Table 1). Seven, five hundred grams packets are provided per month to all under-three year children enrolled in AWC while ten packets are provided to severely malnourished children. The product is expected to meet 33 percent and 50 percent of energy and micronutrient requirements respectively of under-3 children.

The government supports complementary feeding program by celebrating *Annaprashan day* which encourages timely initiation, optimum feeding and monthly demonstration of preparation and feeding of Balbhog to children in the age group of 6 to 9 months. The guideline recommends use of Balbhog but it does not emphasize Balbhog as the only complementary food and encourages diversity in complementary foods [17].

The objectives of the study were to (a) Understand perceptions of beneficiaries on Balbhog (b) Bring out associated practices pertaining to use of Balbhog and (c) Understand consumption pattern of Balbhog.

Table 1: Composition and nutrient content of Balbhog.

Ingredients	Balbhog (125 gm)
Wheat	50 g
Defatted Soyabean	10 g
Bengal gram (pulse flour)	15 g
Sugar	35 g
Edible oil	15 g
Protein (gram)	12 – 15
Energy (Kcal)	500
Micronutrient Fortification	
Iron (mg)	6
Vitamin A (mcg)	200
Calcium (mg)	200
Thiamine (mg)	0.30
Riboflavin (mg)	0.35
Niacin (mg)	4
Vitamin C (mg)	15
Free Folic Acid (mcg)	15

Materials and Methods

Selection of participants

Four districts, Surat, Patan, Dahod and Jamnagar representing four of the six regions of the state were randomly selected from districts grouped in to regions. From each district two rural and one urban ICDS projects were randomly identified and subsequently villages were randomly selected from the district list of AWCs. Mothers of 6-36 months aged children were purposively recruited. Participants representing different settlements as well as major caste and religious communities including scheduled caste, scheduled tribe, and urban poor families. Non-users of Balbhog too were purposively identified and interviewed.

Data collection

In each district four focus group discussions (FGD) with users and three in-depth interviews (IDI) with non-users of Balbhog were conducted. Altogether 16 FGDs and 11 IDIs were conducted. Discussion guides and interview schedules for FGDs and IDIs respectively were designed, piloted and the final version of the guides were then translated in to the local language.

Data collection was done by a team of six Gujarati speaking researchers with training in Food and Nutrition or Public Health. A transect was used to identify an appropriate location that was relatively more accessible to participants, spacious and neutral for conducting FGD. IDIs were conducted at participants' home. Participants were provided with information on the study and an informed consent was taken. The discussion guide was used but in a flexible manner. An

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interview guide was used for this purpose. Both FGDs and IDIs were audio recorded along with manual note taking.

Analysis

The process of analysis began immediately after data collection. At the end of each FGD debriefing, reviewing and completion of manually written notes were done. Important aspects discussed in the FGD, logistic and methodological problems faced, map and food-chart drawn were discussed and noted. Further, after completing FGDs in one district the transcripts were heard to take forward the learnings to conduct FGDs in the subsequent districts. Audio recordings were verbatim transcribed, corroborated with written notes, translated in to English and assigned in to Atlas-ti 6.2.28 for analysis. 'Framework analysis' [18] approach was used for analysis of data. Two of the researchers who were involved in data collection did the analysis. After familiarisation of FGD/IDI data a thematic framework was identified. The background characteristics of participants in different FGDs/IDIs too were considered for arriving at meanings of data wherever possible and relevant.

Results

Knowledge and perceptions on Balbhog, its availability and benefits

a. Awareness about the product: A majority of the women across four districts were aware about Balbhog and were able to identify, describe and differentiate Balbhog packets from other fortified take home rations (THRs) such as *sheera*, *upma* and *sukhadi*[13] (SUS) in terms of appearance of packets, contents, colour, taste, and granule size. Many members were also able to recall the composition of Balbhog such as flour, pulse flour and sugar:

"Balbhog is written on top of it", "… coffee colour lines and a picture is on top, a picture of mother and a daughter is there. "It is written on the packet that there is calcium", "vitamins, iron", "Bengal gram flour, sugar"

Some of the participants however could not differentiate Balbhog packets from other THR packets externally. It is also possible that for many, there was no need to differentiate between Balbhog and other THR products as they received both kinds and the contents were often used interchangeably.

b. Availability and Distribution of Balbhog: Availability of Balbhog was a major factor that shaped the extent of utilisation. People did not have to make efforts to obtain these packets as AWW would inform the eligible mothers about the arrival of supply who would then collect it from the centre. In some cases women shared that if they miss collecting the packets from AWCs, then AWW or her helper would deliver the packets at their home. However, there was no fixed day for distribution of Balbhog rather it depended on the arrival of supply at the AWC.

"If it comes today in balwadi (AWC) then immediately on next day they come to call us"

"If we are the only ones remaining to collect Balbhog packets, then she comes and gives us"

1 These are meant for pregnant and lactating mothers and adolescent girls

There were however variations in number of packets received by women both within and between districts. The FGDs revealed that women were not aware of the number of entitled packets and receiving these packets was often seen as a gesture of benevolence from AWW rather than as their entitlement. As a result they expressed gratitude even if they were given only half the numbers of the entitled packets. It also appeared that distribution seemed to be partly arbitrary with quantum of packets distributed varying between one month and the next depending on available stock and it also varied across families of similar entitlements. Some mothers pointed out that AWWs distributed packets on the basis of nutritional status of children.

"*Yes I get four packets*"

'If it is Balbhog they give 3 packets. If others have more children then they give us (less) 2 packets and if someone has not taken then they will give (those packets to) us saying 'take them as your child eats' "

"*Sometimes they give on the basis of weight (of the child)*"

"As our children are healthy and a few (others) are weak they tell us that those children need more … hence we take one and come"

c. Perceived benefits of Balbhog: Participants reported a number of benefits of Balbhog which could be grouped into four themes.

(i) Child eats well, gains weight, becomes healthy, and does not fall ill.

"Child's appetite increases, even weight increases". "… fever won't come"

"She was very thin. After starting Balbhog she became healthy"

"Weight will increase by Balbhog and not by Sitaram (locally available fried snack)*"*

"No disease will linger". "… and studies well".

(ii) It has nutrients and is nourishing

"It is good, it is good for the children because iron and all comes from it"

"They get vitamin which forms blood. It is good if they eat this instead of outside food"

"Remains healthy, would receive sufficient nutrition"

(iii) Child likes hence easy to feed

The general perception among women is that if a child eats happily without fuss then the product must be good and should be given to the child.

"This they eat without difficulty. If something else we have to feed forcefully. But with this (Balbhog), if we give this in a bowl along with spoon (child) will eat on their own".

(iv) Easy to prepare, saves time

Occasionally women also mentioned that Balbhog saves them the daily trouble of deciding on what to prepare for lunch, dinner or snacks. It was always an option. As everything is added into it, it is easy to prepare.

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The perceived benefits were also explored in the situation of supply of Balbhog being stopped. Many women expressed that if the supply is stopped, it may affect child's food intake; as the product has many healthy ingredients they will not be able to procure these for home-made product.

"It will make difference, children eats this every day and if we change what they eat daily then they will not eat"

Practices associated with use of Balbhog

The practices pertaining to Balbhog was studied under themes of preparation of food from Balbhog, additional ingredients used, age of introduction of Balbhog, frequency of consumption and intra-household distribution.

a. Preparation of food from Balbhog, including additional ingredients: Most women indicated that preparation of Balbhog was not a problem as it had all the necessary ingredients, came with clear instructions on how to cook and could be easily prepared using only boiling water. However, a majority of the women had expressed that Balbhog prepared in plain water does not come out well. Many had expressed that children preferred Balbhog when it is roasted in oil or ghee (clarified butter), cooked in milk, and sugar or jaggery (molasses) additionally added. It improved taste, consistency and makes it softer. However it added extra cost to the family and therefore a few women reported using only water.

"It does not come out good in plain water. Children don't eat, don't find it tasty"

"If we roast in ghee and add milk or water then children eat", "If we add sugar then it becomes sweet and children eat"

"As it is less sweet we have to add sugar or something in it"

It was noted that most women treated Balbhog as a snack and not as the main meal. Feeding Balbhog during lunch was perceived to spoil the appetite of the child for the main meal. In other words there is a lack of recognition of Balbhog as an ideal complementary food, which perhaps implied the need for enhanced nutritional counselling by AWWs. Women prepare d different recipes from Balbhog as instructed by AWWs and some experimented with traditional or new recipes on their own. A common response was that children also preferred to eat Balbhog in the raw powder form. The raw powder being sweet and granular, by adding a bit of oil, dry balls of Balbhog could also be instantly prepared and consumed.

b. Age of introduction of Balbhog: Many women reported that they initiated Balbhog after the child completed 6 months, as instructed by the guideline. There were however many cases where mothers initiated Balbhog much later.

"We started after 9 months"

"When he became one year old"

"I started when his teeth began to come out"

c. Frequency of consumption: Participants perceived that Balbhog was being used in most households and only a few households in their area did not use it. There were instances narrated of migrant families requesting neighbours to collect their share of Balbhog for use on their return.

Frequency of feeding Balbhog differed across respondents ranging from twice or thrice a day to once a week. Common practice was to feed it at least once in one or two days or on demand.

"Two times we feed powder (Balbhog) and rest is homemade food"

"Mine asks daily, frequently he asks, as he likes its taste"

"Not daily, have to prepare alternate day, don't eat daily"

"Prepare and give them whenever they feel like eating"

"Eats sometimes, don't eat daily"

Once the Balbhog gets prepared it tends to get thick and sticky very soon. To avoid wastage caregivers therefore prepared only the right amount that the child usually consumed or only after the child demands for it.

d. Intra household distribution: Within the family, targeting the product to children of specific age group was a problem. The Balbhog was often shared among all children and even among adult women although it was rarely consumed by adult men. The women found it difficult to prepare separate food for children and hence whenever a Balbhog preparation was made it was shared with all children in the family; likewise a child under the age of three was also fed with what was prepared for other grown up children in appropriate form.

"*Older children eat, whoever in the family likes, eats"*

"One is five years old, he also eats Balbhog"

"Men don't eat only all ladies eat"

Perceptions and factors affecting non-usage

In-depth interviews were conducted with non-users of Balbhog to find their perceptions and factors that influenced their decisions. Further, even among the users reasons for irregular or infrequent use were explored. While a few economically better off families had expressed that Balbhog is meant only for children of poor families, the latter had their own reasons for not using the product. In general, reasons adduced for low or non-use of Balbhog included poor state of the packets when it reached the beneficiaries, poor mouth-feel when it was prepared in plain water, poor taste or undesired smell, child refusing, or occasionally child having diarrhoea on consuming raw Balbhog, mother not knowing how to prepare it, not aware of the nutrient content of it and not having time to visit AWC to collect the packets.

"Sometimes it does not come in good condition and something might be in it and if we cook that and eat we may fall sick"

"Mine doesn't eat and I also don't prepare so we don't take it"

"As there is medicine in it, there is smell she does not eat"

"She gets diarrhoea hence it is better not to feed"

"Don't know, it was something to be prepared in water. As we would not understand anything, left everything"

"As we have eaten homemade one, we don't like all that, medicine

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and all is mixed in it"

"Why should (we) take and waste it when we don't require? … We don't bring we tell them that you give our packets to any poor person as mine does not eat … as they are poor and cannot afford to feed other things to their children hence if they prepare this and feed their children it will be good, they would not be getting fruits and all."

Another important reason cited is that the local cuisine had a number of other food items prepared from rice, wheat, or other coarse grains as the base with additional ingredients such as potatoes, grams, buttermilk and vegetables, given to children and that cannot be replaced by Balbhog.

"She eats homemade one but does not eat the one prepared from powder (Balbhog), eats dry powder only"

"Give milk, dal-rice, chapatti, vegetables boiled potatoes"

"Mine likes homemade one of semolina"

Discussion

The study has brought out community perceptions on the product, its availability and distribution, perceived benefits to children, practices associated with preparation, initiation, targeting, frequency of consumption, and factors leading to low or non-use of the product.

The women had a strong recall about the appearance of the package, colour and the product ingredients. Lack of appetite and the struggle to feed children is one of the major factors for poor feeding practices in children. The general perception among many caregivers is that if a child eats Balbhog happily then the product must be good and should be given to the child.

Many caregivers attributed possible improvement in children's appetite and weight gain to the acceptance of the product. The presence of vitamins and minerals in the product were also valued by caregivers as they were related by them to healthy growth of children. Apart from product features, ease in procuring and preparation, children consuming without much fuss and therefore saving caregivers' time were other reasons given by participants for acceptance of Balbhog.

The result of the FGDs showed that Balbhog was being made available but often not in stipulated quantity to all eligible families. The lack of awareness about the entitlement seems to be a major barrier and there is a need to make people aware of their entitlement and create demand on the ICDS system to deliver the recommended packets every month. Measures should be taken to reduce product damage in transition and storage at AWC as poor packet quality during distribution affected uptake of the product. A perception among selected sections that Balbhog is meant for poor was another factor contributing to its non-usage among better off households.

Balbhog was being reportedly used by women but the frequency of feeding differed across women ranging from daily to once in a week. The common practice was to feed children on demand. Similarly though many families initiated feeding of Balbhog by 7thmonth, among many women this was delayed till 9thmonth or later. Targeting the under-three year children in households emerged as a problem as Balbhog was often shared among other elder children and family members. As noted by an earlier study here too we find that providing fortified complementary food in conjunction with specific educational messages rather than alone may be more beneficial. Family members have to be sensitized on the importance of feeding Balbhog fortified with micronutrients. It is important to emphasise the right age to introduce Balbhog, regularity, frequency, appropriate consistency and quantity of feeding Balbhog, hygienic way of preparing the product and the need to avoid excessive displacement of breast milk while feeding Balbhog. The role of micronutrients in physical and mental growth and in prevention of anaemia in children needs to be stressed during interaction with women [19].

Although Balbhog is projected as pre-cooked and ready to eat product it is largely not being perceived so by the community. The results of the study showed that preparation of Balbhog in plain water did not come out well and hence caregivers had to improve it by adding additional ingredients like sugar, clarified butter, oil and milk. This not only improved the palatability of the preparation and brought it closer to the local cuisine in terms of taste and form but it also increased the energy density of the food. For many women this implies additional cost and they followed standard recipe of preparation with plain water. In other words, introducing small variations in preparations or increasing certain additions like oil and sugar in the pre-mix may further increase its acceptability as well as its effectiveness in addressing malnutrition.This also points to potential research possibilities of assessing the role of micronutrients vis-à-vis the energy rich additional ingredients in child's growth. Studies have shown that fortified milk-based or fat-based complementary foods yield promising results [20,21].

Though the product has a wider acceptance it is being given not as the only but one of the complementary foods along with a number of other homemade recipes. Balbhog was often seen as a snack given between regular homemade meals and not replacing that latter. Availability of a range of homemade foods that are affordable and acceptable to children compels one to explore the option of home-fortification that has been found to be acceptable in other contexts [15,22,13] as an alternative or additional strategy.There is a significant scope to improve supply related aspects. At the familial level there is ample opportunity for nutrition counselling to improve initiation of Balbhog at appropriate age, consistency, frequency and quantity of feeding, storage and focusing the feeding to targeted age groups to ensure a higher energy density of complementary feeding.

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