



An Exploratory Mixed Methods Study on Caregiver's Knowledge on Nutritional Requirement of Children Aged Six Months to Two Years

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Abstract

Introduction: Giving healthy balanced diet to children ensures that they are getting all the essential vitamins, minerals and other nutrients. Majority of the mortality and morbidity among children occur in the under 5 age group and one of the major causes of death is the malnutrition. Focussing on overall nutritional value of food given is more important than on any one nutrient or some of them. Hence the study was done to assess the mother's or direct care giver's knowledge on nutritional requirement of children aged six months to two years.

Methods: It was an exploratory mixed method design where qualitative (Using in-depth interview) method was followed by the quantitative (Using community-based cross sectional study design). A questionnaire was developed with items exploring the knowledge of caretakers of under 2-year children with the help of "In depth interview" technique among caretakers of a representative population. Questionnaire was also had details on socio-demographic variables and details on obstetrics and other health care seeking behavior of mothers.

Results: In-depth interview explored that caretakers and health care workers perspective on nutritional requirement for children aged 6 months to 2 years were mother's educational status, family income and number of family members / children and various customs and belief. In the quantitative phase, 58.9% caregivers of children received information on feeding from health staffs and about 83.3% of them introduced complementary feeding after six months of age. The knowledge on practice food diversity was also found to be adequate.

Conclusion: Health education to caretakers regarding importance of balanced diet with efficient use of complimentary feeding and use of diverse food items to generate interest of child is important.

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Introduction

Giving healthy balanced diet to children ensures that they are getting all the essential vitamins, minerals, and other nutrients for healthy growth and development. The adoption of the "Integrated Management of Neonatal and Childhood Illness" (IMNCI), an integrated approach by Government of India on WHO guidelines, has facilitated the increase in the level of care provided.¹ But studies suggest that improving the infrastructure and quality of care at health facilities will alone not be enough in the reduction of Under 5 mortality or morbidity.

Children belonging to different age groups have different nutritional requirements. Until six months of age, breastfeeding provides ideal nutrition for babies. After six months of age complementary foods should be started along with breastmilk.² A 5-year-old child's nutritional requirement is different from an infant's nutritional



requirement. Majority of the mortality and morbidity among children occur in the under 5 age group, one of the major causes of the death is the malnutrition.³

Knowledge of mothers towards feeding during illness also influences for less intensity of feeding, or abstaining from feeding, etc. In India feeding bananas and curd to a child in the rainy and winter seasons is thought to cause cold and cough. Cultural factors and taboos have powerful influence on feeding practices and eating patterns with young mothers.⁴ On the other hand, lack of knowledge regarding healthy food by the care providers results in consuming unhealthy diet, processed food, chocolates, pizzas, sandwiches and carbonated beverages by the children. Even parents are clueless and have little knowledge on their dietary requirement. Focusing on overall nutritional value of food given is more important than on any one nutrient or some of them. Up to two years scheduled feeding should be encouraged rather than on-demand feeding. Hence this study was done to assess the caretaker knowledge on nutritional requirement of children aged six months to two years.

Methods

The present study was a community-based study which was undertaken in the villages around Sri Manakula Vinayagar Medical College and Hospital, Madagadipet, Puducherry, India. It was an exploratory mixed method design where qualitative (Using in-depth interview) method was followed by the quantitative (Using community-based cross sectional study design). The study participants were mother's or direct care giver's who resided in villages near Madagadipet and have child aged six months to two years and also health care providers. The duration of the study was two months. In depth interview with care takers and experts like Anganwadi workers, Auxiliary Nurse Midwife, Female Health Worker, Paediatrician etc also was conducted to guide in the questionnaire formation. The interview was conducted by the Principal Investigator who was trained in qualitative research. The interview was conducted in a place and time convenient to the study participants which helps in maintaining the privacy and confidentiality of the participants. All the study participants were interviewed after obtaining informed consent in their local language. Each interview lasted for 40 – 45 minutes. All the interviews was audio recorded and transcripts was prepared verbatim in English. Codes was obtained from the transcripts, which was merged together to form categories. Later similar categories were merged to form themes. The sample size of 207 was calculated after considering the prevalence of infant mortality rate of Puducherry as 16%.⁵ The sample size was further inflated, considering 10% as non-response rate among the respondents in the local community. Thus, the final sample size was 227, which is rounded off to the nearest high figure

of 230 (calculated by Epi Info version 3.5.4). Households that have caretakers with children aged six months to two years was selected by simple random sampling technique. A questionnaire was developed with items exploring the knowledge of caretakers of under 2-year children with the help of "In depth interview" technique among caretakers and health care providers of a representative population. Questionnaire was also had details on socio-demographic variables such as caretakers's age, education, occupation, monthly family income and socioeconomic status. Details on obstetrics and other health care seeking behavior of mothers, caretakers trusted source of information on feeding her child and her level of exposure to media, any involvement in support groups and caretakers knowledge on complimentary feeding (Feeding of grains, roots, tuber, legumes, nuts, dairy products, flesh foods) and diversity of given food throughout the week.^{6,7} The time taken to assess the knowledge ranges from 20 to 25 minutes for each participant. SMVMCH Research Committee and Institutional Ethics Committee (human studies) (IEC No – EC/21/2020) clearance was obtained before initiating the study. Data was entered in the Epi info software version 7.2 and analysis was done using Statistical Package for the Social Sciences (SPSS) software version 24.0. Description of categorical variables was expressed in percentages and continuous variables was expressed in mean and standard deviation. Manual content analysis was done for qualitative variables.

Results

Total of 17 persons were interviewed, of which nine were mothers and grandmothers and remaining eight were health care workers such as Anganwadi workers, Auxiliary Nurse Midwife, Female Health Worker and Paediatricians. Sixteen codes identified from the in-depth interviews were grouped under nine broad categories. Later, these categories were grouped into two major themes (Measures to assess the adequate nutritional requirements and contribution of each food groups and factors that decide the dietary nutrition) [Table 1].

Table 1: Content analysis of caretakers and health care workers perspective on nutritional requirement

Themes	Categories	Codes
Measures to assess the adequate nutritional requirements and contribution of each food groups	Based on diet history	24 hr recall method - Food frequency questionnaire - Contribution of 5 food groups (milk products, meat, fruits and vegetables, Breads/cereals and fats)
	Clinical examination	- Signs and symptoms of underlying deficiencies includes - PEM (dry and scaly skin, recent weight loss or decreased appetite) - Vitamin A (dryness of skin, poor vision) - Vitamin B (lip ulcers) - Vitamin D (bowlegs, widening of wrist, beading of rib) - Vitamin C (oral or mouth ulcer) - Iron (tiredness, fatigability)
	Anthropometric measurements	Calculation of weight for height, weight for age, height for age, head circumference and mid upper arm circumference
	Laboratory investigation	Hb, calcium, vitamin D, urine sugar and albumin, stool sample for hookworm examination
Factors that decide the dietary nutrition	Sociodemographic factors	- Mother's educational status - Family income - More number of family members / children
	Cultural and social factors	- Some vegetarians do not take garlic and onion on religious grounds. - Religious customs and beliefs include Muslims abhor pork and Hindus beef. - Myths and taboos include concepts of hot and cold foods
	Medical factors	Children with developmental anomaly includes Cleft lip, cleft palate and cerebral palsy
	Accessibility and affordability to services	- Locally available foods / crop and its affordability - Accessibility to local Anganwadi and Maternal child health services
	Environmental factors	Hygiene and sanitary practices include proper cleaning of vegetables, fruits, clean water source and hand washing practices

Out of 90 caregivers, majority (92.2%) were mothers. More than half (62.2%, 67.8%) of them were of nuclear family and homemakers respectively. More than three fourth (80%) were

Hindu by religion. Majority (90%) of the houses had ≤ 2 children [Table 2].

Caregiver's knowledge on nutritional requirement of children

Table 2: Socio-demographic characteristics and Socio-economic status of caretakers and their children (N = 90)

Characteristic	Number (N)	Percentage (%)
Informant's relationship to child		
Mother	83	92.2
Grandparent	6	6.7
Father	1	1.1
Type of family		
Nuclear family	56	62.2
Joint family	32	35.6
Living alone	2	2.2
Religion		
Hindu	72	80
Muslim	13	14.4
Christian	5	5.6
Years of school and college education of caretakers		
≤ 10 years	23	25.5
> 10 years	67	74.5
Occupation of mother		
Not working / Homemaker	61	67.8
Currently working	29	32.2
Total no of family members		
≤ 5 members	65	72.2
> 5 members	25	27.8
Total no of children		
≤ 2 children	81	90
> 2 children	9	10

Table 3: Caretakers's knowledge on Infant and young child feeding (N = 90)

Characteristic	Number (N)	Percentage (%)
Source of information on feeding		
Health staff	53	58.9
Elders	15	16.7
Mass media & social media	14	15.6
Friends	4	4.4
Support groups	4	4.4
Diet preference		
Non-vegetarian	78	86.7
Vegetarian	12	13.3
Restriction in diet due to myths and taboos		
Avoids veggies (like brinjal, curd, garlic, onion, black gram & egg)	8	8.9

Avoids nonveg (like dry fish)	3	3.3
Packed food items (chips, cool drinks)	2	2.3
Nothing	77	85.5

Table 3 shows that out of 90 respondents, 53 (58.9%) received information on feeding from health staff. There is also restriction in diet due to myths and taboos such as avoiding veggies like brinjal, curd, garlic, onion, black gram and egg reported by eight of the caregivers.

As mentioned in table 4, out of 90 respondents more than three-fourth (83.3%) of them introduced complementary feeding after six months of age. Reason for early introduction of complementary feeding as stated by remaining participants were family members (especially elders) advice (40%), doctors' / health care workers advice (26.7%) due to poor weight gain of baby and poor milk supply (20%).

Table 4: Assessment of caretaker's knowledge on complementary foods (N = 90)

Characteristic	Number (N)	Percentage (%)
Age of introducing complementary feeding		
Before six months	15	16.7
After six months	75	83.3
Reasons for introducing complementary feeding before six months (N = 15)		
Doctors' / health care workers advice due to poor weight gain of baby	4	26.7
Family members (Elders) advice	6	40
Poor milk supply	3	20
Working mothers	2	13.3

Caretaker's knowledge on the five food groups that a child should have as a complimentary feeding as part of the infant and young child feeding has been assessed. The knowledge of feeding cereals / breads, pulses, dark green vegetables, egg / meat / fish / milk products and fruits, fats and sugar as a complimentary feeding were present in 86.7%, 71.1%, 67.8%, 85.6% and 74.4% respectively [Table 5].

Table 5: Assessment of caretaker's knowledge on diversity of food (N = 90)

Characteristic	Number (N)	Percentage (%)
Knowledge on feeding cereals / breads		
Yes	78	86.7
No	12	13.3
How many days in a week		
< 3 days	24	26.7

3 - 5 days	39	43.3
6 - 7 days	27	30
Knowledge on feeding pulses		
Yes	64	71.1
No	26	28.9
How many days in a week		
< 3 days	37	41.1
3 - 5 days	41	45.6
6 - 7 days	12	13.3
Knowledge on feeding dark green vegetables		
Yes	61	67.8
No	29	32.2
How many days in a week		
< 3 days	62	68.9
3 - 5 days	26	28.9
6 - 7 days	2	2.2
Knowledge on feeding egg / meat / fish / milk products		
Yes	77	85.6
No	13	14.4
How many days in a week		
< 3 days	26	28.8
3 - 5 days	23	25.6
6 - 7 days	41	45.6
Knowledge on feeding fruits fats and sugars		
Yes	67	74.4
No	23	25.6
How many days in a week		
< 3 days	54	60
3 - 5 days	26	28.9
6 - 7 days	10	11.1

Discussion

In-depth interview explored that caretakers and health care workers perspective on nutritional requirement for children aged six months to two years were mother's educational status, family income and more number of family members / children, some vegetarians do not take garlic and onion on religious grounds, religious customs and beliefs include Muslims abhor pork and Hindus beef, myths and taboos include concepts of hot and cold foods, locally available foods / crop and its affordability and accessibility to local Anganwadi and maternal child health services. However, in the quantitative phase, 58.9% caregivers of children received information on feeding from health staff. About 83.3% of them introduced complementary feeding after six months of age. The knowledge of feeding cereals / breads, pulses, dark green

vegetables, egg / meat / fish / milk products and fruits, fats and sugar as a complimentary feeding were present in 86.7%, 71.1%, 67.8%, 85.6% and 74.4% respectively. A qualitative study by Koneru G in Andhra Pradesh had explored from the interview by local paediatrician that children usually eat what their family members eat, and the parents influence their attitude towards health and hence it is important to establish a healthy attitude and proper eating behaviors right from childhood.⁸

The study done on determinants of nutritional status of pre-school children in Kolkata, India stated that in addition to safe drinking water, food and nutrition supplementation, increasing mother's literacy and giving empowerment to mothers in the decision making process will help in improvement of nutrition status of children.⁹

In the present study, the mothers with educational status > 10 years were 74.5% and 67.8% of mothers were not working / homemaker. Similarly study by Adhikari N et al in Nepal found that maternal education, maternal health services utilization, maternal knowledge and maternal autonomy were associated with infant and young child feeding practices. They also revealed that mothers with educational status secondary or above were 74.4 percentage and 19.2 % of mothers were not working / housewife.¹⁰

In the present study 83.3% of mothers introduced complementary feeding after six months of age. A study done by Biks in Northwest Ethiopia stated that 53.8% [95% CI 45.9, 61.7] of children were introduced to complementary feeding at their sixth month of age.¹¹ In contrary, a study done in Karachi showed knowledge attitude and practices of mothers regarding complementary feeding was poor in terms of quantity and quality and the commonest age of introduction of complementary feeding was before six months with readymade items as their first choice.⁴ Myths and taboos on food and vegetable intake is more prevalent in our study. Similar findings are reported in study done in rural Tajikistan.¹² A study done in Jodhpur among mothers of children aged between six months and two years showed that mothers had good knowledge on weaning and choosing nutritious complimentary food items.¹³ In our study the most common reason for early introduction of complimentary feeding was elder advice. A study done among Dutch infants says that younger maternal age, lower maternal educational level, absence or shorter duration of breastfeeding and parental conviction that the child always wants to eat when he / she sees someone eating were the reasons for early introduction of complimentary feeding and the consumption of non-recommended foods.¹⁴

We found that in our study there is good caregivers' knowledge on diversity of food. Whereas study done in Ghana showed low level of caregivers' knowledge on diversity of food.¹⁵ Another study done in Ghana regarding mother's knowledge

and attitudes regarding child feeding recommendations and complementary feeding practices showed that 10.5% of the children met minimum diet diversity score, 39.5% showed minimal meal frequency and 8.5% received minimum adequate diet.¹⁶ A study done in Nigeria stated that children who did not receive the minimum dietary diversity had higher odds for underweight than children who received the minimum dietary diversity.¹⁷ Berihu et al in Ethiopia found that knowledge on minimum food frequency among mother's were 85%.⁶

Conclusion

Most of the caregivers of children received information on feeding from health staff. The knowledge on practice of introducing complementary feeding after six months of age and knowledge on food diversity was found to be adequate. Health education to mothers regarding importance of balanced diet with efficient use of complimentary feeding and use of diverse food items to generate interest of child which in turn will help the children to have healthy growth and development and reduce malnutrition.

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Conflicts of Interest None

References

1. Students handbook for IMNCI [online]. WHO 2003 [cited 2020 Jan 24]; Available from: URL: www.sihfw.nrhmharyana.gov.in/Modules/Child_Health/IMNCI/Pre_Services.
2. WHO. Complementary feeding: family foods for breastfed children. Geneva: World Health Organization; 2000.
3. Narayan J, John D, Ramadas N. Malnutrition in India: status and government initiatives. *J Public Health Policy*. 2019 Mar;40(1):126-141. DOI: [10.1057/s41271-018-0149-5](https://doi.org/10.1057/s41271-018-0149-5) PMID: 30353132
4. Mohsin SS, Shaikh AS, Shaikh R, Haider N, Prakash A. Knowledge attitude and practices of mothers regarding complementary feeding. *J Dow Uni Health Sci* 2014;8(1):21-25
5. National Family Health Survey - 4 [online]. 2015-16 [cited 2020 Jan 24]; Available from: URL: https://nrhm-mis.nic.in/NFHS/Factsheet/State_and_District_Factsheets.
6. Berihu A, Abera GGB, Berhe H, Kidanu K. Mothers knowledge on nutritional requirement of infant and young child feeding in Mekelle, Ethiopia, Cross sectional study. *GJMR. Interdisciplinary* 2013;13(6)
7. Wang D, Shi Y, Chang C, Stewart D, J Ying, Wang Y. Knowledge, attitudes and behavior regarding nutrition and dietary intake of seventh-grade students in rural areas of Mi Yun County, Beijing, China. *Environ Health Prev Med*. 2013 Dec 18;19:179-186. DOI: [10.1007/s12199-013-0372-4](https://doi.org/10.1007/s12199-013-0372-4) PMID: 24347467 PMCID: PMC4019754
8. Koneru G, Rao NSS, Sai TSR. A qualitative study on dietary habits and nutritional awareness among school children. *J Community Health Manag*. 2019;6(4):105-12. DOI: [10.18231/j.jchm.2019.023](https://doi.org/10.18231/j.jchm.2019.023)
9. Bharati S, Pal M, Bharati P. Determinants of nutritional status of pre-school children in India. *J Biosci*. 2008;40:801-814 DOI: [10.1017/S0021932008002812](https://doi.org/10.1017/S0021932008002812) PMID: 18442431
10. Adhikari N, Acharya K, Upadhyay DP, Pathak S, Pokharel S, Pradhan PMS. Infant and young child feeding practices and its associated factors among mothers of under two years children in a western hilly region of Nepal. *PLoS One* 16(2):e0261301 DOI: [10.1371/journal.pone.0261301](https://doi.org/10.1371/journal.pone.0261301) PMID: 34914802 PMCID: PMC8675745
11. Biks GA, Tariku A, Wassie MW, Derso T. Mothers infant and young child feeding (IYCF) knowledge improved timely initiation of complementary feeding of children aged 6-24 months in the rural population of northwest Ethiopia. *BMC Res Notes* 2018;11:593 DOI: [10.1186/s13104-018-3703-0](https://doi.org/10.1186/s13104-018-3703-0) PMID: 30115114 PMCID: PMC6097428
12. McNamara K, Wood E. Food taboos, health beliefs and gender: understanding household food choice and nutrition in rural Tajikistan. *J Health Popul Nutr*. 2019;38:17 DOI: [10.1186/s41043-019-0170-8](https://doi.org/10.1186/s41043-019-0170-8) PMID: 31387643 PMCID: PMC6685270
13. Deepa, Dekyi, Kumari N, Choudhary P, Saini P, Yadav R, et al. Knowledge and expressed practice regarding weaning among mothers of children aged between 6 months to 2 years. *AJNER*. 2019 Oct-Dec;9(4) DOI: [10.5958/2349-2996.2019.00102.2](https://doi.org/10.5958/2349-2996.2019.00102.2)
14. Wang Lu, Grieken AV, Velde LA, Vlasblom E, Beltman M, Hoir MPL. Factors associated with early introduction of complementary feeding and consumption of non-recommended foods among Dutch infants: the BeeBOFT study. *BMC Public Health*. 2019;19:388 DOI: [10.1186/s12889-019-6722-4](https://doi.org/10.1186/s12889-019-6722-4) PMID: 30961551 PMCID: PMC6454678
15. Christian A, Marquis G, Colecraft EK, Lartey A, Sakyi-Dawson O, Ahunu B. Caregivers' nutrition knowledge and attitudes are associated with household food diversity

and children's animal source food intake across different agro-ecological zones in Ghana. *Br J Nutr.* 2016 Jan 28;115(2):351-60.

DOI: [10.1017/S0007114515004468](https://doi.org/10.1017/S0007114515004468)

PMID: 26560016

Akpabuyo area, cross river state Nigeria. *Springerplus.* 2016 Dec 5;5(1):2073

DOI: [10.1186/s40064-016-3751-7](https://doi.org/10.1186/s40064-016-3751-7)

PMID: 28018781 PMID: PMC5138178

16. Bimpong KA, Cheyuo EK, Abdul-Mumin A, Ayanore MA, Kubuga CK, Mogre V. Mothers' knowledge and attitudes regarding child feeding recommendations, complementary feeding practices and determinants of adequate diet. *BMC Nutr.* 2020 Dec 1;6(1):67.

DOI: [10.1186/s40795-020-00393-0](https://doi.org/10.1186/s40795-020-00393-0)

PMID: 33292706 PMID: PMC7706028

17. Udoh EE, Amodu OK. Complementary feeding practices among mothers and nutritional status of infants in