Knowledge, Attitude and Practices (KAP) of low economy status women regarding Complementary Feeding in Northern Punjab.

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Abstract

Mothers of 200 infants (6-12 months) belonging to low-socioeconomic families were interviewed with the aim to study the existing complementary feeding practices and overall nutrition knowledge among them. The anthropometric assessment was carried out for the infants and was compared with WHO standardized z scores for indicators like weight-for-length/height, length/height-for-age, weight-for-age, and BMI-for-age. The latter three indicators were found to poorly comply with the WHO standards. The association between a mother's educational status and nutrition indicators was tested with Pearson's correlation coefficient. It was found that where the overall nutrition knowledge of the mothers showed satisfactory results, a huge gap existed concerning the feeding practices. A high prevalence of cultural beliefs and myths were found to be associated with infant malnutrition. The dietary pattern of the infants was studied in detail using 24-hour recall method and food frequency questionnaire. Less than half of the sample conformed to WHO nutrition indicators like minimum meal diversity. The minimum meal frequency for the whole sample was 0.74 whereas the minimum acceptable diet was 0.094. With such feeding practices, fighting micronutrient deficiencies has become a major challenge in India. It is suggested that grass root level initiatives be taken to curb all forms of malnutrition, right from infancy.

Keywords: infant nutrition, infant feeding practices,taboos, z score, complementary feeding practices

INTRODUCTION

The term complementary feeding includes any food which is liquid, semisolid or solid, other than breast milk and infant formula which introduced to an infant to provide nutrients (Arulda, Khan and Hazra, 2010). The period from birth to early childhood is the "critical window" for ideal growth and cognitive development of a child (Rajesh and

Bhavana, 2016). When an infant reaches 4-6 months of age, the nutritional requirements increase to accommodate developmental needs, and milk alone is no longer sufficient for the same(Khadivzadeh and Parsai, 2004; Javalkar and Aras, 2018). Weaning is the process to diversify the diet of an infant to include food and drinks other than breast milk. The World Health Organization recommends target range for complementary feeding to be six to twenty-three months(Senarath and Dibley, 2012). Complementary feeding includes infant cereal, pulse, fruits, vegetable, milk, egg and unsweetened yogurt (Jani, Udipi and Ghugre, 2009; Arulda, Khan and Hazra, 2010). Mortality, morbidity and malnutrition in infants are directly or indirectly the contributing factors of poor complementary feeding practices (Sethi, Kashyap and Seth, 2003). During this transition period, infants are at high risk of nutritional deprivation, which may lead to malnutrition. Wasting and stunting, especially in low- and middle-income countries (Akinola, Opreh and Hammed, 2014; Shankar *et al.*, 2017) are due to the delayed introduction of complementary food (Sethi, Kashyap and Seth, 2003) and inadequate nutrient density (Vossenaar *et al.*, 2013). Small amount at meals, low nutrient density and restriction of certain foods of faulty infant feeding practices, cultural beliefs and taboos are also significant contributors of undernutrition in children(Bhandari *et al.*, 2004; Sabharwal, 2014). Sanitation and low admittance to safe water, in developing countries like India, show tremendous effect on health status of infants (Sinhababu *et al.*, 2010).

Despite uncountable attempts by international bodies to curb all forms of malnutrition and too early and late introduction of congruous complementary feeding lead to nutritional deficiencies like stunting and wasting. Numerous attempts by governments at national, regional and state level to popularize these attempts, a major fraction of Indian population still suffers from childhood health burden. This burden greatly affects the overall development of the country.

After formation and popularization of practices like exclusive breastfeeding and non-discarding of colostrum, it is right time that we target the social taboos existing in the country along with improvement in quality and quantity of weaning foods introduced to the child. Present study was undertaken with an objective to analyze the existing infant feeding practices, importance of demographic factors, link with maternal education status, existing cultural beliefs and most importantly, the nutrient adequacy of complementary foods provided to the child.

MATERIAL AND METHODS

Sample selection

Two hundred women from three districts namely, Jalandhar, Phagwara and Pathankot were randomly selected from northern Punjab. The respondents (interviewers) resided in an urban industrial area of Jalandhar city and rural

residents of Baknaur and Chaheru villages of Pathankot and Phagwara district respectively (Figure 1). Criteria for respondent selection and inclusion under the study were: a. Low socio-economic status; b. Mother of an infant with age between 6-12 months.

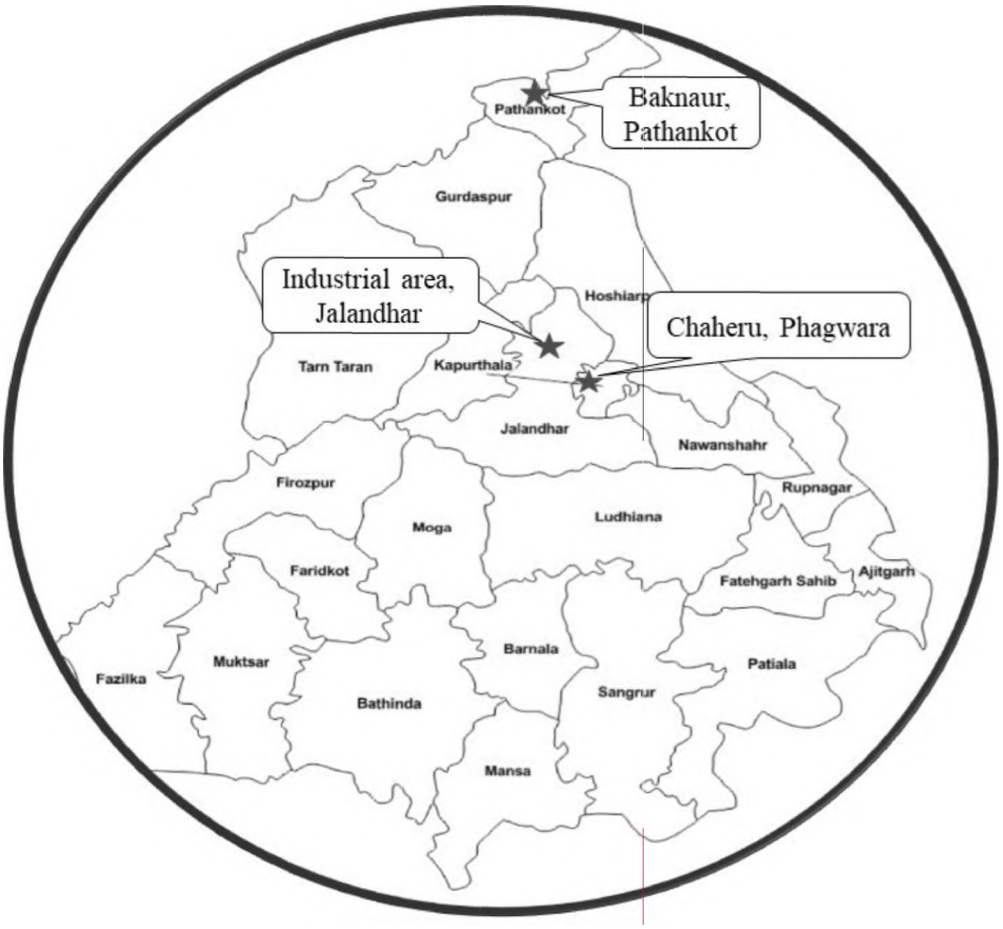


Figure 1. Map of Punjab representing study sites for sample selection.

Data Collection

Information from the respondents was collected through a pretested structured questionnaire. Informed consent was obtained from all the respondents. The questionnaire comprised of both open and closed ended questions. Socio demographic characteristic included information pertaining to age, the gender of infants, parents' education, mothers' occupation, type of family, type of household and land holdings. Anthropometrical measurement using height and weight of the infants was assessed by measuring tape and weighing balance. Dietary intake was assessed by 24-hour dietary recall method. Information was collected on the type of food groups usually consumed, quantity and time interval of feeding. The obtained data for different foods were classified into 5 groups namely cereals, pulses, milk and its products, vegetables, fruits and others. This method was chosen as an effective and viable way to estimate the routine intakes of the food, where mothers of the infants were asked to recall all the food groups and beverages and including amounts consumed during the 24-hour period of the previous day(Caulfield *et al.*, 2014).Routinely followed hand washing practices for infant feeding were also asked from the mothers. Mothers use different feeding methods for feeding infant like cup, spoon, bottle, hand and others, grinding, mashing, pureeing and cooking methods were used to prepare feed.

Statistical Analysis

Data were summarized using numerical descriptive statistics including number and percentage for data representation. The data was analyzed using SPSS (version 25.0, IBM SPSS, NY, USA). Mapping and stratified analysis of standard deviation (z) scores for weight for age (WAZ), height for age (HAZ), weight for height (WHZ), and body mass index (BMI) for age (BAZ) were obtained using the Nutritional Survey module of the WHO Anthrop software (3.2.2). Krona charts were used for the effective representation of exhibited dietary pattern.

RESULTS AND DISCUSSION

Demographics of the sample

Background information of infants along with the education status of parents, types of family, and landholdings are given in Table 1. Majority (69%) of the respondents work as minimum wage employees in the industries in the city or as domestic workers in private homes. More than half the parents were at least matric pass and lived in their own houses. It was also found that, like most Indian rural families, our sample also had most of them living in joint families. It was found that 72% of the mothers washed hands only with tap water without using any soap, before feeding the infant. This is a major finding as hygienic practices followed largely determine the immunity and health status of infants.

Table 1. Background information of the of study population

Variable	n (%)
Age of children	
6-9 months	90 (45)
10-12 months	110 (55)
Sex	
Male	102 (51)
Female	98 (49)
Mother's education	
Below 10th	60(30)
10th pass	42 (21)
12th pass	56(28)
Graduate	28(14)
Postgraduate	14 (7)
Father's education	
Below 10th	72 (36)
10th pass	62(31)
12th pass	40(20)
Graduate	10(5)
Postgraduate	16(8)
Mother's occupation	
Not working	158 (79)
Work from home	28 (14)
Full time job	14 (7)

Father's occupation	
Unemployed	0
Own business	44 (22)
Agriculture and related activities	18 (9)
Others (driver, mechanic, labor etc.)	138 (69)
Type of family	
Nuclear	86 (43)
Joint	114 (57)
Type of household	
Own home	112 (56)
Rented home	88 (44)
Landholding	
Yes	42 (21)
No	158 (79)
Hand wash practices*	
Water only	144 (72)
Hand wash/soap with water	56 (28)

*before feeding the child

Anthropometric indicators compared with WHO standards

Anthropometric assessments carried out for the study sample was compared with WHO standards. If we combine both the sexes, nearly half the percentage of sample for WHZ indicator were less than 3SD, indicating severe thinness. Only 3% of the male infants and 6.1% of the female infants had > +1SD for WHZ (Table 2). This is also evident by the distorted bell-shaped curved in Figure 2a. WAZ scores also showed similar trend with 71.4% of the male infants and 69.4% of the female infants in less than 2SD (Figure 2b). The HAZ score for the sample had an approximately normal bell-shaped curve with male infant population more shifted towards the left as compared to the female infants. The BAZ score for 4.5% of all the infants was more than 1SD and was less than 2SD for 57.6% of the infants (Figure 2d).

Table 2. Anthropometric variable of the experimental groups (6-12 months)

	N (%) < -3SD (95% CI)	N (%) < -2SD (95% CI)	N (%) > +1SD (95% CI)	N (%) > +2SD (95% CI)	N (%) > +3SD (95% CI)	Mean	SD
Males							
Weight-for-length/height (%)	36.4 (18.4%, 54.3%)	51.5 (32.9%, 70.1%)	3 (0%, 10.4%)	3 (0%, 10.4%)	0 (0%, 1.5%)	-1.93	1.83
Length/height-for-age (%)	2 (0%, 6.9%)	10 (0.7%, 19.3%)				-1.27	0.91
Weight-for-age (%)	53.1 (38.1%, 68.1%)	71.4 (57.8%, 85.1%)				-3.03	1.72
BMI-for-age (%)	36.4 (18.4%, 54.3%)	51.5 (32.9%, 70.1%)	3 (0%, 10.4%)	3 (0%, 10.4%)	0 (0%, 1.5%)	-1.9	1.86
Females							
Weight-for-length/height (%)	57.6 (39.2%, 76%)	63.6 (45.7%, 81.6%)	6.1 (0%, 15.7%)	0 (0%, 1.5%)	0 (0%, 1.5%)	-2.74	1.88
Length/height-for-age (%)	2 (0%, 7%)	2 (0%, 7%)				-0.56	0.91
Weight-for-age (%)	59.2 (44.4%, 74%)	69.4 (55.5%, 83.3%)				-2.92	1.74
BMI-for-age (%)	57.6 (39.2%, 76%)	63.6 (45.7%, 81.6%)	6.1 (0%, 15.7%)	0 (0%, 1.5%)	0 (0%, 1.5%)	-2.75	1.93

Both sexes combined							
Weight-for-length/height (%)	47 (34.2%, 59.8%)	57.6 (44.9%, 70.3%)	4.5 (0%, 10.3%)	1.5 (0%, 5.2%)	0 (0%, 0.8%)	-2.33	1.89
Length/height-for-age (%)	2 (0%, 5.3%)	6.1 (0.9%, 11.3%)				-0.92	0.97
Weight-for-age (%)	56.1 (45.8%, 66.5%)	70.4 (60.9%, 80%)				-2.98	1.72
BMI-for-age (%)	47 (34.2%, 59.8%)	57.6 (44.9%, 70.3%)	4.5 (0%, 10.3%)	1.5 (0%, 5.2%)	0 (0%, 0.8%)	-2.32	1.93

* Values are based on WHO standards.

For each indicator all children are included in the evaluation with a plausible z-score

"Percentages below median based on weight-dependent indicators are defined as <-3 SD or oedema, and <-2 SD or oedema. Oedema cases are not used to derive mean and SD of z-scores." %<-2SD includes %<-3SD; %>+2SD includes %>+3SD; %>+1SD includes %>+2SD and %>+3SD.

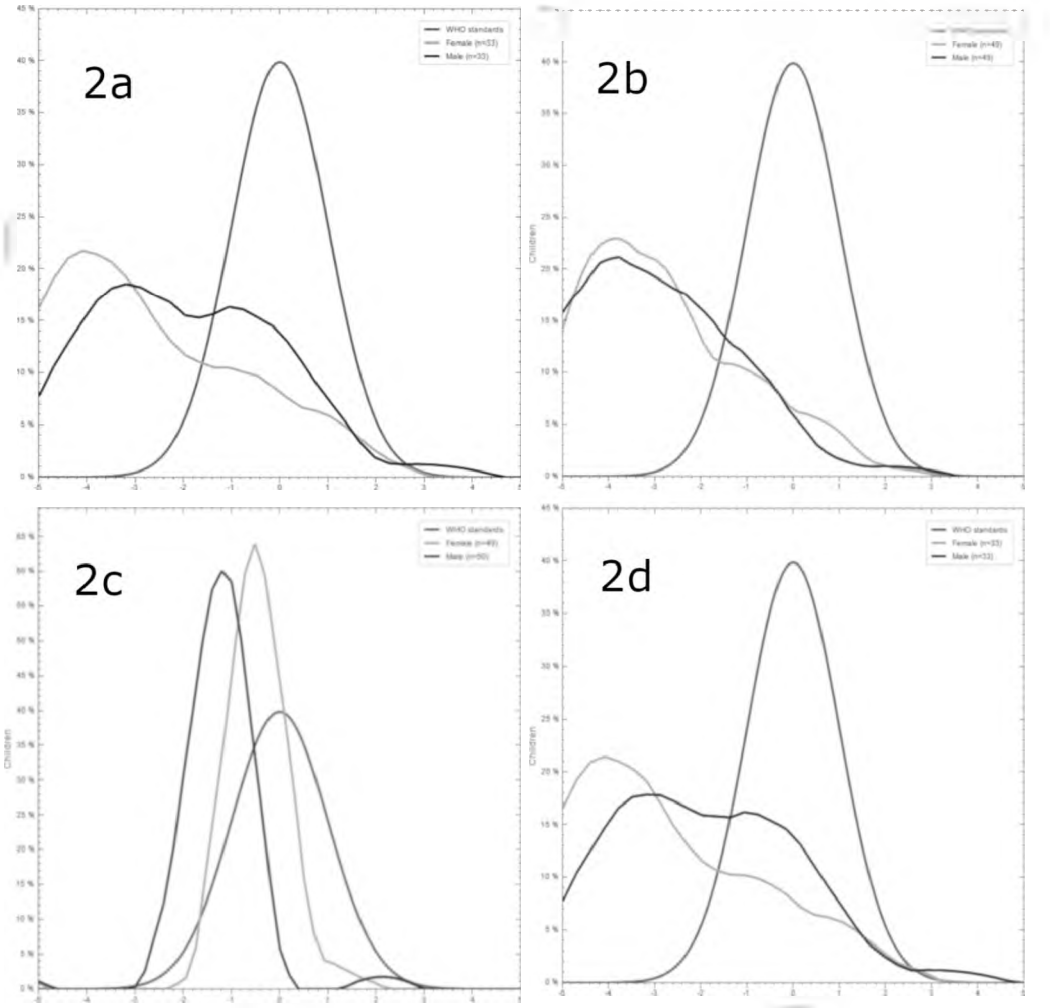


Figure 2.Anthropometric variables of sample population compared with WHO z-scores. 2a. Weight-for-height/ length Z score; 2b. Weight-for-age Z score; 2c. Length/ Height-for-age Z scores; 2d. BMI-for-age Z score

Maternal education status and nutrition indicators

Our findings reveal that more than 90% of the women fed their child with colostrum, irrespective of the education status. Table 3 finds relation between mother's education status and nutrition indicators. It was found that in more than 90% of the families, it was believed that non-vegetarian foods including eggs should not be given to the child (Figure 3).Maternal education status is positively associated with better health status of the infants (Pries *et al.*, 2017)Patel et al.,

2012). Our findings reveal that more than 90% of the women fed their child with colostrums, irrespective of the education status. Table 3 finds relation between mother's education status and nutrition indicators. A positive correlation was found between maternal education status and awareness about the importance of breastfeeding ($r=0.5$, $p<0.01$, $n=200$), knowledge of composition of breast milk ($r=0.519$, $p<0.01$, $n=200$). However, more than 90% of the women practiced exclusive breastfeeding. It was found that only those mothers who were educated beyond graduation were aware of / took benefit of Supplementary Nutrition Programme under ICDS ($r=0.204$, $p<0.05$, $n=200$). Thus, an overall positive correlation between mother's education status and certain nutrition indicators indicates a core importance of mother's awareness and education with desirable infant feeding practices. A number of studies in the past have given similar results (Sethi, Kashyap and Seth, 2003; WHO, 2011; Cribb, Warren and Emmett, 2012; Patel *et al.*, 2012; Shankar *et al.*, 2017). Women with higher education were more aware about scientific importance and composition of breast milk ($r=0.594$, $p<0.01$, $n=200$). Exclusive breastfeeding was followed by more than 90% of the women from population. The respondents informed that their knowledge was due to regular awareness campaigns, TV advertisements run by governments, and proper counseling received during delivery as per the inferences from interviews conducted. Thus, it can be inferred that even without having scientific knowledge about composition of breast milk or the importance of breastfeeding, the women and the families can be convinced to follow certain infant feeding practices that are significantly important for the holistic development of the child.

Only two respondents took advantage of government-run schemes like ICDS (Integrated Child Development Scheme). When interviewed, it was found that the women's (and their spouses') received formal education in nutrition. On the other hand, data shows that in 2015, ICDS alone has served over 19 million pregnant and lactating women (Rao and Kaul, 2018). Our finding, however, raises a question on efficiency of such schemes reaching at the grass root levels of the target population. Not only should the centers be adequately staffed, but also there should be timely availability of resources that can be used to provide nutritional awareness among local populations (Sahoo *et al.*, 2016).

Table 3 Nutrition indicators in relation to mother's education status

Indicators	Mother's education status					
	Pearson's correlation coefficient	<10th (n=60)	10th (n=42)	12th (n=56)	UG (n=28)	PG (n=14)
Colostrum given (%)	-0.106	100	85.71	82.14	100	100
Exclusive BF (%)	-0.135	100	95.24	89.29	100	85.71
Awareness about importance of BF** (%)	0.500	3.33	10	20	50	85.71
Knowledge about composition of breastmilk** (%)	0.519	0	9.52	3.57	35.71	85.71
Stopped BF after initiation of CF (%)	0.040	3.33	4.76	10.71	7.14	0
Awareness about CF** (%)	0.594	6.67	33.33	42.86	85.71	100
Feeds with IF (%)	0.044	16.67	4.76	17.86	21.43	14.29
Awareness about government schemes on IF* (%)	0.204	0	0	0	0	14.29
Taken benefits of government schemes on IF* (%)	0.204	0	0	0	0	14.29

Data is in percentage; *($p<0.05$); **($p<0.01$)

Cultural beliefs and myths

Cultural and religious beliefs, social taboos and myths, in context to weaning and feeding practices, are an important factor prevalent in Indian communities which significantly affect the health status of infants and children (Kambli, 2012; Sabharwal, 2014). It was found that in more than 90% of the families, it was believed that non-vegetarian foods including eggs should not be given to the child because of Hindu religious beliefs and customs. Pulses were believed to result in gas formation and upset stomach. The results were in line with previous studies carried out in India (Bhanderi and Choudhary, 2011; Lodha and Bharti, 2013; Sabharwal, 2014). Figure 1 shows prevalence of various beliefs that existed in our study sample. An interesting finding was that most of the families were found to believe that girls should be given less of ghee and nuts, considering them to be 'hot' foods which would result in early menarche. Curd and citrus fruits were believed to result in cold and cough. Previous researches have also shed light on the beliefs surrounding 'hot' and 'cold' foods (Bhanderi and Choudhary, 2011).

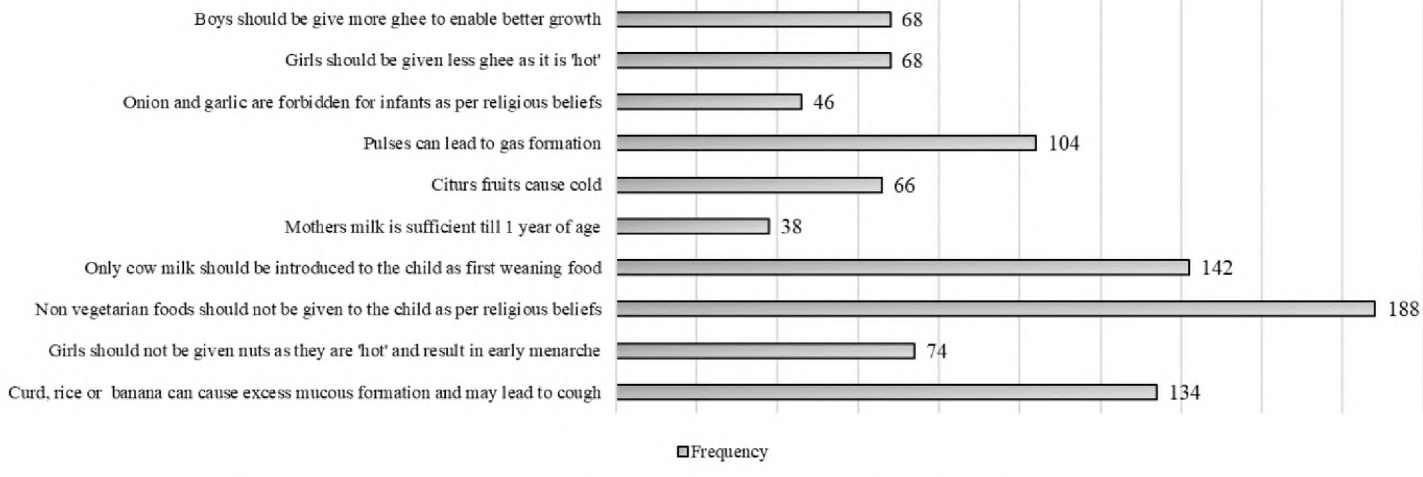


Figure 3. Cultural beliefs and myths existing in the study sample

Dietary pattern of the children

Cereals(mainlywheatandrice)wasapartofthedietofmorethan90%ofthechildren(Figure 4).Packed or junk food included biscuits, *frooti*, candies/chocolatesandchipswerepartofdiet of 69% of the children. Pulses, mainly *dal* soup contributed to diets of 61% of the children. Cow milk was fed to 42% of the children. Fruits and vegetables were a constituent of diet of only 40% of the children and only apple, banana and potato were given. Fats and sugars were added to the diets of more than 95% of the children to increase energy density and palatability of the foods.

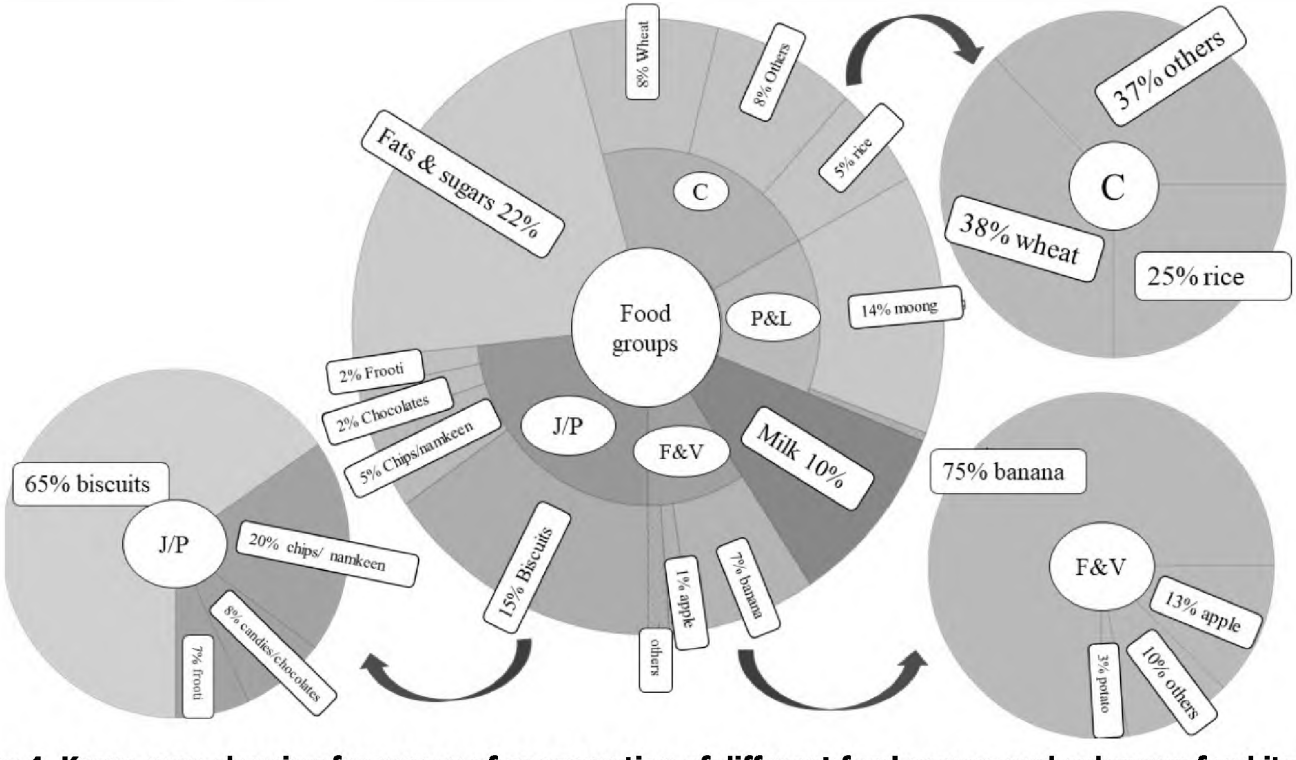


Figure 4. Krona map showing frequency of consumption of different food groups and subgroup food items

According to indicators listed in Table 4, it was found that in our sample group, only 37% children were fed with minimum meal frequency, and the diets of only 21% children met the criteria of minimum dietary diversity. According to UNICEF, only about 16% of the infants of low- and middle income countries meet the criteria of a minimum acceptable diet (UNICEF, 2018). Wang et al. has reported an improvement in rate of minimum dietary diversity from 46.1% to 58.4% on distribution of complementary food supplements (Wang *et al.*, 2017).

Table 4 WHO indicators for assessing infant and young child feeding practices

Indicators	Formula	Observation
Minimum meal frequency (MMF)	2-3 times for breastfed infants 4 times for non-breastfed infants	N=74
Minimum dietary diversity (MMD)	If food includes minimum four food groups	N=42
MMF of the sample	$\frac{n \text{ received foods from } \geq 4 \text{ food groups during the previous day}}{\text{N}}$	0.74
Minimum acceptable diet (MAD) of the sample	$\frac{n(breastfed) \text{ received MMD and MMF}}{\text{N (breastfed)}}$	18/190 = 0.094
	$\frac{n(non-breastfed) \text{ received MMD and MMF}}{\text{N (non-breastfed)}}$	0/10 = 0

CONCLUSION

It is difficult to draw a single conclusion about complementary feeding practices in Punjab. Our study has highlighted the poor dietary pattern and quality of complementary feeding practices of Punjab. Mothers with education above 10th are more aware about exclusive breast feeding, composition of breast milk and initiation of complementary feeding. Most of the infants covered under survey belong to lower income group and they fully depend upon breast milk. Complementary feeding in most of the regions originates from cultural factors. There is huge gap between knowledge and practical implementation. A holistic nutritional intervention approach to improve nutritional status of such communities is required. This can include introduction of fortified complementary food or modification of traditional recipes into nutrients rich recipe and motivating them to remove existent myth associated with complementary feeding practices Undoubtedly, effort should be made to educate mothers to improve the dietary quality of the complementary food fed to infants and restricting intake of cold drinks, biscuit, chips and snacks of low micronutrients density.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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