HEALTH PROMOTION

Validation of Gender Friendly Breastfeeding Knowledge scale among young adults

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Keywords

Breastfeeding • Knowledge • Scale • Behaviour • Practice • Youth

Summary

Introduction. *Breastfeeding is the most effective intervention to improve child health. Young adults, both genders play an important role in society supporting breastfeeding as they will be stepping towards parenthood in the near future. Bringing awareness and busting the myths among them is essential. This study aimed to develop a Gender Friendly Breastfeeding Knowledge scale based on a conceptual framework that reflected the knowledge of young adults and evaluates its validity and reliability.*

Methodology. *Development of the questionnaire for Conceptual framework and item generation was done using PubMed, Google Scholar, other sources and expert opinion. The type of measurement was structured as a 5-point Likert scale. The Lawshe technique to assess the content validity ratio. A cross-sectional survey in graduation colleges situated in Mangalagiri or within the radius of 30 km of Mangalagiri, Andhra Pradesh, India was conducted in 2020. 1400 Adult males and females aged 20-25 years and perusing full-time graduation course were recruited. For each item in the Gender Friendly Breastfeeding Awareness scale, we assessed individual item characteristics and item-test correlation. To check to construct validity, we performed exploratory factor analysis and confirmatory factor analysis.*

Results. *Expert panel retained 23 items from initially 30 items. The content validity index score for the each of 23-items in the scale was more than 0.80. A four-factor structure perfectly fitted the data and illustrated 54% of the variation in knowledge of breastfeeding. 4 stages of CFA were completed. The chi-square = 860.534 was significantly above the 0.01 level. Cronbach's alpha = 0.787 based on standardized items reflected the overall internal consistency of the Gender Friendly Breastfeeding Awareness scale.*

Conclusion. *Gender Friendly Breastfeeding Knowledge scale is a valid and reliable tool, it is recommended that this scale be used in communities, educational institutions, and in relevant research to assess Breastfeeding knowledge among young adults of both genders, thereby promoting breastfeeding practices in the future.*

Introduction

Breastfeeding is the most effective intervention to improve child health. In 2018, stunting affected an estimated 21.9% (14.9 crores) of children under five and wasting continued to threaten the lives of an estimated 7.3% (4.9 crores) of children under-five globally [1]. Under-nutrition is associated with at least 45% of child deaths [2]. In 2011 it is estimated that suboptimal breastfeeding, especially non-exclusive breastfeeding contributes to 11.6% of mortality in children under five years of age [3].

Breastfeeding not only helps in bonding and development of the infant but also delays a new pregnancy thus protecting the mothers' health against ovarian and breast cancers [4]. Breastfeeding is an unbeaten way of providing ideal food for the healthy growth and development of infants. It is a global public health recommendation as per Innocent Declaration that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development, and health. Exclusive breastfeeding is defined as "giving a baby only breast milk, and no other liquids or solids, not even water. Drops or syrups consisting of vitamins, mineral supplements or medicines as permitted" [4]. The World Health Organization also recommends exclusive breastfeeding in the first six months of life and supplemented breastfeeding up to two years or more [4]. It is found that only 40% of children younger than six months are exclusively breastfed worldwide among 194 countries as evaluated using the global breastfeeding scorecard in 2017 [5]. Most breastfeeding difficulties are a relatively normal experience; however, due to the wide range of severity, they can be very stressful and have been a risk factor for breastfeeding discontinuation in different studies [6-8].

To improve this situation, mothers and families require support to initiate and continue appropriate breastfeeding practices in the first six months of life. Mother's Absolute Affection is a nationwide program of the Ministry of Health and Family Welfare, Government of India to build an enabling environment for breastfeeding through

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awareness generation activities, targeting pregnant and lactating mothers, family members, and society to promote optimal breastfeeding practices [9]. As a major population of young adults, both genders play an important role in society supporting breastfeeding as they will be stepping towards parenthood in the near future. Bringing awareness and busting the myths among this population would bring a lot of change in improving breastfeeding.

On an extensive review of literature, to the best of authors' knowledge, there are tools to assess knowledge of health personnel and maternal perception for breastfeeding [10-15]. However, there is no validated tool for non-healthcare young adults, addressing both genders, which has to be studied. Hence this study was conceived by the authors to perform the construct validation and evaluate the internal consistency of a gender friendly questionnaire to develop an understanding of breastfeeding among young adults and aiming at its application in the Indian population of young adulthood.

Breastfeeding is a complex phenomenon that can undergo biological, psychological, cultural, social, economic, and political influences. Several global tools have been developed and tested to assess some aspects of the breastfeeding process. These instruments involve elements such as maternal confidence, newborn's behavior, mother's behavior, positioning, holding, effective milk extraction, breast aspects, maternal satisfaction, mother's perception, maternal experience, among others [16]. A series of measurable scales of the most diverse aspects are available; however, they are old and not updated. Young adulthood is not included in many breastfeeding evaluation studies. A validated gender friendly questionnaire for breastfeeding among young adults, who are future parents, is not available in the literature. People are attending colleges to attain higher education. The literacy rate among youth (ages 15-24) has improved in India. In 2018, the youth literacy rate was 92% which was 86.1% in 2015 [17]. However, there is no proper education regarding breastfeeding. So, young adults are the ideal population to create awareness and bust their myths about breastfeeding. This study aimed to develop a Gender Friendly Breastfeeding Knowledge scale based on a conceptual framework that reflected the knowledge of young adults and evaluates its validity and reliability.

Community is the perfect setting and is often preferred to validate any questionnaire however due to reticent behaviour of young adults in the community, logistic reasons, availability of good sample, and availability of peers to share their thoughts, the college setting is selected for the present study.

Methods

Design

This validation study developed and evaluated the Gender Friendly Breastfeeding Knowledge scale.

Development of the questionnaire

Conceptual framework and item generation

Using PubMed, Google Scholar, and other sources, we carried out a literature review relating to knowledge of breastfeeding. We coded the results into themes reflecting particular areas of breastfeeding awareness among young adults. Through a review of the literature, we found that knowledge on breastfeeding includes general knowledge, colostrum, benefits to mothers and babies, effective feeding method, duration of feeding, expressed breast milk, storage of EBM, complementary feeding, and problems with breastfeeding. Knowledge related to breastfeeding positioning and attachment was not included in this scale to ensure a shy free environment for young adults. The benefit of breastfeeding to the baby such as provides immunity to the child, good for digestion of the child, hygienic for a child, and Improve the IQ of the child. The benefit to mothers such as weight loss/decreased risk of osteoporosis for mothers prevents breast and ovarian cancer for the mother helps in the involution of uterus/lactation amenorrhea of mother and promotes bonding for mother and baby. Benefits to family, such as lower medical expenses for everyone in the family, ensure few sick days of mother and baby, and increases work productivity. Exclusive breastfeeding is the child is fed by only breast milk, without any other food in the first six months irrespective of prelacteal feed. Role of family and particularly fathers in breastfeeding practices [10, 18-21]. The conceptual framework of the current study, based on the aforementioned literature review included multidimensional facets for promoting breastfeeding among young adults, consisting of first general awareness of breastfeeding, storage of BM, Frequency like colostrum, duration of exclusive feeding, expressed breast milk, Exclusive breastfeeding complementary feeding, second benefits to babies, third benefits to mothers, and last role of father, family, and society.

We generated 30 items based on the conceptual framework. The type of measurement was structured as a 5-point Likert scale to measure the degree of breastfeeding knowledge of young adults (1 = false, 2 = may be false, 3 = don't know, 4 = may be true, 5 = true). The statement was framed both positively and negatively to add variety and limit respondent reporting bias. May option was included to identify the grey areas of knowledge. The positive items were scored 1, 2, 3, 4, 5. Then the negative items were rescored as 5, 4, 3, 2, 1.

Content validity testing

The content validity of the scale was based on the experts' assessment that items and questions in an instrument were critical, important, and applicable to the young adults. The purpose of this was, therefore, to ensure that the scale of Gender Friendly Breastfeeding Awareness is relevant, clear, concise, consistent, and culturally appropriate. Qualitative and quantitative approaches had also been applied. In the qualitative phase, a panel consisted of 14 specialists of paediatrics,

gynaecologists, community medicine, master of public health, personnel from National Health Program like ICDS, medical officer, nursing officer, ANM/ASHA, Female nursing orderly, and undergraduate teacher who were in promoting breastfeeding and analyzed the questionnaire's pronunciation, evaluated grammar, wording, and scaling of the questionnaire. We choose the Lawshe technique to assess the content validity ratio (CVR). The substantiveness of each object was analyzed by experts. Using a three-point rating scale, they measured the necessity of the items: a) not necessary; b) useful, but not essential; and c) essential. The CVR was determined using the formula for each item (N = the total number of experts and n = the number of experts who have selected the c) option for each item) [22]. Through these processes, a preliminary questionnaire of 23 items consisting of 8 general, 4 benefits of breastfeeding to the child, 4 benefits of breastfeeding to mother, and 7 breastfeeding frequency and was composed. We performed 50 pre-test interviews on the 23 items on the scale. The participants were MBBS College undergraduate students. We performed individual 10-minute interviews in which respondents determined if each sentence was false, may be false, don't know, may be true, true, recognizing ambiguous terms or phrases, and explaining where was it difficult to answer the question. Interviews were conducted through google forms and phone. The scale was further revised for grammar, language as required after pilot testing.

Validity and reliability assessments

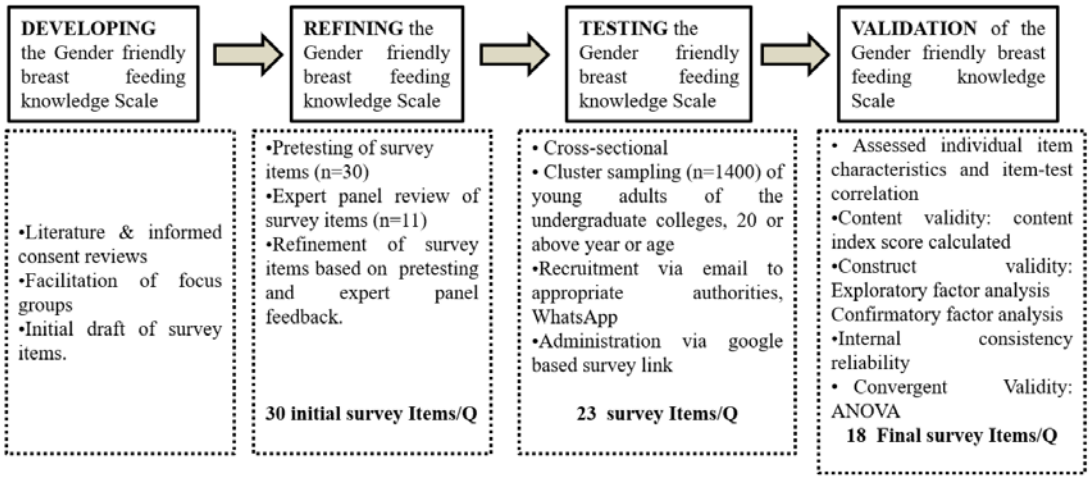
A third revision produced the final version of Gender Friendly Breastfeeding Knowledge scale. We conducted a cross-sectional in graduation colleges situated in Mangalagiri or within the radius of 30 km of Mangalagiri, Andhra Pradesh, India in 2020. Adult males and females aged 20-25 years and perusing full-time graduation course were recruited. The sample size was calculated based on the prevalence of knowledge of breastfeeding among students in a college is 55% [23]. Level of the confidence interval was kept at 95%, i.e. Z = 1.96. Cluster random sampling was used. To overcome the impact of study design on sampling variability, the design effect is used to estimate the sample size. The design effect of three was taken for calculating the sample size for this study. With absolute precision of 5%, the sample size was estimated to be 1,188. Assuming a non-response rate of 15% the final sample size was 1,366 students. Therefore, a sample of 1,400 students was studied. Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.6 to 0.9 was considered appropriate. All graduation colleges in the target area, having official websites were enumerated using google. Each graduation college was equivalent to one cluster. 14 clusters were randomly selected. One undergraduate college was considered equivalent to one cluster. The colleges differ in size, academics, demographics, and cultural diversity, which offered a diverse study population. From each cluster minimum of the first 100 students were enrolled for the study. Principals of the colleges were approached to discuss the need and purpose of research. A participant information sheet copy was shared with the principals. The anonymity of the school and student was ensured. After receiving permission from the concerned authority. The questionnaire link was sent electronically via google and WhatsApp to the college authority or representatives. Students were asked to fill the Google form from their email id. The first question of the Google form was the consent form with the answer "I accept to participate" to access subsequent questions. Clicking "I accept to participate" was considered equal to informed consent. Gender Friendly Breastfeeding Knowledge scale with demographic details was administered to the students.

The data collected were analyzed with the assistance of SPSS 20 and AMOS (IBM Inc., Armonk, NY). The characteristics of the participants were analyzed using descriptive statistics. For each item in the Gender Friendly Breastfeeding Awareness scale, we assessed individual item characteristics and item-test correlation. We reviewed missing items and summarised the mean, SD, and item-test correlation. The removal of items in this step was based on a low correlation of item-tests ($r < 0.40$). Second, to check to construct validity, we performed exploratory factor analysis. We constructed exploratory models with strong item-test correlation values, including all remaining variables. To simplify the analysis of loadings, models were rotated using varimax rotation. We evaluated the exploratory factor loadings for each item and classified factors from those with a correlation $r > 0.40$ per the respective loadings. We assessed whether items cross-loaded on multiple variables and whether it made logical sense to group individual items loaded onto variables. The Keizer-Meyer-Olkin (KMO) sampling adequacy measure and the Bartlett sphere test were performed to verify that the data were acceptable for EFA. The reliability was measured by the alpha coefficient of Cronbach. Cronbach Alpha values > 0.6, object-total correlation coefficients > 0.20, and interitem correlation coefficients < 0.80 and higher than zero are considered appropriate. If its item-total correlation coefficient is less than 0.2, the item was considered for deletion, given that its deletion resulted in an increase of more than 0.1 in the alpha coefficient of Cronbach. Using principal component analysis with varimax rotation, exploratory factor analysis (EFA) was performed (Fig. 1). This study was approved by the Institutional Ethics Committee.

Results

The demographic characteristics of the 1400 young adults who completed the 23-item Gender Friendly Breastfeeding Knowledge scale are presented in Table I. Their mean age was 21.1 ± 1.35 years, and 21.7% were males.

Fig. 1. Gender Friendly Breastfeeding Knowledge scale development and analysis process.



Tab. I. Demographics of participants from depicting age groups and major breakdown (n = 1,400).

Variable	Category	Gender n (%)		Total n (%)	Chi	P-value
		Female	Male			
Age (years)	20	493 (83.4)	98 (16.6)	591 (100.0)	73.1	< 0.001
	21	374 (77.3)	110 (22.7)	484 (100.0)		
	22	104 (81.3)	24 (18.8)	128 (100.0)		
	23	73 (83.0)	15 (17.0)	88 (100.0)		
	24	18 (56.3)	14 (43.8)	32 (100.0)		
	25	34 (44.2)	43 (55.8)	77 (100.0)		
Residence	Rural	418 (77.1)	124 (22.9)	542 (100.0)	3.6	< 0.001
	Urban	673 (79.3)	176 (20.7)	849 (100.0)		
	Tribal	5 (55.6)	4 (44.4)	9 (100.0)		
Marital status	Unmarried	1,047 (79.7)	267 (20.3)	1,314 (100.0)	24.47	< 0.001
	Married	49 (57.0)	37 (43.0)	86 (100.0)		
Mother literacy status	Less than 5 standard	155 (70.8)	64 (29.2)	219 (100.0)	24.68	< 0.001
	5 standard to 9 standard	212 (71.4)	85 (28.6)	297 (100.0)		
	10 standard or more	729 (82.5)	155 (17.5)	884 (100.0)		
Father literacy status	Less than 5 standard	147 (73.1)	54 (26.9)	201 (100.0)	8.43	< 0.001
	5 standard to 9 standard	139 (73.2)	51 (26.8)	190 (100.0)		
	10 standard or more	810 (80.3)	199 (19.7)	1,009 (100.0)		
Mother occupation	Agriculture	54 (57.4)	40 (42.6)	94 (100.0)	30.66	< 0.001
	Labour	34 (91.9)	3 (8.1)	37 (100.0)		
	House wife	810 (78.7)	219 (21.3)	1,029 (100.0)		
	Other	198 (82.5)	42 (17.5)	240 (100.0)		
Father occupation	Agriculture	262 (70.2)	111 (29.8)	373 (100.0)	43.33	< 0.001
	Labour	126 (85.7)	21 (14.3)	147 (100.0)		
	Not working	1 (12.5)	7 (87.5)	8 (100.0)		
	Other	707 (81.1)	165 (18.9)	872 (100.0)		
Socioeconomic status as per BJ Prasad 2020 (Missing 287)	INR 7533 and above (upper)	348 (77.2)	103 (22.8)	451 (100.0)	4.99	< 0.001
	INR 3766-7532 (upper middle)	176 (74.3)	61 (25.7)	237 (100.0)		
	INR 2260-3765 (middle)	233 (82.0)	51 (18.0)	284 (100.0)		
	INR 1130-2259 (lower middle)	112 (79.4)	29 (20.6)	141 (100.0)		
Study field	MBBS, nursing	329 (82.3)	71 (17.8)	400 (100.0)	14.7	< 0.001
	Pharmacy, Pharmaceutical, Physiotherapy	480 (80.0)	120 (20.0)	600 (100.0)		
	Other like Engineering MBA, B.com, B.Sc.	287 (71.8)	113 (28.3)	400 (100.0)		
Total	1,096 (78.3)	304 (21.7)	1,400 (100.0)			

Tab. II. Summary statistics for 23 Items Included in the Gender Friendly Breastfeeding knowledge scale: item means, SDs.

Item No./ Question No.	Questions in Gender Friendly Breastfeeding Knowledge scale	Mean	Std. deviation
1	Mother milk is best for the baby	4.95	0.354
2	Mother milk is not easily digested by the child	3.52	1.583
3	Breastfeeding causes breast and ovarian cancer to mother	3.86	1.501
4	Child should be breastfed as early as possible soon after birth	4.74	0.727
5	Colostrum (breast milk secreted immediately after delivery) should not be discarded	4.40	1.132
6	Breastfeeding improves immunity of the child	4.90	0.460
7	Breastfeeding has no role in lactational amenorrhea/ family planning/ avoiding immediate pregnancy for 6 months after delivery	2.96	1.693
8	Child needs water along with Mother milk up to first 6 months of life	2.91	1.690
9	Mother milk improves the intelligence (IQ) of child	4.34	1.075
10	Breastfeeding promotes bonding between mother and baby	4.75	0.687
11	Breastfeeding reduces sickness in mother and baby	4.49	1.071
12	Father should not support the mother in breastfeeding	3.64	1.555
13	Breastfeeding decreases work productivity/ earnings/ working days of family	3.41	1.560
14	Breast milk cannot be stored in refrigerator	2.24	1.518
15	Exclusive breastfeeding is giving only breast milk for first 6 months of life/ child/ baby/ age	4.22	1.323
16	Child can be breastfed up to 2 years	4.26	1.188
17	Mother cannot continue breastfeeding after starting the supportive/complementary feeding from 6 months of life	3.28	1.563
18	Breastfeeding increases health related expenses of the family	3.21	1.713
19	Breastfeeding should be given only when child cries	3.47	1.595
20	Breast milk banks similar to blood banks are available in hospitals	3.01	1.554
21	Breastfeeding increases the satisfaction of the mother and family	4.52	0.950
22	As a future parent you are decision maker in facilitating breastfeeding	4.72	0.737
23	You are a motivator in facilitating breastfeeding	4.50	1.021

Table II shows the mean and SD for each item. Most items demonstrated variability in response. Items with the highest mean of 4.95 were #1 (Mother milk is best for the baby) and #10 (breastfeeding promotes bonding between mother and baby).

Face/content validity

The cumulative face/content validity of the scale was verified by expert panel assessments and pre-testing interviews. At this point, all 23 items were retained from initially 30 items, and no new items were produced. Pretesting interview participants indicated the importance of adding a "may be true" or "may be false" response option to the true/ false/ don't know format. We refined the Gender Friendly Breastfeeding Knowledge scale to reflect this feedback. The content validity index score for the each of 23-items in the scale was more than 0.80.

Construct validity

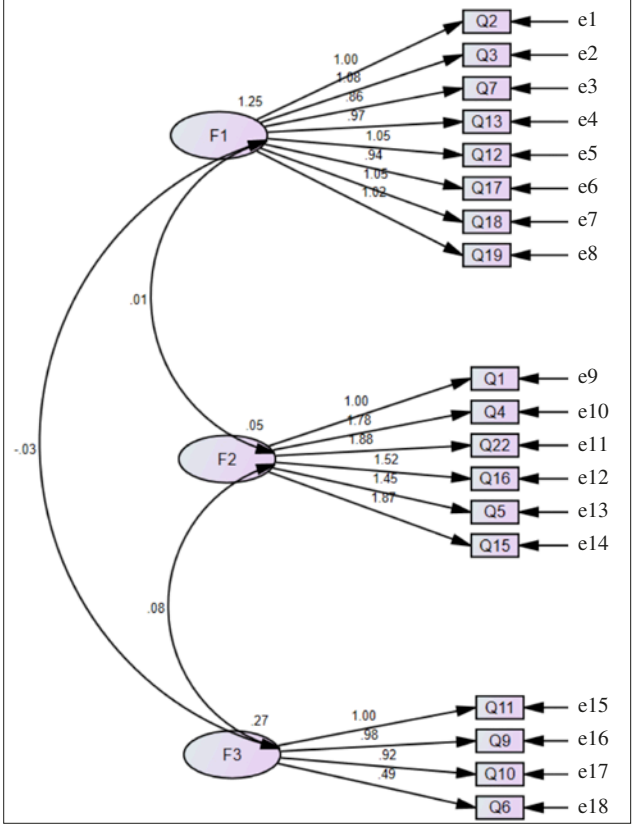
Exploratory factor analysis has been undertaken. The KMO value was 0.868, and the result of Bartlett's test of sphericity was $\chi 2 = 7{,}235.58$ ($p < 0.001$); therefore, the sample was suitable for conducting EFA. Using eigenvalues > 1 and evaluation of the scree plots, factor structures were explored. The factor extraction parameters have been set at 0.30 for communality and 0.40 for factor loading. Furthermore, products with a cross-load of 0.30 or greater and a gap of less than 0.20 have been excluded. The EFA process was repeated six times and deleted five items/questions. Item 8 (child needs water along with mother milk up to first 6 months of life), 14 (breast milk cannot be stored in the refrigerator), 20 (breast milk banks similar to blood banks are available in hospitals), 21 (21 breastfeeding increases the satisfaction of the mother and family), 23 (you are a motivator in facilitating breastfeeding) were removed due to numerous cross-loadings, low factor loadings, or poor logical fit. A four-factor structure perfectly fitted the data and illustrated 54 percent of the variation in knowledge of breastfeeding. To represent the logical context concerning breastfeeding, each factor was named as Mother and family role and benefits, breastfeeding frequency and duration, benefits to the child, and others (Tab. III). Factor 4 had only one item # 5 (Colostrum breast milk secreted immediately after delivery should not be discarded). Considering this an important question it was consider in factor second to model under CFA. This consideration led to a total variance of 53.4%.

The CFA was carried out to explore the dimensionality of Gender Friendly Breastfeeding Knowledge scale derived from the EFA. 4 stages of CFA were completed. The chi-square = 860.534 was significantly above the 0.01 level (Fig. 2). Root mean square residual (RMR) = 0.101; root mean square error of approximation (RMSEA) = 0.06; Tucker Lewis index (TLI) = 0.88; comparative fit index (CFI) = 0.89; Goodness of Fit Index (GFI) = 0.93; and Adjusted Goodness of Fit Index (AGFI) = 0.91 appear good.

Tab. III. External validity using principal component analysis with varimax rotation Gender Friendly Breastfeeding Knowledge scale.

Item No./ Question No.	Questions in Gender Friendly Breast-feeding Knowledge Scale	Mother and family role and benefits	Frequency	Benefits to child	Other
Eigenvalue		4.58	2.85	1.23	1.07
% of variance		25.4	15.8	6.8	5.9
3	Breastfeeding cause breast and ovarian cancer to mother	0.830			
12	Father should not support the mother in Breastfeeding	0.789			
19	Breastfeeding should be given only when child cries	0.755			
2	Mother milk is not easily digested by the child	0.751			
13	Breastfeeding decreases work productivity/ earnings/ working days of family	0.740			
18	Breastfeeding increases health related expenses of the family	0.732			
17	Mother cannot continue Breastfeeding after starting the supportive/ complementary feeding from 6 months of life	0.718			
7	Breastfeeding has no role in lactational amenorrhea/ family planning/ avoiding immediate pregnancy for 6 months after delivery	0.621			
4	Child should be breastfed as early as possible soon after birth		0.690		
1	Mother milk is best for the baby		0.661		
22	As a future parent you are decision maker in facilitating Breastfeeding		0.659		
16	Child can be breastfed up to 2 years		0.557		
11	Breastfeeding reduces sickness in mother and baby			0.736	0.336
9	Mother milk improves the Intelligence (IQ) of child			0.676	
10	Breastfeeding promotes bonding between mother and baby		0.312	0.665	
6	Breastfeeding improves immunity of the child			0.586	
5	Colostrum (breast milk secreted immediately after delivery) should not be discarded		0.347		0.667
15	Exclusive Breastfeeding is giving only breast milk for first 6 months of life/ child/ baby/ age		0.334		-0.560

Fig. 2. The standardized estimates of confirmatory factor analysis model final 18-Item Gender Friendly Breastfeeding Knowledge scale.



Convergent validity

Demographic differences in Gender Friendly Breastfeeding Knowledge scale are detailed in Table IV. There were statistically significant differences in mean scores by age, residence, mother's education, father's education. Mother's occupation, father's occupation, socioeconomic class, and study field. Young adults from urban areas, with mother and father, educated more than 10th standard, and upper socioeconomic class had higher mean Gender Friendly Breastfeeding Knowledge scale scores ($p < 0.01$). No sex differences were observed.

Reliability

Cronbach's alpha was used to test the internal consistency and scale reliability of the questionnaire. Also, Cronbach's alpha was used to investigate the probability of shortening the questionnaire without sacrificing its properties and reducing its materials. The correlation values for each item were compared to all the other items. Cronbach's alpha = 0.787 based on standardized items reflected the overall internal consistency of the Gender Friendly Breastfeeding Awareness scale. To check the reliability of the subscales, the ICC was also measured. ICC values varied between 0.693 and 0.736, indicating adequate reliability for the Gender Friendly Breastfeeding Knowledge scale (Tab. V).

Tab. IV. Analysis of Variance (ANOVA) of Final 18-Item Gender Friendly Breastfeeding Knowledge scale.

Variable	Category	Mean	SD	P value
Gender	Female	73.10	9.94	0.827
	Male	73.24	10.23	
Age (years)	20	72.62	10.03	0.003
	21	73.01	10.31	
	22	74.23	9.50	
	23	74.86	9.13	
	24	78.84	7.39	
	25	71.56	9.62	
Residence	Rural	71.98	9.69	0.003
	Urban	73.87	10.15	
	Tribal	72.67	8.79	
Marital status	Unmarried	73.11	9.97	0.773
	Married	73.43	10.48	
Mother literacy status	Less than 5 standard	69.43	9.79	< 0.001
	5 standard to 9 standard	72.33	10.19	
	10 standard or more	74.31	9.75	
Father literacy status	Less than 5 standard	69.80	9.72	< 0.001
	5 standard to 9 standard	69.85	9.63	
	10 standard or more	74.41	9.84	
Mother occupation	Agriculture	72.68	9.57	< 0.001
	Labour	65.46	10.00	
	House wife	73.14	10.09	
	Other	74.42	9.28	
Father occupation	Agriculture	71.60	9.57	< 0.001
	Labour	69.07	10.51	
	Not working	64.75	10.73	
	Other	74.54	9.78	
Socioeconomic status as per BJ Prasad 2020 (Missing 287)	INR 7533 and above (upper)	74.16	9.67	< 0.001
	INR 3766-7532 (upper middle)	73.03	10.61	
	INR 2260-3765 (middle)	71.84	9.65	
	INR 1130-2259 (lower middle)	69.67	9.45	
Study field	MBBS, Nursing	74.95	11.21	< 0.001
	Pharmacy, Pharmaceutical, Physiotherapy	72.91	8.95	
	Other like Engineering MBA, B.com, B.Sc.	71.64	9.96	
Total	73.13	10.00		

Tab. V. Internal validity and reliability of Gender Friendly Breast-Feeding Knowledge scale.

Item No./ Question No.	Gender Friendly Breastfeeding Knowledge scale	Inter Item Correlation Coefficient	ICC	95% CI	Cronbach's alpha based on standardized items	Cronbach's alpha if item deleted
			0.715**	0.693 to 0.736	0.787	
1	Mother milk is best for the baby	0.279**	-	-	-	0.714
2	Mother milk is not easily digested by the child	0.666**	-	-	-	0.687
3	Breastfeeding cause breast and ovarian cancer to mother	0.721**	-	-	-	0.685
4	Child should be breastfed as early as possible soon after birth	0.259**	-	-	-	0.713
5	Colostrum (breast milk secreted immediately after delivery) should not be discarded	0.194**	-	-	-	0.714
6	Breastfeeding improves immunity of the child	0.285**	-	-	-	0.714

▶

Item No./ Question No.	Gender Friendly Breastfeeding Knowledge scale	Inter Item Correlation coefficient	ICC	95% CI	Cronbach's Alpha based on standardized items	Cronbach's Alpha if item deleted
			0.715**	0.693 to 0.736	0.787	
7	Breastfeeding has no role in lactational amenorrhea/ family planning/ avoiding immediate pregnancy for 6 months after delivery	0.565**	-	-	-	0.692
9	Mother milk improves the intelligence (IQ) of child	0.031	-	-	-	0.720
10	Breastfeeding promotes bonding between mother and baby	0.268**	-	-	-	0.713
11	Breastfeeding reduces sickness in mother and baby	0.196**	-	-	-	0.714
12	Father should not support the mother in breastfeeding	0.706**	-	-	-	0.685
13	Breastfeeding decreases work productivity/ earnings/working days of family	0.649**	-	-	-	0.689
15	Exclusive breastfeeding is giving only breast milk for first 6 months of life/ child/ baby/ age	0.076**	-	-	-	0.720
16	Child can be breastfed up to 2 years	0.095**	-	-	-	0.718
17	Mother cannot continue breastfeeding after starting the supportive/ complementary feeding from 6 months of life	0.676**	-	-	-	0.687
18	Breastfeeding increases health related expenses of the family	0.682**	-	-	-	0.684
19	Breastfeeding should be given only when child cries	0.674**	-	-	-	0.686
22	As a future parent you are decision maker in facilitating breastfeeding	0.296**	-	-	-	0.712

ICC: Intraclass Correlation Coefficient; CI: Confidence interval; ** $p < 0.001$ (2-tailed); Item 2, 3, 7, 12, 13, 17 were reverse coded.

Final questionnaire

The final Gender Friendly Breastfeeding Knowledge scale included three factors: Factor I (Mother and family role and benefits), Factor II (breastfeeding frequency and duration), and Factor III (Benefits to the child) areas. The total number of items was 18, with eight items for factor I, six items for factor II and 4 items for factor III (Tab. VI).

Tab. VI. Final 18 item Gender Friendly Breastfeeding Knowledge scale.

Item No.	Gender Friendly Breast-Feeding Knowledge scale	Tick any one				
		True	May be true	Don't know	May be false	False
1	Mother milk is best for the baby					
2	Mother milk is not easily digested by the child					
3	Breastfeeding cause breast and ovarian cancer to mother					
4	Child should be breastfed as early as possible soon after birth					
5	Colostrum (breast milk secreted immediately after delivery) should not be discarded					
6	Breastfeeding improves immunity of the child					
7	Breastfeeding has no role in lactational amenorrhea/ family planning/ avoiding immediate pregnancy for 6 months after delivery					

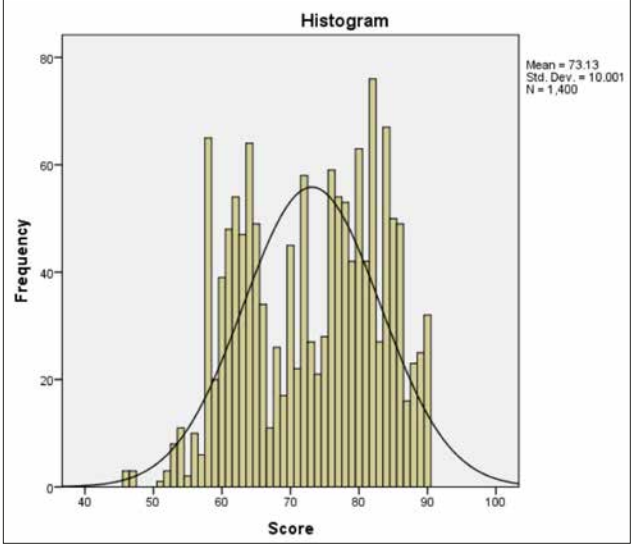
▶

Item No.	Gender Friendly Breast-Feeding Knowledge scale	Tick any one				
		True	May be true	Don't know	May be false	False
8	Mother milk improves the intelligence (IQ) of child					
9	Breastfeeding promotes bonding between mother and baby					
10	Breastfeeding reduces sickness in mother and baby					
11	Father should not support the mother in breastfeeding					
12	Breastfeeding decreases work productivity/ earnings/ working days of family					
13	Exclusive breastfeeding is giving only breast milk for first 6 months of life/ child/ baby/ age					
14	Child can be breastfed up to 2 years					
15	Mother cannot continue breastfeeding after starting the supportive/ complementary feeding from 6 months of life					
16	Breastfeeding increases health related expenses of the family					
17	Breastfeeding should be given only when child cries					
18	As a future parent you are decision maker in facilitating breastfeeding					

* Score for positively worded items: 1, 4, 5, 6, 8, 9, 10, 13, 14, 18 (1 = false, 2 = may be false, 3 = don't know, 4 = may be true, 5 = true); **score for negatively worded items: 2, 3, 7, 8, 11, 12,15, 16, 17 (5 = false, 4 = may be false, 3 = don't know, 2 = may be true, 1 = true).

The responses to each item are either 1 = false, 2 = may be false, 3 = don't know, 4 = may be true, 5 = true. The total Gender Friendly Breastfeeding Knowledge scale score can be between 18 and 90 (Fig. 3). Based on the normal distribution we divide GFBFKS scores into four categories; 80 and above = good, 65-80 = average, 50-65 = poor, and < 50 = no knowledge of breastfeeding, the Gender Friendly Breastfeeding Knowledge scale score of the 1,400 participants in the current study was 73.1 ± 10.0.

Fig. 3. Distribution of final 18-Item Gender Friendly Breastfeeding Knowledge scale scores.



Discussion

Mother's Absolute Affection is a national initiative of the Government of India's Ministry of Health and Family Welfare to build an enabling atmosphere for breastfeeding by awareness-raising campaigns, target pregnant and lactating women, family members, and community to encourage optimum breastfeeding practices [9]. To plan activities regarding breastfeeding promotion and facilitate male gender involvement in supporting breastfeeding, it is essential to have an objective, reliable, valid, and sensitive questionnaire to assess knowledge of breastfeeding among young adults of both genders and intervene accordingly. Some validated instruments are available to test awareness, attitude, trust, self-efficacy, or experience with breastfeeding [10-15].

To analyze some aspects of the breastfeeding process, there is a range of instruments that have been developed and evaluated. Few of them are Modified Breastfeeding Evaluation Scale [24], Breastfeeding Self-Efficacy Scale [15], the Breastfeeding Attrition Prediction Tool [22], Australian Breastfeeding Knowledge and Attitude Questionnaire [25], Preterm Infant Feeding Survey [26], Breast Milk Expression Experience [27], Breastfeeding Attrition Prediction Tool [28], Breastfeeding Knowledge, Attitude, and Confidence Scale [29], and Supportive Needs of Adolescents

Breastfeeding Scale [30]. However, young adults of both genders are not included in any breastfeeding evaluation studies. The goal of this research was to create a brief, accurate, and consistent questionnaire on the assessment of breastfeeding knowledge, which fills a void in the literature. The utility of the short, succinct, and shy free breastfeeding knowledge scale among young adults is in future parenthood breastfeeding rates would improve. Gender Friendly Breastfeeding Knowledge scale could easily be either self- or in-person administered. It includes major breastfeeding aspects. The 18-item GFBFKS is a valid instrument for assessing breastfeeding knowledge in the context of benefits to the child, mother, and family, role of the family in supporting breastfeeding, and recommended frequency and duration. Since this research used items to structure a scale, internal consistency was required. Acceptable internal consistency and reliability have been achieved. Three sub-scales created by PCA for construct validity, represented internal accuracy (Cronbach's alpha > 0.70) and internal reliability (ICC ranged from 0.693 to 0.736; $p < 0.01$; CI: 95%). This analysis showed that the Cronbach's alpha for the GFBFKS was above 0.7; thus, the objects were measured and compared with the same parameters. A minimum Cronbach's alpha value of 0.60 is considered ideal in research studies, thus this questionnaire is accurate for evaluating breastfeeding knowledge among young adults. GFBFKS was validated using wide-ranging samples which confirms its external validity. Our validity and reliability measures were equivalent to other tools for assessing breastfeeding knowledge [30]. The GFBFKS validation encourages its potential application in public health, clinical, and scientific contexts.

This research used factor analysis to assess the validity of questionnaire item ideas to decide how items could be divided into subscales and to pick and exclude some of the items from the tool. Three domains of breastfeeding awareness were built in this research through exploratory factor analysis. For each domain, it can provide the rationale for evaluating overview scales. This offers insight about which aspects of knowledge are missing for the studied participants and it can be directly geared at that factor and further action. Based on factor analysis, we omitted 5 things below 0.2 with factor loading. Based on factor analysis findings, it is normal to remove certain items from a scale.

Using the GFBFKS, we assessed breastfeeding knowledge among young adult female and male undergraduate college students. The mean score of breastfeeding knowledge was 73.13 (SD 10.0). Study participants had average knowledge of breastfeeding. The gender friendly initiative is a new and dynamic notion that takes into account how the person perceives and recognizes the importance of breastfeeding for making an informed decision about advocating breastfeeding in families and communities and practicing the same in their parenthood. In a society still breastfeeding is considered to be the mother's primary duty and female voice interaction [31]. Exclusive breastfeeding is vital to provide both mothers and children with immediate and long-term benefits [32]. It has been found that both professional and common man advocacy help decreases the likelihood of suboptimal breastfeeding practices [33, 34]. However effective methods and techniques help to build basic breastfeeding knowledge among young minds. This approach is relevant to future parenthood.

Lack of awareness among new mothers and support from household members who exercise authority over many household activities, including breastfeeding decisions, especially mothers-in-law, and grandmothers, is a key constraint. There have been several attempts to include men in the reproductive health program [35]. Lack of validated tools to assess breastfeeding knowledge of both genders possess a serious challenge to public health to plan, do, check and act.

GFBFKS can encourage openness towards discussions on the importance of breastfeeding and anticipate long-term changes in young adults' behaviours and practices. To discover other realms and components of the young adult sensitization regarding breastfeeding, our research could provoke continued inquiry. To further refine the scale, future prospective studies should investigate GFBFKS modeling, whether impacting breastfeeding knowledge in young adult brains are correlated with practice in their parenthood, and whether it contributed positively to the improvement of breastfeeding rates in the communities.

Strengths and limitations

The current research is important in that a reliable and relevant tool has been developed to assess breastfeeding knowledge among young adults of both genders. It is expected for future research and service planning, the Gender Friendly Breastfeeding Knowledge scale will be used to measure breastfeeding knowledge among young adults of both sexes. However, this research has a limitation. We cannot be certain of the relationship between knowledge of breastfeeding and practice of breastfeeding a child in the family because we conducted a cross-sectional survey. To more reliably estimate the predictive validity of the Gender Friendly Breastfeeding Knowledge scale, prospective studies are needed.

Conclusions

The Gender Friendly Breastfeeding Awareness scale is the first of its kind which addresses breastfeeding knowledge assessment for both genders. The final validated Gender Friendly Breastfeeding Awareness scale with three criteria and 18 items, a preliminary tool was built by a literature review, pre-testing, and expert content validity analysis, accompanied by a survey of 1,400 young adults and factor analysis. The internal consistency of the Gender Friendly Breastfeeding Knowledge scale was satisfactory. The criteria were met by construct validity and convergent validity, calculated by CFA. Because Gender Friendly Breastfeeding Knowledge scale is a

valid and reliable tool, it is recommended that this scale be used in communities, educational institutions, and in relevant research to assess breastfeeding knowledge among young adults of both genders, thereby promoting breastfeeding practices in the future.

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Conflict of interest statement

The Authors Declare there is no conflict of interest.

Authors' contributions

AG conceived the study design; AG wrote the manuscript draft. SS, NK, KS assisted in collection and synthesis of Data. RA & RK critically reviewed and revised the manuscript. RK approved the final draft. Authors declare the manuscript has been read and approved by all the authors, that the requirements for authorship have been met, and that each author believes that the manuscript represents honest work, and that information is not provided in another form.

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