Infants' Nutritional Status in Relation to their Mothers' Knowledge about Feeding and Weaning Practices in Zagazig City

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Abstract:

Background: The nutritional status of the infants depends on the feeding practices in the community. Lack of knowledge about balanced diet is a leading cause of primary malnutrition**.** **The aim** of the present study was to determine the mothers' knowledge regarding breast-feeding, weaning and follow-up practices in relation to their infants' nutritional status and to find out socio-economic correlates of mothers' feeding and weaning practices in Zagazig City. **Subject & Methods: Research design:** A descriptive and exploratory study was done. **The study subjects** included 200 mothers with their infants aged 6-18 months who fulfilled the selected criteria. **Setting:** Study was conducted at two maternal and child health centers at Zagazig City (Zagazig MCH ,and Sheba MCH). **Tools of data collection:** A questionnaire sheet was used to collect data include (a) socio-demographic data, (b) mother's knowledge about breast-feeding, weaning and follow-up practices, (c) infants' anthropometric measurements and (d) clinical assessment of the infants' malnutrition signs. **Results** indicated that 48% of the mothers initiated breast-feeding within one hour after birth. 57% practiced exclusive breastfeeding, and 71% had introduced liquid diet as first weaning food and 43% of them started weaning food when their infants reached 4-6 months age. 86% of mothers checked their infants' weight for age. The Pearson Correlation showed that weight for age (r= .347**), height for age (r= .750**) and height for weight (r= .560**) among the infants. The study reported significant relation between mothers' education and their knowledge about infants feeding and weaning practices. **The study concluded that** mothers' knowledge regarding breast-feeding, weaning and follow - up practices had significant effect on improving infants' nutritional-status outcome. **The study recommended** that conducting educational program for mothers regarding importance of good feeding and weaning practices at maternal and child health centers and healthy communication through mass media to promote mothers' knowledge about feeding and weaning practices.

Keywords: infants, nutritional status, feeding, weaning, practices.

Introduction:

Breast-feeding has a unique biological and emotional influence on the health of both mother and infant. It is furthermore an important determinant of infant health in the prevention of malnutrition and infections. The new WHO recommendation is of exclusive breast feeding for the first 6 months and complementary feeding after 6 months of age [(1)]. Exclusive breast feeding up to the completion of sixth month of life is the national feeding recommendation [(2)].

Breast milk is no doubt the ideal food for infants because it provides all the basic needs for growing infants up to 6 months, but is insufficient to cover all the needs beyond that period. The prevalence and duration of breast-feeding have also declined in many other parts of the world in the past years for a variety of social, economic and cultural reasons[(3)]. WHO programs regarding malnutrition and Lactation management are running since decades but malnutrition and child mortality remained unchanged. The UNICEF survey has shown that from 1999 to 2003 the prevalence of malnutrition has remained the same that is 57% in South Asia, while in 2006 it has been reduced to 53% [(2)].

Most cost effective intervention to reduce infant mortality in developing countries is promotion of exclusive breast feeding and appropriate complementary feeding practices. This can be achieved by health education and public awareness programs. This would lead to the achievement of the

fourth MDG (Millennium developing goal) which is to reduce by two-thirds the mortality rate of children under five, from the base year 1990 to the year 2015. Hence, an improvement in the feeding practices is recommended by the policy for implementation of Integrated Management of Neonatal Child Illness (IMNCI) Feeding Assessment guidelines for young infant feeding[4].

Weaning is the period during which an infant's diet is expanded and its dependence on milk as the sole source of nutrition is ended. It is important for the introduction of solid foods not to be delayed beyond the age of six months. Reasons for this are that, apart from solid foods providing in increased nutrient needs, it might then be difficult for the baby to accept the new tastes and textures of food later in life[5].

Natural weaning occurs as the infant begins to accept increasing amounts and types of complementary feedings while still breastfeeding is on demand. When natural weaning is practiced, complete weaning usually takes place at two years of age. Planned weaning occurs when the mother decides to wean without receiving signals from the infant that he is ready to stop breastfeeding. Some reasons commonly given for planned weaning include the following: not enough milk or concerns about the baby's growth, painful feedings or mastitis, returning to work, and a new pregnancy [6].

Complementary feeding as described by WHO refers to the addition of energy and non-energy containing fluids, non-human milk, and semi-solids or solids to children diet [7]. Weaning is easier if a child has taken milk from some other source besides mother's breast before that time. So it's a good idea to give an occasional bottle of breast milk to the child around 4 to 7 months (or sooner if you decide to wean earlier) - even if one plans to continue breastfeeding, this can facilitate the weaning process in the future [8].

Socioeconomic condition of families is assessed by housing, occupation, education and income levels in comparison to their country's statistical average from surveys. Socioeconomic indicators of poverty (poor housing conditions, low per capita income and energy consumption) are significantly associated with a greater risk of malnutrition and under 5 year mortality [7].

Significance of the study:

Literature has shown that malnutrition rates increase between 6 and 18 month, due to inappropriate feeding practices. Breast and complementary feeding, if adequately promoted and practiced, according to recommended guidelines by WHO, 2003[7] can prevent up to 19% of all childhood deaths in low-income countries. So the role of the present study is to investigate the mother's breast-feeding, weaning and follow-up practices in relation to the nutritional status of their infants.

Aim of the study:

1. To determine the mothers' knowledge regarding breast-feeding, weaning and follow-up practices in relation to the nutritional status of their infants.
2. To find out socio-economic correlates of mothers' breast feeding, weaning and follow-up practices in Zagazig City.

Research Questions:

- What are the breast feeding, weaning and follow-up practices of mothers?
- What is the infants' nutritional status?

Subjects and Methods:

Research design:

A descriptive and exploratory study was done.

Study setting:

A descriptive and exploratory study was done.

Two maternal and child health centers (MCH) at Zagazig City (Zagazig MCH ,and Sheba MCH) were randomly selected.

Study subjects:

A convenient sample of 200 mothers with their infants who fulfilled the following inclusion criteria:

Infants: (both sexes, age ranged from 6 – 18 months, and free from chronic diseases, not LBW, not premature, not a one of twins).

Mothers: (who attend the MCH centers during time of data collection, accept to participate in the study, free from chronic diseases).

Tools of data collection:

Questionnaire sheet developed by researcher consisted of:

A. Demographic data (the mothers' age, number of children in family, the mothers' educational level, mothers' occupation, mothers' nutritional knowledge sources, family type, monthly family income and the infants' age , gender, and birth order …etc).

B. Mothers' breast-feeding, weaning and follow-up practices, include 18 questions answered by mothers and rated by 1= yes and 0 = No scored and classified into bad practice "score of 1-10", and good practice "score of 11-18".

C. Anthropometric measurements (weight and length) were measured on the same day of interview and clinical examination for malnutrition signs of the infants include 12 items such as (pale skin, hair loss, weak muscles, patchy or irritated skin, edema, bleeding gums..ect.) are rated on a two point likert scale 1=present and 0=not present scored and classified into good nutrition " score of 1-6", and malnutrition "score of 7-12".

Content validity and reliability:

Five professors from nursing faculty revised the tools for clarity, applicability, comprehensiveness; understanding and ease for implementation and according to their opinion minor modification were done. Reliability of the tool done by test and retest of the pilot study sample in same place but in different occasion and no changes were done in the tool.

Field Work:

The data were collected over a period of 3 months starting from June, to August, 2015. Every infant with his mother was individually interviewed by the researcher to obtain data about the infants and their mothers' feeding and weaning practices.

All the anthropometric measurements were taken twice and an average was computed. Infants were weighed without clothes, using an infant electronic digital scale (model BIS) that was accurate to 0.01kg. The infant's length was measured using a non-stretchable 150 cm tape measure. The tape measure was attached to the table with two boards, one board was movable, and while the other one was attached to the table. The length was recorded to the nearest 0.1cm.

Pilot Study:

A pilot study was conducted on 20 mothers with their infants to test the feasibility and applicability of the tool. No modifications were done and the sample was added to the total study sample.

Administrative and ethical considerations:

Ethical approval and permission were obtained. The researcher also obtained permission from the district health office and the unit managers. The study purpose was explained to the mothers before they were requested to sign the consent form.

Statistical analysis

Statistical analysis was done with the Statistical Package for the Social Sciences (SPSS version 11.5). The questionnaire responses on breast-feeding and weaning practices were interpreted in percentiles. The weight-for-age, length-for-age and weight for-length were analyzed in correlation tables.

Results

Table (1) illustrate that the mean age of the infants in months was (11.83), while gender distribution was 43% boys and 57% girls. The mothers' mean age was (24.92)**,** with mean age of 3,17 years. 48.5% of the mothers had middle education, 38% were illiterate, and 85.5% of them were house wives. More than half of families (52.5%) had sufficient monthly income, and 81.5% of the mothers' nutritional knowledge sources were family members and relatives.

As shown in **table 2,** nearly half of the mothers (48%) had initiated breast-feeding within one hour and 57.5% of them had exclusively breast-fed their babies for 6 months, while 90% of them considered regurgitation of small amount as normal. Seventy one percentage of mothers introduced liquid diet as first weaning food. Only 10.5 % of mothers kept 5-7 days interval between two different types of weaning food, and 76% of them followed family traditions before starting weaning. Only 14% of mothers didn't check their infants weight per age, and 82% were periodically take their infants to pediatrician.

As observed in **table 3,** good feeding practices was found in 70.5% of the mothers, forty one of mothers practiced badly in weaning their infants, while (59%) of them had good weaning practices. 84% of mothers had good follow-up practices, compared to only16 % had bad follow-up practices. All the infants (100%) had good nutritional status.

Table (4) shows the correlation between infants' age and their weight, height and chest circumference measurements. The infants' weight-for-age was assessed using Pearson correlation (r-value=.347 and p-value= .000), and the relation was statistically significant and fell within the normal range. According to the height-for age correlation, it was statistically significant (p = .000). Infants age was statistically significant with their chest circumference (p=.000). Height-for weight correlation was statistically significant (p=0,000, r=.750).

As regard mothers' education, **table 5** shows that mothers' feeding practices was statistically significant with mothers' educational level (p=.000). The relation between mothers' weaning practices and their education was statistically significant. Regarding the mothers' follow-up practices, there was a statistically significant difference with mothers' education.

Regarding mothers' occupation, **table 6** shows that there was no statistically significant difference between mothers' feeding practices and mothers' occupation, while the relation between mothers' weaning practices and mothers' occupation was highly statistically significant (p=.000). Regarding the mothers' follow-up practices, it had a highly statistically significant relation with mothers' occupation.

Table (7) shows that there was a statistically significant difference between mothers' weaning practices and family income (p=.000), while the relation between mothers' feeding practices and family income wasn't statistically different. Regarding the relation between mother's follow-up and family income, it was highly statistically different (p= .000).

Discussion:

It is highly desirable that breast-feeding is to be initiated soon after birth, within the first thirty minutes of delivery. The findings of this study revealed that 48% of mothers initiated breast feeding within one hour, this finding was in line with Musaiger[(9)] who reported that 39.8% of Bahraini mothers initiated breast feeding at the first hour of delivery. Also Radwan[(10)], in a study conducted at United Arab Emirates, mentioned that 80.6% of mothers put their infants on their breast within one hour after delivery.

The present study found that 57.5% of mothers were exclusively fed their babies for 6 months, this finding was in contrast with the study of Motee[(11)] in Mauritius founded that only17.9% of mothers practiced exclusive breast feeding (EBF) for the first 6 months , and Radwan[(10)] who reported that only 25% of infants had been exclusively breast-fed for 6 months. On the other hand, Higher rates of exclusive breastfeeding have been reported in Norway by Lande[(12)], who found that 42% of the infants were exclusively breastfed for 6 months. UNICEF[(13)] mentioned that developing countries such as East Asia and Pacific which have the highest rate of exclusive breastfeeding (43.0%) followed by Eastern and Southern Africa (41.0%).

In the current study, less than half (43%) of the infants were given weaning food from 4-6 months such as water with or without sugar, the reasons given by mothers for the introduction of liquids early were based on the mothers' own perceptions that their infants were not satisfied with breast milk alone, their infants were always crying, their infants were not sleeping, or that their infants were hungry. This finding was in line with Hotz[(14)] from rural Malawi, who reported that about half of the mothers had given non-nutritive liquids mostly water other than breast milk to their infants before they had reached four to six months of age. In another study by Mushaphi [(15)], it was observed that most mothers were giving pre-lacteals ranging from water or infant formula to herbal tea before their infants reached 6 months age.

The current study findings showed that 81.5% of the mothers' nutritional knowledge sources were family members and relatives, while 18.5% of them received their nutritional knowledge from health personnel. This was in line with the study of Mushaphi [(15)] indicated that 13.5% of the mothers received their education by health workers or nurses. So, whether the mothers were received health education from health personnel or not seemed not to influence their infants' nutritional status as the current study showed that 100% of infants had good nutritional status. Also, in another study in kingdom of Saudi Arabia conducted by Hanafi[(16)] who reported that motivation to breastfeed by grandmothers, mothers and other relatives in the family was a predictor of change and improve the knowledge, attitude and practice of mothers' about breastfeeding.

In the present study, there was a positive correlation between infant weight for age and length for age, these result could be due to that more than two thirds (68.5%) of the infants in the current study were under 12 months and were still being breast-fed at the time of study. This findings was in line with the study of Mushaphi [(15)]who found that 90% of the infants had a normal WAZ, and 78,4% of the infants having a normal LAZ, similar observation was found with the findings of the National Food Consumption Survey, Vaahtere [(17)] revealed that weight-for-age and length-for-age deficits were found to be considerably higher among the bottle-fed infants than among the breast-fed infants. It is also known that breast-fed infants are generally leaner than formula-fed infants at the age of 12 months.

The results of the present study revealed that mothers' breast feeding and weaning practices were statistically significant in relation to mothers' educational level (p=0.000). Chaudhry[18] in his study conducted in Lahore supported these findings and reported that significant association was observed between feeding, weaning practices and educational status of the mothers. Literate, under secondary and higher educated mothers, their feeding and weaning practices were significantly better than mothers with lower levels of education and illiterate (P=0.004). In the same context, Radwan[10] reported that Mothers' education level was significantly related to the breastfeeding practice (P<0.001), Also, Shazia[19] reported that there was no definite association of socioeconomic condition of mothers and their knowledge about feeding practices except maternal education.

The present study shows that mothers' breast feeding practices and family income wasn't statistically significant different as 78.9% of mothers with insufficient family income had good breast feeding practices than mothers with sufficient income. This was in agreement with Onah[20], who reported that socioeconomic status had inverse association with breast feeding practice. Higher socioeconomic status was associated with lessened rate of breast feeding practice. This may be related to the notion of use of infant formula as a status symbol.

In the present study, there was no statistically significant difference between mothers' feeding practices and mothers' occupation, this finding was in line with Onah[20], who found in his study that occupation of mothers would most likely interfere with the practice of breast feeding. Mothers are more likely to be busy thereby hampering to some extent the preconditions for breast feeding practice. They may need to be better educated on the skill of expression of breast milk which their babies will be fed while they are unavoidably away.

Conclusion:

Breast-feeding, weaning and follow - up practices of the mothers had significant effect on the infants' nutritional status outcome. Nutrition surveillance is important, particularly in this age group; it measured the success of feeding, weaning practices that aimed at improving the infants' health status.

Recommendations:

- Conducting educational program for mothers regarding importance of good feeding and weaning practices at maternal and child health centers.
- Healthy communication with mothers through mass media will be useful in enhancing and promoting mothers' knowledge regarding feeding and weaning practices.

Table (1): Socio-demographic characteristics of mothers and their infants

Characteristics	N (n=200)	(%)
Infant age in months		
6-12	137	68.5
13-18	63	31.5
Mean ± SD	11.83±4.62	
Sex		
Male	86	43.0
Female	114	57.0
Birth order		
First	108	54.0
Second	50	25.0
Third	21	10.5
Forth or more	21	10.5
Mothers age in years		
Mean ± SD	24.92±3.178	
Mother Education		
Illiterate	20	38.0
Middle	97	48.5
Secondary	16	8.0
University	67	33.5
Mother Occupation		
House wife	171	85.5
Official employer	25	12.5
Private employer	4	2.0
Family monthly income		
Sufficient and save	0	0.0
Sufficient	105	52.5
Insufficient	95	47.5
Family Type		
Independent	159	79.5
Followed	4	2.0
Extended	37	18.5
Mother's nutritional knowledge sources		
Health team personnel	37	18.5
Radio/T.V.	0	0.0
Books and journals	0	0.0
Family members/ Relatives	163	81.5
friends	0	0.0
Number of children in family		
One	90	45.0
Two-three	89	44.5
Four or more	21	10.5

Table (2): Mother's feeding, weaning and follow-up practices

Breast Feeding practices	N (n= 200)	(%)
Did you initiate breast feeding within one hour of the child birth?		
Yes	96	48.0
No	104	52.0
Have you breast fed the baby exclusively for 6 months?		
Yes	115	57.5
No	85	42.5
Did you practice demand feeding?		
Yes	129	64.5
No	71	35.5
Did you feed your baby with expressed breast milk?		
Yes	28	14.0
No	172	86.0
Do you consider regurgitation of small amount of feed as normal?	180	90.0
Yes	20	10.0
No		
Did you give breast feed along with ORS when the child had diarrhea?	154	77.0
Yes	46	23.0
No		

Weaning practices	N	%
Did you give weaning foods before 4-6 months?		
Yes	86	43.0
No	114	58.0
Did you use liquid diet as first weaning food?		
Yes	142	71.0
No	58	29.0
Did you keep 5-7 days interval between two different types of weaning food?	21	10.5
Yes	179	89.5
No		
Did you include fruits and boiled mashed vegetables in your babies' diet between 8-12 months?	97	48.5
Yes	103	51.5

No		
Have you observed any food allergies while weaning your baby?		
Yes	110	55.0
No	90	45.0
Is there any cultural or family tradition to be followed before starting the weaning food?		
Yes	153	76.5
No	47	23.5
Did you observe any psychological problem for your baby while weaning?		
Yes	114	57.0
No	86	43.0
Did you give soft mixture of rice and milk as complementary food?		
Yes	196	98.0
No	4	2.0
Did you use a spoon while giving complementary feed?		
Yes	200	100.0
No	0.0	0.0

Follow-up practices	**N**	**%**
Do you check the weight of your infant as per age?		
Yes	172	86.0
No	28	14.0
Did you get any health education regarding feeding practices from health personnel?		
Yes	37	18.5
No	163	81.5
Did you take your infant to pediatric in regular intervals?		
Yes	164	82.0
No	36	18.0

Table (3): Total score of Mother's feeding, weaning, follow-up practices and infant's nutritional score

Mother's practices	N(n= 200)	(%)
Mother's breast feeding practices		
▪ **Good practice**	141	70.5
▪ **Bad practice**	59	29.5
Mother's weaning practices		
▪ **Good practice**	118	59.0
▪ **Bad practice**	82	41.0
Mother's follow-up practices		
▪ **Good practice**	168	84.0
▪ **Bad practice**	32	16.0
Infant's nutritional score		
▪ **Good nutrition**	200	100.0
▪ **Malnutrition**	0	0.0

Table (4): Correlation between infants' age and their weight, height and chest circumference measurements

Variable	Infant age (months)	Weight (Kg)	Height (Cm)	Chest circumference
Infant age				
▪ **r-value**	1	.347**	.750**	.589**
▪ **P-value**		.000	.000	.000
Weight				
▪ **r-value**	.347**	1	.560**	.613**
▪ **P-value**	.000		.000	.000
Height				
▪ **r-value**	.750**	.560**	1	.762**
▪ **P-value**	.000	.000		.000
Chest circumference				
▪ ***r-value***	.589**	.613**	.762**	1
▪ ***P-value***	.000	.000	.000	

Table (5): Relationship between mother education and their practices in feeding, weaning and follow-up

Mother's Practices	Mother Education (n= 200)							
	Illiterate		Middle		Secondary		University	
	No	%	No	%	No	%	No	%
Mother's breast feeding practices								
▪ **Good practice**	0	0.0	62	63.9	16	100.0	63	94.0
▪ **Bad practice**	20	100.0	35	36.1	0	0.0	4	6.0
P = .000								
Mother's weaning practices								
▪ **Good practice**	0	0.0	64	66.0	16	100.0	38	56.7
▪ **Bad practice**	20	100.0	33	34.0	0	0.0	29	43.3
P = .000								
Mother's follow-up practices								
▪ **Good practice**	20	100.0	97	100.0	0	0.0	51	76.1
▪ **Bad practice**	0	0.0	0	0.0	16	100.0	16	23.9
P = .000								

Table (6): Relationship between mother occupation and their practices in feeding, weaning and follow-up

Mother's Practices	Mother Occupation (n= 200)					
	House wife		Official employer		Private employer	
	No	%	No	%	No	%
Mother's breast feeding practices						
▪ **Good practice**	116	67.0	21	84.0	4	100.0
▪ **Bad practice**	55	32.0	4	16.0	0	0.0
	P = .108					
Mother's weaning practices						
▪ **Good practice**	114	66.7	0	0.0	4	100.0
▪ **Bad practice**	57	33.3	25	100.0	0	0.0
	P = .000					
Mother's follow-up practices						
▪ **Good practice**	147	86.0	21	84.0	0	0.0
▪ **Bad practice**	24	14.0	4	16.0	4	100.0
	P = .000					

Table (7): Relationship between family income and mother's practices in feeding, weaning and follow-up.

Mother's Practices	Family Income (n= 200)			
	Not sufficient		Sufficient	
	No	%	No	%
Mother's breast feeding practices				
▪ **Good practice**	75	78.9	66	62.9
▪ **Bad practice**	20	21.1	39	37.1
	P = .013			
Mother's weaning practices				
▪ **Good practice**	42	44.2	76	72.4
▪ **Bad practice**	53	55.8	29	27.6
	P = .000			
Mother's follow-up practices				
▪ **Good practice**	95	100.0	73	69.5
▪ **Bad practice**	0	0.0	32	30.5
	P = .000			

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