

Age at Weaning between WHO Recommendations and Malpractice in Sharkia Governorate

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Abstract:

Background: The introduction of complementary food during the first 6 months of infant's age known as early weaning. Early weaning occurs due to many factors. Determining these factors could help to overcome this faulty habit. **Objectives:** To assess the frequency of early weaning and to determine associated factors among mothers in Sharkia governorate - Egypt. **Method:** A cross-sectional study was conducted on 331 infants. Three healthcare facilities were selected to represent rural and urban areas. Participants' data regarding socio-demographic characteristics, the timing and causes of early weaning, non-nutritive sucking habits and the timing of first teeth eruption were collected via semi-structured questionnaire. **Results:** The study revealed that the highest percentage (47%) of age at weaning for infants' in Sharkia governorate was 3-5 months. Two hundreds and thirteen mothers (64.4%) in the sample had weaned their babies before the age of 6 months, (17.2%) of them weaned their babies before the age of 3 months. Multivariate logistic regression analysis revealed that infants had a time of 1st tooth eruption before 6 months, their mothers did not receive follow up postnatal care from the affiliated health unit, their mothers work for more than 6 hours per day or for more than 5 days per week, had birth weight < 3500 g, were breastfed and had non-nutritive sucking habits were more likely to be weaned before the age of 6 months. **Conclusion:** There is a large gap between WHO's recommendations and infants' feeding practice in Sharkia governorate. So further public health interventions are required to overcome this gap.

Keywords: complementary feeding, early weaning, infants, Sharkia governorate.

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Introduction:

The introduction of semisolid or solid food to breastfed or formula-fed babies is called weaning.¹ The world health organization recommends exclusive breastfeeding or formula feeding (in infants receiving formula milk) for the first six months of life to achieve optimal growth, development, and health.²

Safe complementary food with breast milk continuation to the age of two years is mandatory to meet the infant's evolving nutritional requirements.³

Early weaning before age of six months increases the incidence of respiratory infections, gastrointestinal infections, and hospital admission because of diarrhea.⁴

Various factors have been associated with mothers' timing of the introduction of complementary feeding. The early weaning has been associated with specific infant characteristics such as birth weight, delivery method, the baby order, and pacifier use; as well as maternal characteristics, including their age,

education, occupation; socioeconomic status and location of residence.⁵

Routine postnatal follow up care one of the maternal factors that prolong the duration of exclusive breastfeeding by providing the comprehensive essential obstetric care (CEOC) through the 42 days following delivery by skilled medical provider to the mother and the baby, so could help the mother to overcome any obstacles to continue breastfeeding by patient education messages about the importance of exclusive breastfeeding and proper timing of weaning.⁶ Effective management of lactation problems in the early postpartum period is important to prevent early weaning.⁷

The prevalence of early weaning before the age of 6 months for infants in Egypt isn't a little prevalence, as the Egyptian demographic and health survey (EDHS) revealed that about 4% of the infants aged 3 months and one-third of the infants aged 4-5 months were given complimentary food.⁸ The study aimed to improve general health and nutritional status of the infants through achieving the study objectives which are assessing the frequency of early weaning and investigating which factors are associated with it among mothers in Sharkia Governorate.

Method

The study was a cross-sectional study. It was carried out throughout the period from May to October 2018. Zagazig district was selected to represent Sharkia governorate in Egypt. The district includes 34 family health units in rural and urban areas. Sampling was taken randomly by selecting one health center from the urban area, and two family health centers from a rural area. The sample size was calculated to be 331 infants including both breast and formula fed, based on early weaning prevalence in Egypt 31.9%⁸ and a total number of infants

in Zagazig district was 33111.⁹ Using an online open epi program ¹⁰ at a 95% confidence interval, 5% standard errors and power of the study 80%. Sample units were selected randomly from each health facility according to the total population in each facility by proportional allocation method.

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

Socio-demographic characteristics	N (331)	%
Mothers' age		
19-29-	165	49.85
Range (19 - 39)	166	50.15
Mean±SD (28.6±5.08)		
Mothers' Education		
Illiterate	38	11.5
Read and write	45	13.6
School education	98	29.6
University graduated	150	45.3
Mothers' Occupation		
Non-working (housewives)	143	43.20
Worker	54	16.31
Employee	66	19.95
	68	20.54
Residence		
Rural	90	27.2
Urban	241	72.8
Social class		
Low	72	21.8
Middle	117	35.3
High	142	42.9

The participants were attending health units during their infants' routine vaccination sessions; mothers were interviewed using a semi-structured questionnaire modified from a previous study done in Brazil.¹¹ The questionnaire consisted of socio-demographic assessment questions according to the scoring system modified from El-sherbini & Fahmy, (1983)¹², questions about the duration of exclusive breastfeeding, the timing of weaning, causes of early weaning, non-nutritive sucking habits (which includes pacifier use,

finger and tongue suckling) and the timing of first
Table (2): Univariate analysis of independent variables with regards to age at weaning among the studied infants:

Variable	Weaning				Total		OR* (95%CI)	p**
	<6 months		≥ 6 months		N (331)	%		
	N (213)	%	N (118)	%				
Residence								
Rural	66	73.3	24	26.7	90	27.2	1.8	0.024***
Urban	147	61	94	39.0	241	72.8	(1.03-2.99)	
Maternal education								
Illiterate	37	97.4	1	2.6	38	11.5	24.6	0.000***
Educated	176	60.1	117	39.9	293	88.5	(3.3-181.8)	
Maternal occupation								
Not work	91	63.6	52	36.4	143	43.2	1.1	0.451
Work	122	64.9	66	35.1	188	56.8	(0.67-1.66)	
Working days per week								
≤ 5 days	44	53.7	38	46.3	82	43.6	2.4	0.004***
> 5 days	78	73.6	28	26.4	106	56.4	(1.31-4.44)	
Working hours / day								
≤ 6 hours	62	55.9	49	44.1	111	59	2.8	0.001***
> 6 hours	60	77.9	17	22.1	77	41	(1.45-5.38)	
Social class								
Low	71	98.6	1	1.4	72	21.8	58.5	0.000***
Middle & high	142	54.8	117	45.2	259	78.2	(8.1-427.5)	
Postnatal care								
Yes	84	39.4	94	52.8	178	53.8	6.02	0.000***
No	129	84.3	24	15.7	153	46.2	(3.6-10.18)	
Infant sex								
Male	113	64.6	62	35.4	175	52.9	0.9	0.510
Female	100	64.1	56	35.9	156	47.1	(0.62-1.54)	
The baby order								
The 1 st infant	47	52.8	42	47.2	89	26.9	2.1	0.006***
The 2 nd and more infants	166	68.6	76	31.4	242	73.1	(1.19-3.21)	
Time of 1st tooth eruption								
< 6 months	119	76.8	36	23.2	155	46.8	2.88	0.000***
≥ 6 months	94	53.4	82	46.6	176	53.2	(1.79-4.64)	
Passive smoking								
Yes	26	81.2	6	18.8	32	9.7	2.6	0.025***
No	187	62.5	112	37.5	299	90.3	(1.04-6.5)	
Type of labor								
Normal vaginal delivery	161	70	69	30	230	69.5	2.2	0.001***
Cesarean section	52	51.5	49	48.5	101	30.5	(1.36-3.56)	
Birth weight (g)								
< 3500	137	71	56	29	193	58.3	2.1	0.002***
≥ 3500	76	55.1	62	44.9	138	41.7	(1.26-3.15)	
Gestational age at birth								
Pre-term	2	12.5	14	87.5	16	4.8	14.2	0.000***
Term & post-term	211	67	104	33	315	95.2	(3.17-63.7)	
Feeding type from birth								
Exclusive breastfeeding	168	68.9	76	31.1	244	73.7	2.06	0.004***
Artificial or Mixed feeding	45	51.7	42	48.3	87	26.3	(1.25-3.4)	
Pre-lacteal feeding								
Yes	151	67.1	74	32.9	225	68	1.45	0.081
No	62	58.5	44	41.5	106	32	(0.9-2.33)	
Non-nutritive sucking habits								
Yes	100	82	22	18	122	36.9	3.86	0.000***
No	113	54.1	96	45.9	209	63.1	(2.26-6.59)	

*OR =Odds Ratio, CI=Confidence Interval
 ** Chi-Square Test, Fisher’s exact test was used when expected count is less than 5
 ***Statistically significant

Table (3): Multivariate logistic regression analysis for predictors of early weaning among the studied group:

Independent factors	B*	S.E**	Wald	O.R*** (95% C.I)	P value
Residence (Rural)	0.288	0.654	0.194	1.334 (0.37-4.81)	0.660
Maternal education (Illiterate)	1.672	2.032	0.122	0.09 (0.00-0.61)	1.000
Working days per week (> 5)	1.080	0.491	4.838	2.94 (1.12-7.72)	0.028****
Working hours per day (> 6)	1.639	0.529	9.597	5.15 (1.83-14.53)	0.002****
Social class (Low)	-3.42	4.034	0.056	0.02 (0.00-0.93)	1.000
Postnatal care (No)	2.158	0.530	16.56	8.65 (3.06-24.45)	0.000****
The baby order (Subsequent infants)	0.373	0.682	0.299	1.45 (0.38-5.53)	0.585
Time of 1 st tooth eruption (< 6 months)	2.21	0.535	17.08	9.11 (3.20-25.99)	0.000****
Passive Smoking (Yes)	-0.29	0.947	0.096	0.746 (0.12-4.77)	0.757
Type of labor (Normal vaginal delivery)	0.233	0.522	0.200	1.26 (0.45-3.51)	0.655
Birth weight (< 3500 g)	1.631	0.486	11.25	5.11 (1.83-14.53)	0.001****
Gestational age at birth (Pre-term)	2.291	1.481	2.395	9.89 (0.54-179.9)	0.122
Feeding type from birth (Exclusive breastfeeding)	1.158	0.523	4.902	3.18 (1.14-8.87)	0.027****
Non-nutritive sucking habits (Yes)	1.145	0.478	5.747	3.14 (1.23-8.01)	0.017****

* *Beta coefficient*, ***Standard Error*, ****Odds Ratio, Confidence Interval*, *****Statistically significant*

teeth eruption. Also, the researchers asked about whether the mother had received postnatal care from the affiliated health unit or not.

Administrative approval: The study was approved by the Zagazig health directorate. An official permission letter was obtained from the authority and directed to health centers included in the study.

Ethical approval

Informed consent was obtained from mothers after a simple clarification of the study objectives and methodology.

Statistical analysis

Data were analyzed using the Statistical Package for Social sciences (SPSS) software (Statistical Package for the Sociable Sciences, version 20, SPSS Inc. Chicago, IL, USA).

Qualitative data were expressed as number and percentage and analyzed by using Chi-square test (X^2) and Fisher’s exact test was used when expected count is less than 5, to detect the relation between different qualitative variables. Quantitative data were expressed as mean \pm SD. Multivariate logistic regression were done to identify predictors of early weaning.

Results

Regarding socio-demographic characteristics, more than half of the studied mothers were urban residents, half of them aged ≥ 29 years old and near half of them were housewives, highly educated and of high social class (Table 1).

The study revealed that two hundreds and thirteen mothers (64.4%) in the sample had weaned their babies before the age of 6 months. Fifty-seven (17.2%) of them weaned their babies before the age of 3 months (Figure 1).

In univariate analysis, the majority of mothers who weaned their babies early (before the age of 6 months) were rural residents, illiterate, worked for more than 5 days per week or more than 6 hours per day, passive smokers, had low social class, delivered their babies vaginal and did not receive post-natal care and these results were statistically significant (Table 2).

Reported mothers recall about their main cause of early weaning their babies. Causes were attributed to mothers' occupation (39%), followed by the social concept and perceived milk insufficiency (19.7% and 18.8% respectively) (Figure 2). Multivariate logistic regression analysis showed that mothers work for more than 6 hours per day or for more than 5 days per week were more likely to wean their infants early (Table 3).

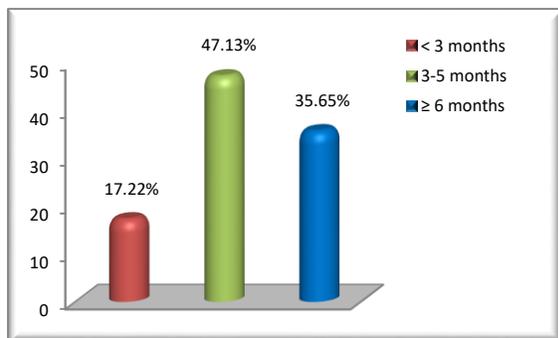


Figure (1): Distribution of the studied infants according to their age at weaning

The current study shows that percentage of infants received complementary food before the age of 6 months was 2 folds more among the 2nd infant than the first infant and among those with birth weight < 3500 g; also, and was 14 folds among preterm babies than term & post-term and these differences were statistically significant (Table 2).

Non-nutritive sucking habits ($P < 0.001$), exclusive breastfeeding ($P = 0.004$), and time of eruption of the first tooth ($P < 0.001$) were associated with early weaning. There were no significant associations between infant sex, pre-lacteal feeding and early weaning (Table 2).

Multivariate logistic regression analysis revealed that infants had a time of 1st tooth eruption < 6 months, their mothers did not receive post-natal care, their mothers work for more than 6 hours per day or for more than 5 days per week, had birth weight < 3500 g, were breastfed and had non-nutritive sucking habits were more likely to be weaned before the age of 6 months (Odds ratio = 9.1, 8.7, 5.15, 2.9, 5.11, 3.18, 3.14) respectively (P -value < 0.05) (Table 3).

Discussion

Despite the WHO's recommendations and the clear evidence of several complications on infants' health, the early introduction of complementary feeding remains common in both developed and developing countries.¹³

The current study has shown that a high proportion (64.4%) of the studied infants are given semisolid or solid foods prior to reaching 6 months of age with near one third of them are weaned before reaching the age of 3 months, a finding which implies a large gap between the WHO's recommendations and the infants' feeding practice in Sharkia Governorate. This was in concordance with a study conducted in

Saudi Arabia by Alzaheb¹⁴ who reported that (62.5%) of infants in Saudi Arabia were weaned before reaching the age of 6 months. However, higher rates of early weaning were found in various previous studies in the Middle East; as 65% of infants were reported to have received solid foods at the age of 3 months in the United Arab Emirates¹⁵; 41.6% of infants received solid foods by the age of 4 months in Lebanon¹⁶; while in Turkey 35% of babies received complementary foods by the age of 5 months¹⁷; and 30.4% of infants received solid foods by the age of 6 months in Kuwait.⁵

A similar finding was reported by various studies in developed countries, such as 70% of infants in Canada, 63% in Finland, 45% in New Zealand, and 40% in Australia received complementary feeding before reaching the age of 6 months.¹⁸

Maternal occupation was the cause of early weaning among 39.4% of infants included in the current study, moreover; the multivariate logistic regression analysis revealed that working for more than 5 days per week or more than 6 hours per day as highly significant determinants of early weaning, This was in concordance with a study conducted in Kuwait by Dashti et al.,¹⁹ who reported that 35% of mothers weaned their infants early because they had returned to work. Also, agree with a study conducted in Lebanon by Batal et al.,²⁰ who revealed maternal employment status as a highly significant determinant of early weaning.

Also, about 19% of the mothers included in the current study weaned their infants early due to perceived milk insufficiency. This is in agreement with a study conducted by karral et al.,²¹ who found a strong association between perceived milk insufficiency and early weaning. Perceived milk insufficiency is the belief held by the breastfeeding mother that the

amount or quality of her milk is insufficient to meet her baby’s needs.²²

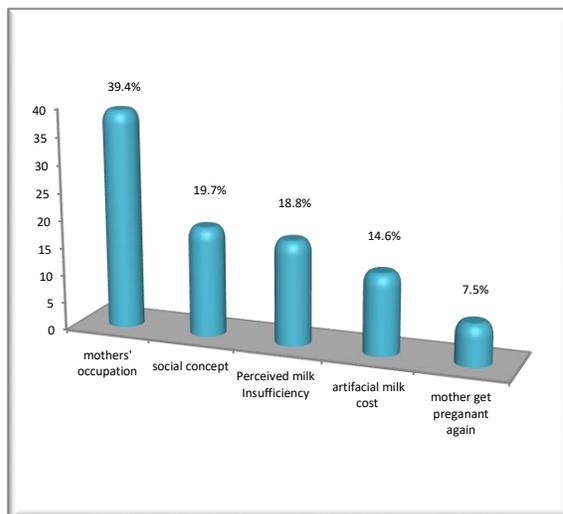


Figure (2): Mothers reporting the main causes of early weaning.

The current study found a significant association between early weaning and maternal education as the majority of illiterate mothers weaned their infants early. Similarly, Alzaheb¹⁴ reported that Saudi Arabian mothers with fewer than 12 years of education were associated with early weaning. This disagrees with a study conducted in Kuwait that did not find any association between mothers’ education levels and the timing of their introduction of complementary foods.¹⁸

This study reported that mothers had low social class had a 58.5 times greater likelihood of introducing complementary feeding early than those who had high and middle social class. A similar association was found by Alzaheb.¹⁴ However, a study in the context of China aimed to investigate the factors associated with the early weaning, but no association was found between the early weaning and low social class.²³

Regarding infant sex, there is no significant difference between both sex regarding early weaning. This agrees with

the results reported by Betoko et al.,²⁴ and disagrees with a study conducted in France by Bournez et al.,²⁵ who found that Boys were more likely than girls to be introduced to complementary feeding before the age of 3 months and relate this to the large size and higher energy requirements of male infants included in their study.

The present study has also found baby order (2nd and more) and breastfeeding since birth to be influencing factors with regard to the early introduction of complementary feeding. This was in concordance with a study conducted in France by Bournez et al.,²⁵ who reported the same association, as maternal experience could also be related to an intergenerational transmission of infant care and feeding habits, which may differ by social group.

The current study has also found normal vaginal delivery to be an influencing factor with regard to the early weaning. No significant relationship of this kind was found by a study conducted in the United Arab Emirates by Gardner et al.¹⁵ Also, this disagrees with another study conducted in Saudi Arabia by Alzaheb¹⁴ who found cesarean section delivery to be an influencing factor with regard to the early weaning. One possible explanation for this may be most of working mothers included in the current study were working at Non-governmental organizations which give only two weeks' vacation for the mothers give birth by a normal vaginal delivery which forces them to start introduction of complementary feeding early.

The multivariate logistic regression analysis revealed that first tooth eruption before the age of 6 months was highly significant determinant of early weaning in the current study. A similar association was reported by a study conducted in Brazil by Lopes et al.¹¹ One possible explanation for

this may be the discomfort caused during breastfeeding by the presence of the erupted teeth.

The current study reported a significant association between non-nutritive sucking habits and early weaning. This agrees with Miotto et al.,²⁶ who found that there is a greater chance of early weaning among infants had non-nutritive sucking habits.

One of the key findings emerging from this study is that mothers who didn't receive post-natal care had a 6 times greater likelihood of introducing complementary feeding early than those who received post-natal care. This agrees with Bournez et al.,²⁵ who reported a similar association. A study conducted in France by Wagner et al.,²⁷ reported that attending one post-natal care session was associated with a lower probability of early weaning.

Conclusion

Nearly two-thirds of the sampled infants had weaned before the age of 6 months. It is therefore apparent that further public health interventions are required by applying postnatal care and health education sessions about the importance of exclusive breastfeeding in the first six months of infant's age. Governmental laws should be modified and applied especially in private work sectors to enable mothers to continue breastfeeding for longer periods.

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