

Weaning Process in Breastfed Infants Compared with Artificially Fed: An Assessment Study

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Abstract

Introduction: Weaning is the process of expanding the diet to include foods and drinks other than breast milk or infant formula. **The aim of the study:** The study aimed to compare weaning process in breastfed versus artificially fed infants. **Research design:** Descriptive-comparative design was utilized in carrying out this study. **Subject and Setting:** A purposive sample including 200 mothers attended the Child Care Center Castle in Sayeda Aisha over a six months period and their accompanying infants. **Tools:** of study involved; **I-** Predesigned questionnaire format to assess characteristics of the infants and their mothers, to assess mother's knowledge regarding breast-feeding, bottle-feeding. **II-** Children's assessment sheet to assess their physical and physiological growth and development and compare with their normal peers. **Results:** The result of the study showed that more than one third of the bottle-feeding mothers had average knowledge regarding weaning process versus the breast-feeding mothers had poor knowledge with statistically significant differences. **Conclusion:** The current study showed that, mothers' knowledge regarding weaning process was poor in breastfed compared with artificially fed infants. **Recommendation:** Improve mothers' awareness and practice regarding breast feeding, artificial feeding and proper weaning.

Keywords: Weaning Pattern, Breast Feeding, Complementary Feeding, Artificial Feeding, Mothers, Children, Nursing.

Introduction

Weaning is considered as a transitional period to change from liquid to a solid diet. The feeding behavior changes from sucking to chewing and biting and the obligatory introduction with the mother or other caretaker changes to independent feeding. The time of weaning an infant start when growth faltering and nutritional deficiencies manifest in children and yet it is often the time when foods are given to provide the volume necessary to keep the child from being hungry without regard to the nutritional quality of the transitional foods (Vyas et al., 2014).

Weaning plays a major role in determining the nutritional status of a child. Poor weaning practices during infancy and early childhood, resulting in malnutrition, contribute to impairment of cognitive and social development, poor school performance and reduced productivity in later life (Udoh & Amodu, 2016)

Factors that affect weaning vary according to socioeconomic condition of the population like

education, culture, norms and believes. Those factors also vary according to regional distribution of the world. In United States average weaning age was from 2.5 to 3 years. The common reason for starting the weaning process was said to be "child-led" and that was accomplished slowly. Comprehensive nursing was infrequent. In Kuwait, the mothers were using artificial feeding immediately after birth. The breast feeding rate was 26% while bottle feeding rate was 42%. Between 3 months to 5 months of ages, fruit juices, cereal products like biscuits and cereal given to the child (Al-Awadi & Amine, 1997)

Introduction of timely, adequate and balanced weaning food is perhaps one of the most important single and direct remedial measures to combat infant's malnutrition. Not only the appropriate timings, but appropriate quantity and quality in a hygienic environment, along with increased maternal interaction time also have a desired positive effect on the growth of young children (WHO, 2021).

The first aspect that makes the weaning begins that when the infant shows signs of readiness for solids as, sitting-up unassisted, grabbing items

and putting them in his mouth, making chewing motions, showing interest in food. Once the baby demonstrates all of these signs of readiness and is at least 6-months-old, it is time to begin. It is recommended to wait until the baby is at least 6-months-old in order to reduce the chance of developing food allergies, allow for a more mature gut, and wait for the presence of enzymes necessary for digesting solid foods gap (WHO, 2019).

The nurse allows opportunities to educate parents regarding the nutritional needs of their children and to prepare them for the addition of solid foods. This includes education concerning what infants need and do not need. (Arafat, 2017).

Significance of the study

In cultures where there is no social pressure to wean, children usually stop breastfeeding or receiving their mother's milk between 2½ and under 5 years old, weaning usually happens very gradually, often without any fuss, process, or effort (Dettwyler and Stuart-Macadam, 1995).

There were approximately 10 million annual deaths of under-five year old children. Over one third of under-five mortality is caused by malnutrition related to inadequate complementary feeding. Initiating safe and nutritionally adequate complementary foods at 6 months is crucial to achieve optimal growth, development and health (UNICEF, 2012).

World Health Organization (WHO) recommends early initiation of breastfeeding, followed by exclusive breastfeeding for the first 6 months and weaning through introducing complementary feeding timely and adequate in amount, frequency, consistency, and variety to address the nutritional needs of the growing infant at 6 months of age with continuing breast feeding up to 2 years (WHO, 2013).

Aim of the study

This study aimed to compare weaning process in breastfed versus artificially fed infants.

Research question

- What is the weaning process in breastfed versus artificially fed infants?

Subject and Method

The subject and methods of the current study discussed under the following four (4) designs:

I. Technical design

The technical design included research design, setting, subject, and tools for data collection.

Research Design

Descriptive-Comparative design was used to conduct this study.

Study Setting

The study was conducted at Child Care Center Castle in Sayeda Aisha/ Cairo. The building consisted of two floors, 1st floor had outpatients clinics (Pediatric, antenatal care, dental clinic, pharmacy and phlebotomy). 2nd floor had the administrative offices and orphanage.

Subject

The subject of this study was purposive sample that composed of 200 mothers (107 BF and 93 AF) attended the above mentioned setting over a six months period and their accompanying children in outpatient clinic.

Sample equation

$$= \frac{N \times p(1-p)}{[N-1 \times (d2 \div Z2)] + P(1-P)}$$

Where:

- P= 0.5
- 1-P= 0.5
- D= 0.05
- Z=1.96

Inclusive criteria

Mothers having children from both genders in weaning phase and free from any chronic diseases or congenital anomalies.

Data collection tools:

Tool I:

Pre-designed Questionnaire Format: that was designed by the researcher in the light of related literature and studies. It was written in simple Arabic language to suit the understanding level of the study subjects in form of open and close ended questions; it was consisted of the following:

Part 1: Characteristics of the studied mothers: (age, level of education and mothers' work status).

Part 2: Characteristics of the studied children: (gender, age, child rank, birth weight, physiological & physical growth, health condition).

Part 3: Mother's knowledge regarding weaning process (definition, time of weaning, principles, problems, reported practice, and care).

❖ Scoring System

Mothers' answers were checked with model key answer and accordingly their knowledge was categorized as: Good (> 70%), Average (50% ≤ 70%) and Poor (< 50%).

Tool II:

Children's assessment sheet to assess their physical and physiological growth and development and compare the results with their normal peers (*CDC, 2017*).

II. Operational design

The operational design for this study consisted of three phases, namely preparatory phase, pilot study, and field work.

A. Preparatory Phase

This phase included reviewing of literature related to weaning process in breastfed versus artificially fed infants. This was served also to develop the study tools for data collection.

Content validity: It was ascertained by experts in pediatric nursing to test its content validity. Their opinions elicited regarding the format, layout, consistency, accuracy, completeness. Minor modifications were suggested.

Content reliability: The tool was tested to ensure that an assessment tool produces stable and consistent result overtimes by Alpha Cronbach test (0.84).

$$\alpha = \frac{N \cdot r}{1 + (N - 1) \cdot r}$$

N: is equal to the number of items and \bar{r} the bar is the average inter-item correlation among the items.

B. Pilot Study

Pilot study was carried out on 10% of mothers (20). In order to test the applicability of the constructed tools and the clarity of the included questions. The pilot has also served to estimate the time needed to fill in the study tools. According to the results of the pilot study, some

corrections and omissions of items were performed as needed. Then mothers involved in the pilot study were excluded from the main study later.

C. Fieldwork

The researcher was available two days per week in the study setting from 9 A.M. to 1 P.M. every Saturday and Tuesday over 6 months period started in June 2019 till the end of November 2019. Each mother was individually interviewed using the study tool for 20 minutes. The researcher first explained the purpose of the study after introducing herself.

III. Administratedesign

Approval was obtained through an issued letter from the Dean of Faculty of Nursing, Ain Shams University to director of the previously mentioned setting.

Ethical Consideration

Ethical approval from research ethics committee at faculty of Nursing/ Ain Shams University was obtained and verbal approval from the mothers before inclusion in the study; a clear and simple explanation was given according to their level of understanding, physical and mental readiness. They secured that all the gathered data was confidential and used for research purpose only.

IV. Statistical analysis

Data collected from the studied sample was revised, coded and entered using PC. Computerized data entry and statistical analysis were fulfilled using the statistical package for social sciences (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies, percentages. Chi-square test (X^2) was used for comparisons between qualitative variables and correlation sufficiency was used to test correlation between variables. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

- P value <0.05 was considered significant.
- P value <0.001 was considered as highly significant.
- P value >0.05 was considered insignificant.

Limitation of the study:

Very limited studies and references related to the study either nationally or internationally.

Results:

Table (1): shows that 51.4% and 46.2% of both breast feeding and bottle feeding mothers their age ranged from 25 to less than 30 years, 31.8% and 29% of them had basic education, 70.1% and 59.1% of them were housewives and 72% and 84.9% did not attend training courses about weaning.

Table (2): shows that, 40% and 46.1% of both breast feeding and bottle feeding children their age ranged between 12 ≤18 months, 57.9% and 54.8% of them were males and 44% and 44.1% of them ranked as the first child in their family.

Table (3): shows that, 40.2% of the breast feeding mothers had average total knowledge regarding exclusive breast feeding versus 41.9% of the bottle feeding mothers had poor knowledge regarding exclusive breast feeding.

Table (4) shows that, 43.2% of the bottle feeding mothers had average knowledge regarding artificial feeding versus 35.5% of the breastfeeding mothers had poor knowledge regarding artificial feeding.

Table (5): shows that, 39.3% and 29.9% of the bottle feeding mothers and breast feeding had average knowledge regarding weaning process.

Table (1): Distribution of the studied mothers according to their characteristics (n=200).

Variables	Breast feeding (n=107)		Bottle feeding (n=93)		X ²	P Value
	No	%	No	%		
Mother's age in years						
18 < 20	18	16.8	15	16.1		
20 < 25	29	27.1	30	32.3		
25 < 30	55	51.4	43	46.2	0.78	0.9
30 < 35	3	2.8	3	3.2		
> 35	2	1.9	2	2.2		
X̄±SD		26.9±2.1		27.2±3.2		
Mothers' level of education						
Illiterate	21	19.7	15	16.1		
Read and write	30	28.0	20	21.6		
Basic	34	31.8	27	29.0	4.60	0.32
Technical	12	11.2	19	20.4		
University	10	9.3	12	12.9		
Occupation						
Working	32	29.9	38	40.9		0.10
Do not work	75	70.1	55	59.1	2.62	
Attended training courses about weaning						
Yes	30	28.0	14	15.1	4.89	0.03*
No	77	72.0	79	84.9		

Table (2): Distribution of the studied children according to their characteristics (n=200).

Variables	Breast feeding (n=107)		Bottle feeding (n=93)		X ²	P Value
	No	%	No	%		
Child Age in months						
Less than 6	17	16.0	10	10.8		
6< 12	35	32.7	26	28.0		
12< 18	43	40.0	43	46.1	1.20	0.75
18≤24	12	11.3	14	15.1		
$\bar{X}\pm SD$	12.3±0.6		13.8±1.2			
Gender						
Male	62	57.9	51	54.8	0.19	0.65
Female	45	42.1	42	45.2		
Child Ranking						
1 st	47	44.0	41	44.1		
2 nd	33	30.8	37	39.8		
3 rd	15	14.0	12	12.9	5.41	0.25
4 th	8	7.5	2	2.2		
5 th	4	3.7	1	1		

Table (3): Distribution of the studied mothers according to their total knowledge regarding exclusive breastfeeding (n=200).

Knowledge	Breast feeding (n=107)		Bottle feeding (n=93)		X ²	P Value
	No	%	No	%		
Good	37	34.6	22	23.7		
Average	43	40.2	32	34.4	6.67	0.03*
Poor	27	25.2	39	41.9		

Table (4): Distribution of the studied mothers according to their total knowledge regarding artificial feeding (n=200).

Knowledge	Breast feeding (n=107)		Bottle feeding (n=93)		X ²	P Value
	No	%	No	%		
Good	26	24.3	23	24.8		
Average	38	35.5	40	43.2	9.03	0.01*
Poor	43	40.2	30	32.0		

Table (5): Distribution of the studied mothers according to their total knowledge regarding weaning process (n=200).

Knowledge	Breast feeding (n=107)		Bottle feeding (n=93)		X ²	P Value
	No	%	No	%		
Good	30	28.0	23	24.7		
Average	32	29.9	37	39.3	6.91	0.03*
Poor	45	42.1	33	36.0		

Discussion

Concerning the characteristics of the studied mothers, (Table, 1), the current study revealed that, almost half of both breastfeeding and bottles feeding mothers their age ranged from 25: < 30 years, one third and more than one quarter of them have basic education, more than half of them are housewives and the majority of them did not attend training courses about infants' weaning.

These findings were similar with *Saeed et al., (2019)* study which entitled "Infant weaning knowledge and practice among mothers attending maternal and child healthcare center in Tor-Sinai City" where it was reported that, the majority of mothers' ages were from 20-35 years. However, finding of the study by *Saeed et al., (2019)* was not similar in relation to level of education where two thirds of them were secondary school education and more than one third of them were university education.

This could be due to variation in characteristics of the studied mothers.

Concerning the characteristics of the studied children, (**Table, 2**), the current study revealed that, more than two fifths of both breast feeding and bottle feeding children their age ranged between 12:< 18 months, half of them were males and more than two fifths of them ranked as the first child in their family.

These results were in the same line with *Nafee & Al-Dossary, (2016)* study which entitled "Exclusive breastfeeding, prevalence and maternal concerns: Saudi and Egyptian mothers" where it was mentioned that half of the studied children were males while the results were contradicted in relation to children's age and rank where half of the studied children their age ranged from 3 to 6 months and more than one third of them ranked as the first child in their family.

The researcher believes that this could be due to similarity in characteristics of the studied childrens.

Concerning the total mothers' knowledge regarding exclusive breastfeeding (**Table, 3**), the current study revealed that, two fifths of the breastfeeding mothers had average knowledge regarding exclusive breastfeeding and the bottle feeding mothers had poor knowledge regarding exclusive breastfeeding. This finding was supported with *Dallak et al., (2016)* study which in entitled "Breastfeeding Knowledge, Attitude, and Practices among Mothers Attending Health Centers in Sana'a City" where it was mentioned that, two fifths of mothers had moderate level of knowledge and almost one third had low level of knowledge, while less than one quarter of the mothers had high level of knowledge. This finding could be due to experience of artificially fed mothers with practice of bottle preparation and feeding compared with breastfeeding mothers' experience and vice versa.

Regarding the total mothers' knowledge about artificial feeding (**Table, 4**), the current study revealed that, more than two fifths of the bottle feeding mothers had average knowledge regarding artificial feeding versus two fifths of the breastfeeding mothers were having poor knowledge regarding artificial feeding.

This finding was similar to *Hassan et al., (2019)* study which entitled "Study the level of nutritional knowledge of mothers of breast and artificial feeding in Sharkia governorate" where it was reported that, the majority of mothers had low level of general knowledge about breast feeding and artificial feeding. Tendency of mothers to artificially fed could be due to their work, socio-economic standered and failure to manage their breast feeding problems.

Concerning the mothers' total knowledge about the weaning process (**Table, 5**), the current study revealed that, almost two fifths of the bottle feeding mothers had average knowledge regarding the weaning process versus two fifths of the breastfeeding mothers had poor knowledge.

This result was supported by *Folasade et al., (2017)* who studied "Infant weaning knowledge and practice among mothers attending infant welfare clinic in three primary healthcare centers in Ikenne local government area" where it was found that, the majority of the mothers had moderate knowledge level. This finding might reflect the need for antenatal care, mothers' health education and counseling about the weaning process of infants.

Conclusion

The current study showed that, mothers' knowledge regarding weaning process was poor in breastfed compared with artificially fed infants.

Recommendations

Based upon the results of the current study the following recommendations can be suggested:

- Improve mothers' awareness and practice regarding breast feeding, artificial feeding and weaning.
- Mothers should be encouraged to promote nutritional status of their children during breast feeding, artificial feeding and weaning process.
- Health education during antenatal care visits about importance of exclusive breastfeeding, principles of artificial feeding and proper weaning practice.

- Early postpartum support programs, to enable mothers to continue breastfeeding for as long as possible.
- Design educational programs for mothers about proper weaning practices, the expected problems and how to handle such problems.

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