

## FACTORS AFFECTING INFANT FEEDING TYPES IN THE SEMI-URBAN REGION IN MOSUL CITY, IRAQ

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### ABSTRACT

**Background:** Breast feeding or nursing is considered the ideal way of feeding of infants, and it provides a lot of benefits for both infants and mothers. The feeding pattern of infants is affected by many factors and differs from one region to another. The aim of our study is to estimate the main influences of infant feeding in semi-urban and rural regions in Mosul City, Iraq. **Methods:** This cross-sectional study was conducted in a semi-urban district near Mosul City, Iraq known as Al-Rasheediya from October 2018 to March 2019. Mothers who had babies between 6 and 12 months old at the time of study and attended the primary health center of the district for vaccination were interviewed using a direct questionnaire that includes many risk factors that affect breast feeding practices and the sample size was 200 which selected randomly. **Results:** In this study, breast feeding was reported among 54.5% of the babies, and less than half of the infants were on mixed feeding or formula feeding alone. The practice of exclusive breast feeding was seen in (15.5%) and the most common reason for the non-exclusive breast feeding was insufficient breast milk (95.6%). Early cessation of breast feeding at 6 months or below was seen in {36.5%} of mothers. High formula feeding rate was seen in mothers with low parity. We also found a significant association of formula feeding with the social support of the mothers. No statistical differences were detected between the mother's age and educational level with the breast feeding pattern. **Conclusion:** Exclusive breast feeding rates in semi-urban and rural regions is low and this raises the need for more health education programs about the importance of breast feeding.

**KEYWORDS:** Exclusive breast feeding, formula feeding, social support, Mosul.

### INTRODUCTION

Breast-feeding is a good source of nutrition for infants; in addition to that, it reduces the risk of specific health conditions for both infants and mothers. The majority of mothers want to breast feed their babies but they stop that early due to a lack of ongoing assistance and support. Many factors play important role in determining breast-feeding and its duration.<sup>[1]</sup>

Reduction or absence of breast feeding is an important public health problem and is associated with increased risk of morbidity and mortality in infants and mothers. Breast feeding leads to a decrease in the incidence of many infectious diseases in infants. Moreover, it reduces the risk of breast and ovarian cancer in mothers. Therefore breast feeding should be the primary method of feeding in the first year of life. It has been

recommended by the American Academy of Pediatrics to feed babies only by breast milk during the first 6 months, and breast feeding encouraged to continue with the addition of other appropriate food, until at least one year of age or longer if the mother and baby wish to.<sup>[2]</sup>

Many mothers wish to breast feed their babies earlier after birth, but some babies may not be able to latch and feed immediately or within the first day after birth, and here we can introduce some help and intervention to encourage the mothers to continue breast feeding until their babies learn with time how to breast feed successfully.<sup>[3]</sup>

Some mothers believe that they have insufficient milk, as their babies always crying and this feeling is enhanced by the social, cultural, and beliefs of their community.<sup>[4]</sup> Furthermore, some midwives, health care professionals,

or private doctors may suggest using supplementation and sometimes the mother themselves decide.<sup>[5]</sup> When a mother gives her baby early supplementation with infant formulas or another supplement; this may lead to a decrease in the frequency of infant feeding and reduction in breast milk supply which eventually causes a fall in the exclusive breast feeding rate in the first six months and shorter duration of breast feeding.<sup>[3]</sup>

Mothers who did not receive feeding advice or support from their families, midwives, or the medical sector were more likely to stop breast-feeding earlier.<sup>[6]</sup>

Therefore before any decision is made by adding supplementation, careful assessment of the baby's condition in regard to the breast feeding position, medical problem or maternal indication should be made by a health care provider.<sup>[7]</sup> And those mothers who had a false perception of inadequate milk usually benefit from assistant, reassurance, and more education about breast feeding and infant normal physiology, need, and behavior to be responsible for their decision in feeding types.<sup>[3]</sup>

The aim of our study is to assess the main factors that influence breast feeding practices in semi-urban and rural regions.

## SUBJECTS AND METHODS

This cross-sectional study was conducted at a primary health care center that is attached to the Al-Rasheediyah District (semi-urban district near Mosul City, Iraq) from October 2018 to March 2019. This health center has a population catchment area of 70,000 and it delivers services to many rural areas attached to it.

Mothers who had babies between 6 and 12 months old and attended the health center for vaccination were interviewed using a direct questionnaire (prepared for this study) over a period of 5 months, and the data were collected randomly until the sample size reached 200.

We choose mothers aged less than 40 years, who had full-term babies, not disabled, singleton birth with a birth weight of 2500 gm and more.

All the enrolled mothers acceded to participate in this study and verbal consent was obtained. The permission to conduct this study was obtained from the ethical committee of the primary health center.

The questionnaire includes many risk factors for poor breast feeding practices which determine the type of infant feeding; and these include maternal socio-demographic data, details on maternal health services, details on breast feeding practices, and the role of social and environmental support. [Table 1]

Descriptive statistics such as frequency and percentages were used to describe the data and the Chi-square test

was used for testing the association between variables understudy with a p-value of 0.05 or less considered as statistical significance.

**Table 1: Factors that affect the breast feeding practice.**

Socio-demographic characteristics
Maternal age in years
Maternal educational status
Maternal socioeconomic level
Maternal parity
Maternal employment status
Maternal health services
Number of prenatal visits
Breast feeding counseling during visits
Place of birth
Mode of delivery
Health care assistance during birth
Social and environmental support
The role of husbands, parents, and neighbors
The role of midwives, private and government doctors

## RESULTS

In this study, most of the mothers were between the ages of 18 and 30 years (68%) and below 18 years old was (6%). About (70.5%) had entered only primary education and (13.5%) were illiterate. The majority of the mothers were multipara (had 4 or more children, 41%), belonged to a low to medium socioeconomic class (92.5%), and (97.5) were housewives. (18%) of the mothers were from nearby rural areas. Table [2]

It was found that 165 (82.5%) of mothers had a normal vaginal delivery (NVD), and 35 (17.5%) of them had a cesarean section. Of those who delivered by NVD, 19% of them delivered at home and (81%) at the governmental hospital.

A total of (51.5%) of the mothers did not go for antenatal check-ups, and about (80.4%) of the attending mothers had not been counseled about the importance of exclusive breast feeding during the visits.

**Table 2: Distribution of the study sample according to the socio-demographic characteristics.**

<i>Socio-demographic profile</i>	<i>Number of mothers in percentage</i>
Maternal age in years	
<18	6.0%
18–25	43.0%
26–30	25.0%
31–40	26.0%
Maternal educational status	
none	13.5%
1ry	70.5%
2ry	10.5%
3ry	5.5%
Maternal socioeconomic level	
Low	22.5%
Medium	70.0%
High	7.5%
Maternal parity	
1	14.5%
2	22.5%
3	22.0%
4 and more	41.0%
Maternal employment status	
yes	2.5%
no	97.5%

Almost all mothers initiated breast feeding in our study (95.5%). However Initiation of breast feeding within the first hour after labor was seen in 34.5% of the mothers. Delay of the first feeding for an hour or more was seen in 57%. A total of 8% of the mothers initiated breast feeding after 24 hours of delivery and their babies were fed with sugar water alone (prelacteal). One mother in this study who had ever breast feed her baby (0.5%).

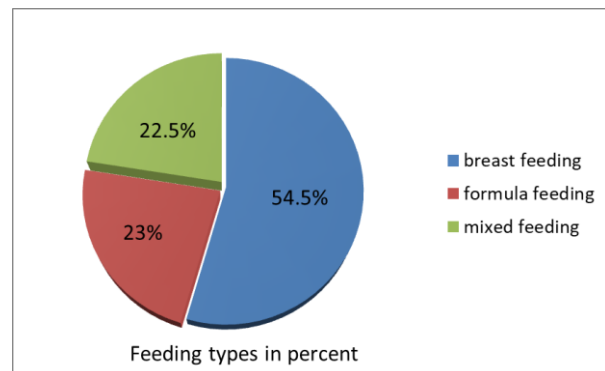
Continuation of breast feeding for more than 6 months of age was seen in (63.5%) of the mothers, whereas breast feeding duration at 6 months of age and below was seen in (36.5%) of infants. Table [3]

**Table 3: Duration of breast feeding.**

<b>Duration of breast feeding in months</b>	<b>No. (N=200)</b>
0–3	34
4–6	39
7–9	96
10–12	31

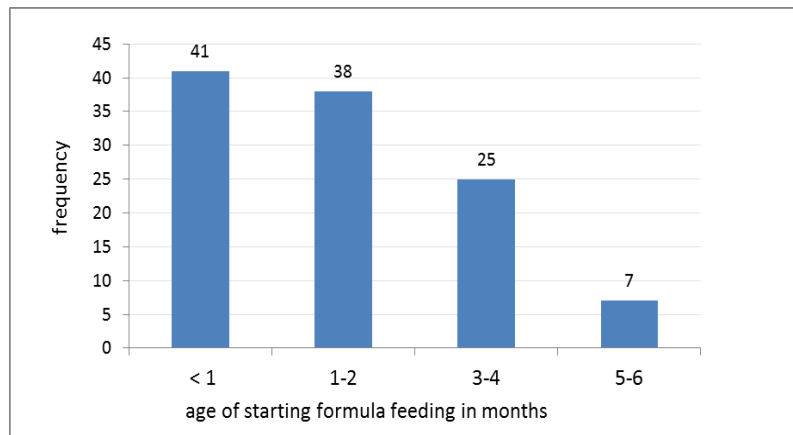
A total of 38.2% of the babies were fed with sugar and water alone for a few days after birth and the most reasons were to pass motion and to eliminate their jaundice.

In the current study, breast feeding was reported among 54.5% of the babies, with mixed feeding and formula feeding reported as (22.5% and 23%) respectively. The exclusive breast feeding rate at 6 months was (15.5%). Figure [1].



**Figure 1: Distribution of feeding types.**

The majority of the mothers who feed their babies by formula alone or together with their breast milk usually started this practice in the early months and the most common reason was insufficient breast milk (95.6%; 87 out of 91). Figure [2]



**Figure 2: Initiation of formula feeding.**

The advice and support to add supplementary formula feeding were received from midwives, private doctors, or government medical staff by (44%) of the mothers and from their relatives and neighbors by (56%) of the mothers.

About (18.3%; Twenty out of 109) of breast feeding mothers had introduced Supplementation with infant formulas to some extent duration for many reasons and thereafter continue with their breast milk alone mainly because of financial inability.

The high formula feeding rate was found to be related to the mother’s low parity ( $p < 0.006$ ) and absence of social support ( $p < 0.0001$ ). Shorter Breast feeding duration below 6 months of age was found high in formula feeding babies ( $p < 0.0001$ ).

No statistical difference was detected among mothers who went to antenatal clinics for check-ups and the types of infant feeding, which may be due to lack of counseling and information about the importance of exclusive breast feeding provided to the mothers during their visits ( $p < 0.81$ ). Table [4]

**Table 4: The main factors influencing formula feeding in relation to other types (mixed feeding and breast feeding).**

Variables	P-value
Mother’s low parity	0.006
Antenatal care visits	0.813
No breast feeding support	0.00001
Mother’s educational level	0.371
Short duration of breast feeding	0.00001

**DISCUSSION**

Breast feeding is the ideal food for the healthy growth and development of infants and for the health of mothers. Optimal breast-feeding is crucial and it could save the lives of over 820,000 children under the age of 5 years each year.<sup>[8]</sup>

World Health Organization (WHO) has recommended early initiation of breast-feeding which should start early and within the first hour after birth.<sup>[9]</sup>

Early initiation of breast-feeding has been found to be the determinant of the exclusive breast feeding success; also it can increase the total breast-feeding duration,<sup>[9,10]</sup> and the colostrum which is the first milk given to the baby contains antibodies that protect the newborn from gaining infections and decrease newborn mortality. The danger of gastrointestinal disease and other infections can increase in infants who are not breast-fed or partially breast-fed.<sup>[10]</sup>

Less than half (42%) of all newborns globally are put to the breast within the first hour after birth.<sup>[11]</sup>

In our study which was conducted in a semi-urban district in Mosul City, almost all mothers had initiated breast feeding (99.5%) which is a good finding, however, 34.5% of mothers breast feed their babies within the first hour after labor, and this percent is approximating to that reported in Baghdad City,2019 which revealed that (32.3%) of the participants starting breast feeding within one hour of delivery,<sup>[12]</sup> and to that reported in Indian rural area 2019 in which (41%) of the mothers initiated breast-feeding within one hour after birth.<sup>[13]</sup>

More than half of the babies in the current study were on breast feeding (54.5%), however, nearly half of the babies reported mixed feeding and formula feeding alone (22.5% and 23%) respectively.

WHO and UNICEF recommend exclusive breast-feeding for the first six months of life and later on with the introduction of safe complementary (solid) foods to the age of two years and more , if possible, the breast feeding for six months is important for both infant and mother. It protects the infant from gastrointestinal infections in both developed and developing countries.<sup>[8]</sup>

The exclusive breast feeding rate at the 6th month of age in our study was 15.5% of babies and it was lower than that reported in Mosul City in 2020 which found that

41% of infants during the first 4–6 months of age were breast-fed exclusively.<sup>[14]</sup>

And much lower than that informed in a rural area of Basrah City in 2021 which found that 57.3% of total babies less than six months of age were exclusively breast-fed.<sup>[15]</sup>

And still lower than that stated by WHO which announced that 44% of infants aged 0–6 months worldwide were exclusively breast-fed over the period of 2015–2020.<sup>[8]</sup>

However, it was near to that found in other countries like Egypt, Jordan, Italy, and the USA, respectively.<sup>[16,17,18,19]</sup>

Breast feeding should be continued to the age of two years or more according to WHO and UNICEF guidelines. The latter found that breast milk is an important source of energy and nutrients to children aged 6–23 months, and it can give half or more of the energy needed to children between the ages of 6 and 12 months, moreover, longer duration of breast-feeding has a positive impact on the health and well-being of the mother and protect them from the risk of ovarian and breast cancer.<sup>[8]</sup>

We observed in this study that babies on formula feeding had a shorter duration of breast feeding than babies on other types of feeding ( $p < 0.0001$ ), this referred to the early introduction of formula feeding in most mothers (86.8% during the first 2 months of age) and cessation of breast feeding within a short time after that.

The most common mother's reasons for those given supplementary formula feeding in this study were inadequate milk (95.6%), and the other causes were child refusal or nipple retraction (4.4%). Another study done in Misan City, Iraq 2016,<sup>[20]</sup> revealed that the most common reasons were due to insufficient milk (48.5%) and the other different reasons were (51.5%), and in Erbil City, Iraq the insufficient milk contributes to (43.5%) of the reasons,<sup>[21]</sup> this difference attributed to cultural belief and traditional attitude which play an important role in the feeding practices in the society.

The feeling of insufficient breast milk is a common problem throughout the world; and as a result of this perception, the mother responds by adding supplements from a very early age and this early supplementation reduces the breast milk supply leading to a shorter duration of breast feeding, and this is often a false perception and the problem could be an incorrect technique of feeding and this can be solved by training the proper technique, giving assurance and emotional support for the mother.<sup>[22]</sup> In our study about (36.5%) of mothers stop breast feeding before 6 months of age which is not a good practice.

Many other factors influence the breast feeding practice, and from those are the social support which includes the role of the (husband, mother, family, and friends) and the role of (health care professionals and midwives). In the current study, we noticed a significant association between social influence and formula feeding among mothers ( $p < 0.0001$ ).

People who are close to the mother play important role in advising, educating, and introducing help to overcome the problems that the mother may face. Mothers in this semi-urban and rural area mainly receive information about exclusive breast feeding from their mothers, neighbors, and friends (56%). Other studies in rural India have also found similar influences of the grandmother and neighbors regarding exclusive breast-feeding.<sup>[23]</sup>

Most of the mothers in this district went to private doctors when they have feeding trouble or complain of inadequate milk and the latter in turn prescribe a formula to the baby and most of them were specialists.

The same result was found in the Philippines in 2011 and in South India when the authors reported a strong association between formula feeding decisions and physicians' recommendations.<sup>[24,25]</sup> Therefore doctors need continuing education about breast feeding problems, physiology of lactation, and an indication of supplementary feeding.

Furthermore, some mothers in our study initiate formula feeding before discharging from hospital after birth in response to medical staff instructions, and this supplementing with formula while babies were still in the hospital was very common,<sup>[26]</sup> and in Italy, it was found that introduction of infant formula in the maternity can be associated with a shorter duration of exclusive breast-feeding.<sup>[27]</sup> However, a mother's decision to initiate and maintain breast-feeding is influenced by emotional support and encouragement from health professionals.<sup>[28]</sup>

Many health care staff lack the important information, attitudes, and skills about breast feeding, therefore WHO and UNICEF recommend training all health care staff and providing them with sufficient knowledge, competence, and skills to support breast-feeding, and it is one of the 10 steps of the Baby-friendly Hospital Initiative.<sup>[29]</sup>

On the other hand, we found that formula feeding among mothers who have one or two babies were more than those who have three or more babies ( $p < 0.006$ ) that is why special measures should be taken to help the new mothers to initiate breast feeding and encourage them to maintain lactation.

Antenatal care in addition to its importance for maternal and fetal well-being, it is the ideal way for counseling pregnant women about the health benefit of early

initiation, exclusive, and prolonged duration of breast-feeding. It can also provide more information about other feeding practices for mothers.<sup>[30]</sup>

Other reports conducted in rural districts in Northwest Ethiopia 2015 declared that antenatal care visits were proved to be related to exclusive breast-feeding practice.<sup>[31]</sup> also in Nigeria 2011 many studies have demonstrated a presumed association between antenatal care and exclusive breast feeding rates.<sup>[32]</sup>

In our study, only half of the mothers went for antenatal visits, however, no statistical difference was detected among mothers with formula feeding and other types of feeding in relation to antenatal clinic visits ( $p < 0.81$ ) and this could be attributed to the lack of counseling about the importance of exclusive breast feeding provided during the visits.

Also, no other significant association in relation to maternal age, educational level, and mode of delivery were detected. And this was inconsistent with other studies done in Baghdad and Basrah cities, Iraq that revealed a significant association between maternal age and educational level with the rate of exclusive breast-feeding.<sup>[12,15]</sup>

## CONCLUSIONS

We found that formula feeding practice was common among women in semi-urban and rural areas with a decline in exclusive breast feeding rate and this may be attributed to many factors like social influence, cultural beliefs, and personal experience, so a health education intervention must be implemented in rural and semi-urban districts to educate the public about the benefit of breast feeding and the hazard of not breast feeding, and great attention should be paid to all pregnant mothers about the importance of exclusive breast feeding during the antenatal and postnatal care visits.

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