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FACTORS AFFECTING INITIATION AND EXCLUSIVITY OF BREASTFEEDING IN QATIF, SAUDI ARABIA

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ABSTRACT

Objective: To define the possible factors that affect initiation and exclusivity of breastfeeding - recommended by WHO - in primary health care attendees in Qatif area, Saudi Arabia and to determine factors affecting the decision to breastfeed. **Setting:** The study was conducted specifically in eight Primary Care centres at Qatif / Saudi Arabia. **Method:** Cross-sectional analytic study with multistage sampling technique; eight primary care centres were selected and 400 subjects were randomly enrolled in the study. Data was collected using a validated questionnaire for interviewing the subjects. It started from November 2011 to January 2012. Analysis was done using SPSS version 16. Logistic regression analysis was used to determine the independent variables that affect initiation and decision of breastfeeding. **Results:** About 40% of study population was using mixed type of feeding and the reasons of adding bottle-feeding were "insufficient breast milk" (36.9%) and "return to work" (26.3%). Initiation of breastfeeding within one hour after delivery was reported in 33.5% of the study population. Only 9.5% practiced exclusive breastfeeding at six months of age. Complementary feeding was started in more than half of infants less than six months of age. Initiation of breastfeeding was significantly affected by mode of delivery, parity, infant health status and receiving help for breastfeeding by medical staff. Exclusivity was found to be negatively associated with use of pacifier, return to work and choosing mixed type of feeding. **Conclusion:** Two thirds of study population have chosen breastfeeding and about one third of study population initiated breastfeeding within the first hour after delivery. A small proportion of mothers practiced exclusive breastfeeding at six months of age. Assisted delivery, parity and other factors were found to be significantly associated to initiation of breastfeeding with varying degrees. Many factors were found to affect the decision to breastfeed. It is recommended that polices of the BFHI should be strictly followed. This means hospital and PHC staff need to be re- trained and/ or updated. The investigator recommends intensive health education program for promoting breastfeeding at PHC centres. Special attention need to be given to high – risk mothers to encourage early initiation and exclusive breastfeeding.

INTRODUCTION

Breastfeeding is one of the most valuable rights given to the infants and it is natural way of providing young infants with the nutrients they need for healthy growth and development. The World health organization (WHO) global recommendation was that infants be exclusively breastfed for between four and six months before introduction of complementary foods. However, after the 2001 Expert Consultation and the 2002 publication of a WHO-commissioned systematic review, the global recommendation was modified and exclusive breastfeeding is now recommended for the first six months of life with the introduction of complementary foods thereafter and continued breastfeeding for the first two years[1-3].

The benefits of breastfeeding for infant, mother, family, and community are well recognized. Various studies show that breastfeeding decreases overall child morbidity and mortality such as gastrointestinal and respiratory infection, obesity, diabetes, atherosclerosis, cardiovascular disease [4-6] and mental illnesses in childhood and adulthood[7]. In other arm it decease overall maternal morbidity and mortality as studies show that it decrease risk of breast cancer, ovarian cancer, endometrial cancer and metabolic syndrome [8-10]. As it is known that these

morbidities become now major health problems worldwide. So, why not to control them by this natural way of feeding?

Literature review shows that the breast-feeding practices declined over the last few years early introduction of formula milk and solid food has increased worldwide[11,12]. In Saudi Arabia the current practice of infants, feeding is far from compliance to WHO recommendations despite high level of health education. In 2003 statistics review on breastfeeding in Saudi Arabia by Aljassir shows that majority of mothers start breastfeeding their infants but soon introduce bottles. The duration of breastfeeding varies but in general it is beyond six months and the most common reason for the early introduction of bottle-feeding is insufficient breast milk[13]. Although Muslim and Holy Quran recommend and emphasized on breastfeeding that the mother should breastfeed her offspring for two years, Saudi Arabia has low prevalence in exclusive breastfeeding in comparison to other country. Therefore, what are the obstacles facing mothers not to initiate and continue breastfeeding. Reasons found in western area of Saudi Arabia for switching to formula feeding was inadequate milk supply (50%), working mothers (12.7%) and life style (10%). breast feeding mothers were significantly more satisfied with their feeding practice than those mother who bottle fed their infants[14]. According to El Mousan study 2005 that the result indicates a drop from 88.6% at birth to 1.8% at twelve months[15]. In another study additional reasons included as sickness of the mother or needed to take medicine 71.8%, a health professional asked mother not to breastfeed for medical reasons in 61.1% and the use of contraception that interferes with milk supply (32.8%)[14].

In Saudi Arabia over last ten year, a nationwide program "Baby Friendly Hospital Initiative (BFHI)" was started by the Ministry of Health (MOH) focus on breast feeding initiation after delivery and its exclusivity as one of important area to be served well. It provide a training program for the staff of maternity units in hospitals including hospital private sector. This program was not evaluate to determine its effectiveness and needs for improvement.

This study will be conducted in primary health care centres at Qatif city in Saudi Arabia where an education program breastfeeding was practiced with a good continuity of care this the study findings will improve breastfeeding practices by planning a more effective intervention(s) and it may fill the gaps in breastfeeding education to be more mother centred education.

This aims of this study is to identify possible factors that affect initiation and exclusivity breastfeeding up to six months as recommended by WHO in primary health care attendees in Qatif area, Saudi Arabia. The findings of this study will improve breastfeeding practices by planning a more effective intervention(s) and it may fill the gaps in breastfeeding education to be more mother centred education.

METHODOLOGY

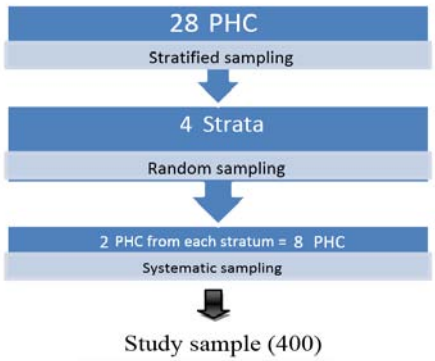
Setting

The study was conducted in Primary Health Care (PHC) centres in Qatif area. Qatif is a governorate and urban area located in Eastern Province, Saudi Arabia and lies in the north-east of the Kingdom of Saudi Arabia and it is 20 km north to Dammam the capital of the eastern province. It has a population of 300,000. There are 28 PHC centres in Qatif, among the total of children registered in well baby clinics at 6month of age is 2874 children. PHC centres clinics were chosen, as this is the place where the continuity of care takes place and breastfeeding problems can be early detected and managed.

Sample

The sample of was done by Multistage sampling technique, started with stratified sampling of the PHC centres in Qatif area depending on geographic location (north , east, west and south). Then, two PHC centres from each stratum were selected by simple random sampling and eight PHC were chosen. After that systematic sampling to mothers attended well baby clinic in each PHC starting form November 2011 to January 2012. (Figure 1)

Figure 1. Illustration of Sampling Technique



The effective sample size was calculated based on 5% significance level and 95% power level. A minimum sample of 400 mothers attended well baby clinic in each PHC centres is required. Total of 400 participants have been included in the study.

Mothers attended the well baby clinic in primary health care centres with their infant between 2 months – 3 years of age as this the targeted age group to asses breastfeeding Age up to three years was determined to minimize recall bias. Attending mothers with a sick child were excluded for the study.

Questionnaire and study design

The data collection tool was a validated interviewer- conducted questionnaire by 15-trained nurses. The questions in the questionnaire were built after literature review, converting the objective in to variable, and the variables in to questions. The main variables in the questionnaire were: mother's age, infant's age, parity, mother's education level, employment status, mother's health status, infant health status, infant maturity, type of feeding , time of initiation and duration of breastfeeding ,breastfeeding decision time, factors related to breastfeeding decision, factor related to adding formula milk to breastfeeding, age at which complementary feeding started and any additives during the first six months of age e.g.(water, infant' tea, juices,etc).

Data analysis

Interviewed nurse informed the participants about the purpose of the study and that their participation is voluntary. The data was collected over a period of three months. Data was checked for accuracy and completeness, was entered, and coded using SPSS version 16. All variables were presented as number with percentage. Associations between factors were analyzed by Chi-square test for univariate analysis, and by multiple logistic regression for multivariate analysis. Results were presented as adjusted

odds ratio (OR) with 95%confidence interval (CI). P-value < 0.05 was considered statistically significant.

Ethical approval

An official ethical approval permitting data collection from physicians was sought and granted from Approval was obtained from Central Supervisory Committee for Training in Family Medicine. Also, approval from primary health care director in Qatif area was given. This survey was anonymous, and participation was voluntary and a verbal consent was taken from the mothers before the interview.

RESULTS

A total of 400 participants were interviewed, More than half (53.5%) of the study population were aged between 25 – 34 years. The parity of study sample is almost the same; mothers having one child, two children and four or more represent similar number and fewer mothers having three children. The main bulk of study population had secondary education (49.5%) then university (39.2%) and small number were primary and intermediate level (11.2%). Around three quarters (74.2%) of study population were housewives and one quarter was employed (20%) and student (5.8%). Almost half of the infants (46%) aged between one to six months and the mean age of infants in the study was 9.95 months. The history of smoking among nursing mothers in Qatif area is found to be (5.2%). (Table 1)

Table 1. Socio-Demographic Characteristics of Study Population (N=400)

Background \ characteristic	Number	Percentage (%)
Age of the mother (years)		
15-24	76	19
25-34	214	53.5
> 35	110	27.5
Parity		
Primiparous	109	27.2
2	105	26.2
3	77	19.2
4	109	27.2
Education level		
Primary & intermediate	45	11.2
Secondary	198	49.5
University	157	39.2
Employment		
House wife	297	74.2
Employed	80	20
Student	23	5.8
Age of the child (months)		
1-6	184	46
7-18	157	39.2
19-36	59	14.8
Smoking history		
Smoker	21	5.2
Not smoker	379	94.8

Table 2 shows the characteristics of mothers, infants and infant feeding methods of study population; mode of delivery, mother health status, infant health status, infant maturity, type of feeding, Initiation time, age at which complementary feeding started and additives in the first six months of age. Most of the mothers in study delivered by spontaneous vaginal delivery (83.8%) and fewer mothers had assisted delivery (mothers who delivered by vacuum or caesarean section) (16.2%). Most of them were healthy (90%); sickle cell disease in 6%, 2% with hypertension, 0.5% diabetes and 0.2% with depression. Almost all the infants were healthy (94%) and only 6% were unhealthy; 1% down syndrome, 1.2% had congenital heart disease and fewer infants had jaundice, respiratory illnesses and allergic diseases. Term infants represent most of the infant (95%) in the study and preterm infants represent 5%. Nearly two thirds (60%) of mothers in study population were chosen breastfeeding as a method to feed their infants and the rest have chosen mixed type of feeding. About one third (33.5 %) of mothers initiated breastfeeding within the first hour after delivery. More than half of infants (54.5%) did not reach six months of age when complementary feeding was started. Most of the mothers (90.5%) in study added water and \ or infant tea, juice, dates, etc in the first six months of life before completing sixth month. Only 9.5% practiced exclusive breastfeeding at six months of age.

Table 2. Mothers, Infants and Feeding Characteristic of Study Sample (N=400)

Characteristic	Number	Percentage (%)
Mode of delivery		
Vaginal	335	83.8
Assessed delivery	65	16.2
Mother health status		
Healthy	360	90
Unhealthy	40	10
infant health status 10		
Healthy	376	94
Unhealthy	24	6
Maturity of the infant		
Preterm	20	5
Term	380	95
Type of feeding		
Breastfeeding	240	60
Mixed feeding	160	40
Initiation time		
Within 1 hour after delivery	134	33.5
>1hour	266	66.5
Age at which complementary feeding started		
<6 months	218	54.5
≥ 6 months	182	45.5
Additives e.g.(water, infant tea ,etc) **in the first 6 months**		
Used	362	90.5
Not used	38	9.5

Table 3 shows the relation of initiation of breast-feeding by significant socio-demographic and other factors; mode of delivery, parity, infant health status and other significant factors; receiving help for breastfeeding after delivery, bottle milk gifts and husband support.

Among women who had normal vaginal delivery the initiation within1 hour is more than double (37.3%) the women who delivered by assisted delivery (13.8%). This is statistically significant (P value <0.001). There were fewer primiparous mothers who initiated breast-feeding within one hour after delivery compared to multiparous

mothers who were found to be statistically significant (P value 0.035). About more than one third of mother with healthy infants (34.8%) initiated breast feeding within first one hour after delivery and only 12.5% of mothers with unhealthy infants initiated early (P value 0.023). Mothers receiving help to breastfed their infant immediately after delivery by doctors or medical staff have higher percentage (52.9%) of initiation compared to those receiving help from their relatives (20%) or received no help (28.1%). This is statistically significant (P= 0.008). About three quarters (72.4%) of mother who received bottle milk as a gift during hospital stay delayed initiation to more than one hour (P= 0.048). About one third (32.6%) of mothers with supported by their husbands and almost the same percentage (33.8%)in mother with unsupported husbands initiate breastfeeding within one hour of infants live this is not statistically significant. Other factors were investigated in this study; mothers' age, employment, hospital type and infant maturity did not show significant association with initiation of breastfeeding.

Table 3. Time of Initiation of Breast feeding by Selected Socio-Demographic and Other Factors (N=400)

Factors	Initiation Time		P value
	≤ 1 hour No. (%)	> 1 hour No. (%)	
Mode of delivery			
Vaginal	125 (37.3)	210 (62.7)	<0.001
Assessed delivery	9 (13.8)	56 (86.2)	
Parity			
Primiparous	30 (27.5)	79 (72.5)	0.035
2	47 (44.8)	58 (55.2)	
3	25 (32.5)	52 (67.5)	
4	32 (29.4)	77 (70.6)	
infant health status			
Healthy	131 (34.8)	254 (65.2)	0.025
Unhealthy	3 (12.5)	21 (87.5)	
Bottle Milk Gift at Hospital stay			
Given	97 (36.5)	197 (63.5)	0.048
Husband Supporting			
Support provided	31 (32.6)	64 (67.4)	0.901
Support not provided	103 (33.8)	202 (66.5)	

Results presented in table 4 show the relation of duration of breastfeeding in mothers who stopped breastfeeding during the study by factors such as ;type of feeding , pacifier use , insufficient milk , return to work and mother satisfaction. Not all mothers who chose breast-feeding as a method to feed their infant stopped breast-feeding before their infant reached six months. This is statistically significant (P <0.001). Mothers not using pacifier for their infants were more (15.9%) to be exclusive breastfed their infants than those using pacifier (5.8%) and this is statistically significant (P=0.001). Mothers return to work are less likely to have exclusively breastfeeding and stop breastfeeding before six months this is statistically significant (P < 0.001). more mothers who fed their babies for six months or more were satisfied compared to mothers who breastfeed less than six months and this was found to be significant (P<0.001).

Table 4. Duration of Breastfeeding (Exclusivity of Breastfeeding) by Some Factors (N= 400)

Factors	Mother still breast-feeding their child		Mother still breast-feeding their child	P value
	< 6 months No. (%)	≥ 6 months No. (%)		
Type of feeding				
Breast-feeding	0 (0)	32 (13.3)	208 (86.7)	< 0.001
Mixed feeding	20 (12.5)	56 (86.2)	117 (73.1)	
Pacifier user				
Used	10 (11.6)	5 (5.8)	71 (82.6)	0.001
Not used	10 (3.2)	50 (15.9)	254 (80.9)	
Return to work				
Return	8 (19)	3 (7.1)	31 (73.8)	< 0.001
Mother satisfaction				
Present	10 (2.8)	51 (14.4)	293 (82.8)	< 0.001

Table 5 shows the association between type of feeding and factors affecting decision on type of feeding Include**;** employment, mode of delivery, parity, breastfeeding decision time and pacifier user. Employed and student mothers who decided to breastfeed represented only 16.7% of all mothers; the rest 83.3% were housewives. The difference was statistically significant at P value < 0.001. Mothers who had normal vaginal delivery who decided to breastfeed represented about two thirds of all mothers (63%). The difference between this group of mothers and those who received assistance with delivery was statistically significant at P value =0.008. Nearly three quarters (73.4%) of the multiparas mothers (four child or more) who chose breastfeeding method to feed their infants compared to mothers with less parity the difference is statistically significant (P =0.008). Nearly two third of the mothers (60.5%) who used pacifiers tended to choose the mixed type of feeding and the opposite is true among mothers not using pacifier (65.6%), they preferred to breastfeed their babies. The difference was statistically significant at P < 0.001. More mothers who made the decision to breastfeed before they got pregnant (64.6%) actually breastfeed their babies compared to mothers who took the decision during and after they got pregnant (55.1% - 46.2%). This result found to be statistically significant at P value= 0.04. About two thirds (64.7%) of the mothers were satisfied about their feeding method and when they were chosen breastfeeding.

Table 5. The Association between Type of Feeding and Selected Factors (N= 400)

Factors	Type of Feeding		P value
	Breast-feeding No. (%)	Mixed feeding No. (%)	
Mode of delivery			
House wife	200 (83.3)	97 (60.6)	< 0.001
Employed	30 (12.5)	50 (31.2)	
Student	10 (4.2)	13 (8.1)	
Mode of delivery			

Vaginal	211 (63)	124 (37)	0.008
Assisted delivery	29 (44.6)	36 (55.4)	
Parity			
Primiparous	58 (53.2)	51 (46.8)	0.008
2	57 (54.3)	48 (45.7)	
3	45 (58.4)	32 (41)	
4	80 (73.4)	29 (26.6)	
Pacifier use			
Used	34 (39.5)	52 (60.5)	< 0.001
Not used	206 (65.6)	108 (34.4)	
Decision time to breastfeed			
Before pregnancy	157 (64.6)	86 (35.4)	0.04
During pregnancy	65 (55.1)	53 (44.9)	
After delivery	18 (46.2)	21 (53.8)	
Mother satisfaction with feeding method			
Satisfied	229 (64.7)	25 (35.3)	< 0.001

Table 6 shows the factors associated with introducing of formula feeding with breastfeeding. Of the 160 mothers who added formula milk to breastfeeding made that decision because of several reasons; of these "Insufficient breast milk" was of the highest proportion (36.9%) and the second reason is "returning to work" (26.3%). Thirty – seven mothers (23.1%) added bottle-feeding "when the mother was outside the home". "house work" were a reason in 27 (16.9%) of the mothers. Infant refusal was a reason in 16 (10%) of the mothers who added bottle-feeding to the breast-feeding. "Nipple related problems" and "to train infant on bottle feeding" was cause in 14(8.8%) of the mothers. A small number of mothers (6\160) who added bottle feeding to the breast-feeding is due to "previous negative breast-feeding experience" , "illness of the mother" and "during night time" to let the baby sleep and not to disturbs the mother sleep. Three mothers added bottle-feeding because their "husband refused breast-feeding when the mother outside home"; in malls and at the car. Two mothers had "no desire to breastfeed their infant" and one mother because she want to "use Oral Contraceptive Pill" therefore they added bottle-feeding.

Table 6. Reasons Associated with Adding Bottle Feeding to Breast-feeding (N= 400)

Reason	Number	Percentage (%)
Insufficient breast milk	59	36.9
Return to work	42	26.3
When the mother is outside home	37	23.1
House work	27	16.9
Infant refusal	16	10
To train infant on bottle feeding	14	8.8
Nipple problem	14	8.8

Table 7 shows the Logistic regression analysis of significant factors associated with initiation of breast-feeding within one hour after delivery. Factors found to be significantly associated with initiation of breast-feeding within one hour after delivery were mode of delivery, infant health and receiving help after delivery. Mothers who had normal vaginal delivery were four times more likely to initiate of breast-feeding within one hour after delivery compared to those who had assisted delivery (OR = 4.025; 95% C. I. 2.241 – 7.230; p-value < 0.001). Mothers who had healthy infants were 2.5 times more likely to initiate of breast-feeding within one hour after delivery compared to those who had unhealthy infants (OR = 2.502; 95% C. I. 1.032 – 6.066; p-value = 0.042). Mothers who received help to breastfeed after delivery by doctors or medical staff were 1.4 times more likely to initiate of breast-feeding within one hour after delivery compared to those who received help from their relatives or did not receive help at all (OR = 1.371; 95% C.I. 1.013 – 1.855; p-value = 0.041).

Table 7. Logistic Regression Analysis of Significant Factors Associated with Initiation of breastfeeding within one hour after Delivery

Variables	ß coefficient	S.E. of ß	P value	Odds Ratio (OR)	95% confidence interval
Mode of delivery	1.392	0.299	< 0.001	36.9	2.241-7.230
Infant health	0.917	0.452	0.042	26.3	1.032-6.066
Receiving help after delivery	0316	0.154	0.041	23.1	1.013-1.855

Table 8. Logistic Regression Analysis of significant Factors Associated with Decision to Breastfeed

Variables	ß coefficient	S.E. of ß	P value	Odds Ratio (OR)	95% confidence interval
Employment	1.014	0.211	< 0.001	2.755	1.822-4.168
Use of pacifier	-0.965	0.310	0.002	0.381	0.207-0.700
Mother satisfaction with breast feeding	1.214	0.451	0.007	3.368	1.391-8.156
Time of breastfeeding decision	0.385	0.187	0.039	1.469	1.019-2.119

Table 8 showed the Logistic regression analysis of significant factors affecting decision of breastfeed. It was found that housewives were 2.8 times more likely to breastfeed their babies for≥ 6 months (exclusive breast - feeding) compared to employed and student mothers (OR = 2.755; 95% C. I. 1.822 – 4.168; p-value <0.001). Using pacifiers significantly decreased the probability of breastfeeding (OR = 0.381; 95% C.I. 0.207 – 0.700; p-value = 0.002). Mothers who breastfed their infants≥ for 6 months (exclusive breast-feeding) were 3.4 times likely to be satisfied about their infant feeding (OR = 3.368; 95% C. I. 1.391 – 8.156; p-value = 0.007). Mothers who took the breastfeeding decision before pregnancy were 1.5 times practiced breast-feeding for ≥ 6 months (OR = 1.469; 95% C. I. 1.019 – 2.119; p-value = 0.039).

DISCUSSION

Socio-demographic Factors of Study Population

The recognition of the impact of breastfeeding on the child survival and prevention of morbidities has lead researchers to study breastfeeding rates, obstacles and the relation of these to initiation and exclusivity of breastfeeding. In the current study, some of the socio-demographic characteristic were similar to other studies in Saudi Arabia like mother age, parity, education level, employment status of the mothers and infant age[13,15]. It was found that the preterm infants represent 5% in the study population, which is lower than the rate of a study in Jazan (8.24%). This may be due to different factors such as different standards of care during antenatal period or the difference in mothers' health status[16]. Most of participants breastfed their infants (60%) and less than half (40%) used mixed type of feeding**.** In a random cross-sectional study between 2000-2001 in Al Kharj, KSA mixed breastfeeding was the most common feeding method in 66.1% reported by Ogbeide et al. The results shows lower rate (40%) as compared to their report[17]. One-third (33.5 %) of the study population initiated breastfeeding within the first hour after delivery although the definition of initiation of breast-feeding varies widely between studies. It's found that initiation of breast feeding is a strong predictor of exclusive breastfeeding at four months of age[18]. El Mouzan et al reported that the initiation of breast-feeding was 23.2% in the first hours after birth[15] in KSA in 2009. The difference in these proportions may be due to improvement of educational program on Breast feeding and increasing of BFHI activities. Only 9.5% practiced exclusive breastfeeding at six months of age in study population and the rest they were adding water and \ or infant tea, juice, dates ,etc. In the first six months of infants life. The proportion of mothers who practiced exclusive breast-feeding is much lower than the WHO target of 17% at six months[19]. Smoking rate in the study sample was 5.2% which is consistent with recent study (2009) by Bassiony MM as the prevalent range of smoking among females in Saudi Arabia is 1-16% (median = 9%)[20].

Initiation of Breastfeeding

Among women who had normal vaginal delivery in the sample the initiation of breast-feeding, within one hour after delivery was (37.3%). This was more than double in comparison to women delivered by assisted delivery (13.8%) this is an expected result as mother delivered vaginally will not be tired and would initiate breast feeding earlier than those who had assisted delivery .This result is not consistent with literature. Meta- analysis has shown a negative association between caesarean delivery and early breastfeeding[21]. This could be due to maternal characteristics post assisted delivery or physiological factors in mother consequent upon mode of delivery. Fewer primiparous women initiated breast-feeding within one hour after delivery compared to multiparous mothers. This result is expected as primigravidas may lack of knowledge or have no experience in breastfeeding and therefore delay the initiation of breast-feeding and consistent with literature. The risk of not initiating breast-feeding early decreased with increasing parity in a survey that included 7142 Dominican women in the US (1997)[22]. This means that parity is positively associated with initiation of breastfeeding.

Mothers with healthy infants (34.8%) initiated breast-feeding earlier than those with unhealthy infants (12.5%). This difference is expected as unhealthy infants may have special circumstances to be separated from the mother due to requirement of special care.

Some of the unhealthy infants who are included in the study had Down's syndrome (1%) and congenital heart disease (CHD) (1.2 %). Almost the same result was reported in the literature as it was observed that Saudi mothers with Down's syndrome children frequently breastfed their children and introduced solid food comparatively late[23]. Winikoff et al. have reported a greater risk of failure to initiate breast-feeding among mothers whose children experienced problems in the immediate perinatal period (2002)[24]. The relation of down's syndrome and breastfeeding in Saudi Arabia was not different from the population and also the other study of the relation between the congenital heart disease (CHD) and breastfeeding in Mexico (2002)[25]. It appears that mothers of unhealthy infants are more likely to delay initiation of breastfeeding.

Mothers receiving help to breastfeed their infant immediately after delivery by doctors or medical staff (52.9%) were more likely to initiate breast-feeding compared to those who received help from relatives or not receiving help. This is expected as the doctors and medical staff are likely to be more expert, aware of the evidence and more skilful in giving advice and managing problems that the mother could face. This result is consistent with a previous study in Mexico, which found that if the care provided by doctors the initiation is greater than if provided by the nurse[25]. In another study in Nigeria (2006) it was found that, there was a low prevalence of early initiation of breastfeeding due to delay in helping the newly delivered mothers[26]. The investigator found that a bottle milk gift at hospital independently delayed initiation of breast-feeding in 72% of mothers who received bottle milk gift. This is a negative result because once the mothers were given bottle milk gift there will have more chance to delay initiation of breast-feeding .There is controversy in the literature review about hospital discharge pack . A meta- analysis of nine randomized controlled trials involving 3,730 women found that exclusivity of breastfeeding was reduced when commercially prepared hospital discharge packs (with or without formula) were distributed [27] . Two U.S. studies suggested that there is no great concern about discharge packs, regardless of their contents, relative to other known influences on breastfeeding initiation and duration[28].

Husband support in this study appeared to be not affecting early initiation of breastfeeding. This is expected. In western cultures where there is no extended family, the presence of husband is crucial and according to literature, it makes a difference about early initiation[29]. In Kuwait and gulf countries, the phenomenon of nuclear family is on the increase and this is the reason of positive association of husband support with early initiation as reported[30]. The investigator expects this current situation would change over time in the near future. Other factors in this study included; mother's age, employment, hospital type and infant maturity. They did not show significant association with initiation of breastfeeding. This can be explained that experienced mothers may practice and / or repeat of previous breast-feeding practice with no changes would be done as they become older.

Work of mother appeared not to affect initiation of breast-feeding and this is expected as the mothers were in

hospital at initiation time. Maturity of the infant was found to have no association with initiation of breastfeeding. This may be because the mother is usually available at the hospital and she could initiate breastfeeding.

Exclusivity of Breastfeeding

All mothers who decided to breast-feeding as a method of feeding their infant did not stop breast-feeding before their infant reached six months. This is a positive result because once she decided to breastfeed most probably the mother would continue breast-feeding for more than six months. In the literature, it was mentioned that mothers are more likely to breastfeed if they have a positive attitude toward breastfeeding but they did not report that the maternal choice of feeding method might affect duration of breastfeeding[31].

Using pacifiers appear to affect exclusivity of breast-feeding in 5.8% of study population. This is an expected result as pacifier can cause decrease the infant–mother contact. This is consistent with literature. In 1993 a study showed that early weaning was higher in pacifier users than in non-users[32]. So pacifier uses significantly reduce duration of breastfeeding. Mothers who return to work are more likely not to have exclusive breast-feeding and stop breast-feeding before six months. This result is consistent with recent literature as it was found that return to work was associated with decrease duration of breastfeeding [33]. Return to work is a significant factor that affects exclusivity of breastfeeding.

Mother's Satisfaction with breast-feeding was found to be associated with duration of breastfeeding. Mothers who fed their babies for six months or more were more satisfied compared to mothers who breastfeed less than six months. This is expected, because mothers are usually satisfied more if they breastfeed their infants and some of them may feel guilty if they add formula milk .Similar result were reported in Jeddah[13]. Similarity of the study population in this study and Jeddah study may have contributed to similarity of results.

Decision to Breastfeed

The fact that more housewives have chosen to breastfeed was expected. Supposedly, they have more time with their children. This is consistent with a study by Al Murshid in the five regions of Saudi Arabia. She included 912 mothers and found that exclusive breastfeeding was more in housewives compared with employed wives. She reported more mixed feeding method among the employed wives[34].

Mothers who had normal vaginal delivery who decided to breastfeed represent about two thirds of all mothers (63%). This result is expected because mothers who had normal vaginal delivery usually initiate breast-feeding earlier as they will be in close contact with their babies more frequently in the first days after delivery. This would increase stimulation of milk production and therefore are more likely to have enough milk and therefore less likely to add formula milk.

In the literature it was revealed that some researchers have found no association between mode of delivery and breastfeeding[35], but others have reported a negative association between caesarean delivery and breastfeeding initiation[36]. Our result seems to be similar to some researcher studies and differ from others. This may be due to different socio – demographic characteristic, different hospital policies and other confounders. Nearly three quarters (73.4%) of the multiparous mothers who chose breastfeeding method to feed their infants compared to mothers with less parity and this is an expected result as multiparous mothers usually have more experience in feeding techniques and they might have noticed the breastfeeding benefits their previous child. Two studies in Saudi Arabia reported an increase in breast-feeding with parity[13,34]. A review article published in 2002 showed that shows increasing parity was positively associated with an increase in initiation and continuation of breastfeeding[37]. The results of these studies are consistent with our results as or study population share the same characteristics. It can be conclude that parity is a significant factor affecting feeding decision positively.

It was found that more than half (60.5%) the mothers who used pacifiers tended to choose the mixed type of feeding. This is expected as the use of pacifiers will reduce contact with the mother and reduce crying of the hungry infant and this decreases milk production. This lead the mother to add formula milk. A systematic review done in 2009 showed that the highest level of evidence does not support an adverse relationship between pacifier use and breastfeeding duration or exclusivity[38]. Such a negative association in our study is due to complex factors, such as breast-feeding difficulties or weaning time. However, another study in Brazil reported a higher risk that a child would be weaned at any age between 1 and 24 months in pacifier users than in nonuser[39].

Most mothers in the study population decided to breast-feeding and about two thirds of them actually breastfed their babies and this is a good result. Other studies showed similar result; the earlier the decision to breastfeed the greater is the likelihood of early initiation and longer duration of breast-feeding[40]. This factor seems to be not affected by socio – demographic characteristic and that may explain similarity of the result.

Factor associated with adding bottle feeding to breastfeeding

"Insufficient breast milk" represents more than one third of study population (table 5) who added bottle feeding to breastfeeding and this may be due to applying breast feeding *Schedule* as it decided by the nurse and this lead to non-biological feeding (feeding by hours, *Schedule*d feeding) therefore insufficient milk due to lack of rooming – in could affect successful initiation of breast-feeding. This is usually the case in hospital were the BFHI concept and practice is not applied. Insufficient milk supply syndrome is a complex phenomenon and a major reason reported by mothers worldwide for early termination of breastfeeding[41].

A sizable minority of the mothers (26.3%) who added bottle feeding to the breast-feeding because of" returning to work" after maternity leave and that they lack knowledge about the method of preserving breast milk after suction of lack of interest on suction of breast milk and another possible reason is lack of *crèche*s at work place. Research showed that if work requirements of≥32 hr/week it reduced Breast-feeding by 3.1% compared to non-workers[42].

More than one fifth of the mothers who added bottle-feeding to the breast-feeding gave a reason that "when they are outside home". This is a negative result as this should not be a reason to add bottle-feeding to the breast-feeding. This is probably due to the culture that is not in favour mothers to breast-feeding in public place or in

front of other people. This reason was not studied in the literature.

The results of study population showed that "house work" was a cause of adding bottle-feeding to the breastfeeding in 16.9%. This may be because the mother depending on housemaid in ever thing therefore she is easily give their baby to their house maid to spends her time by what she likes. This study showed that infant refusal is a cause of adding bottle-feeding in 10%. In the literature, it is found that infant refusal represents 13.1% in a study done in Bangkok (2007)[39].Fortunately the number of mothers who added the bottle because they wanted "to train the infant on bottle feeding" is small (14\160). However, this concept of training the baby on bottle is wrong concept because when the child is weaned it should be fed by cup and spoon.

The fact that some mothers added bottle because they had nipple problems should not be a reason. Any nipple problems should be managed during Antenatal care and if they occur after delivery (sore nipple, cracked nipple, breast congestion and abscess) should be managed promptly so that full breast-feeding will not be affected. A small number of mothers(6\160) added bottle during night although study showed a significant relationship between the period of breastfeeding and night feeding implying that night feeding increases the period of breast-feeding [43] so giving the babies bottle feeding during night is wrong behaviour from the mothers side. About the same number of mothers they added bottle feeding because of" negative experience with breast-feeding "and "ill mother". Probably these mothers not adequately educated on breastfeeding and there are few condition of the mother could be considered absolute contraindication (active tuberculosis, use of cytotoxic drugs, puerperal psychosis. Two mothers added bottle-feeding because they did not have a desire to breastfeed it could be the main reason for insufficient milk syndrome. One mother added the bottle-feeding because she used oral contraceptive pills. This is a surprising finding as the investigator would expect more mothers to stop breast-feeding due to the use of wrong contraception, which cause drying of the breast. Worldwide this is main reason of failure of lactation[43].

From all the factors discussed in table 2, the logistic regression of this table 6 shows the most important factors affecting initiation of breast-feeding. Therefore, emphasis and priority in breast-feeding education should be put on these three factors. Out of the six factors presented in table 3, four factors showed in table 7 to be most significant factors by logistic regression. The implication of these four factors and other factors were discussed previously. However, since logistic regression showed that these the most important factors, health professionals should interfere to encourage mothers to take the decision on breast-feeding earlier; preferable before pregnancy.

The three major hospitals in the eastern province of Saudi Arabia applying rooming – in and feeding on demand as one of major police for successful breast-feeding. However, the effect of this is not apparent and the results related to initiation and exclusivity of breastfeeding in the studied area indicate clearly that there is ineffective implementation of polices.

Conclusion and Recommendations

More than half of study population chosen breastfeeding and about one third of study population initiated breastfeeding within the first hour after delivery. Only 9.5% practiced exclusive breastfeeding at months of age. Complementary feeding was started in more than half of infants less than six months of age.

Mothers delivered by normal vaginal delivery initiated breast-feeding earlier than those had assisted delivery. This will implicate that mothers who had assisted delivery may start formula milk or may have insufficient milk later and increase the chance of delayed mobilization of postpartum women with its complications. It is therefore recommended that during primary health care antenatal visits nurses should educate pregnant ladies to have normal vaginal delivery assisted by video and special exercises and if for some reasons she had assisted delivery to educate them for the importance of early breast-feeding initiation. Trial of labor should be exhausted and labor should not be hurried. This will probably be possible if there is a clear hospital policy that should strictly be followed by all staff. Initiation of breastfeeding increase with parity and this implicate that the first child in the family will be prone more to complication such as recurrent infections in early life and later complications in adulthood such as obesity, diabetes and other chronic disease. Emphasis on educating primigravidas on breast-feeding should be put on the importance of early initiation. Unhealthy infants appear to have less chance to early breast-feeding in comparison to the healthy infants. The implication of this is that unhealthy infant may have additional risk of being not breastfed earlier in life and therefore will be prone to infection. The late initiation also may decrease their duration of breastfeeding. Health care providers including nurses covering antenatal care and midwives should stress on the mother if she was diagnosed during antenatal period to have any congenital malformation or was diagnosed immediately after delivery to initiate breastfeeding early to prevent complications to such child. Doctor or medical staff for better initiation should provide care immediately after delivery. The implication of this is that if there is no care provided immediately after delivery by doctor or medical staff, there will decrease the initiation rate with a risk that may affect the neonatal survival. It is recommended to train the obstetricians, nurses and midwives if not possible to provide breastfeeding specialist in every maternity and general hospital and that specialist should attend immediately after delivery to provide this care in the first hour after delivery. Bottle milk gift significantly affect breast-feeding initiation negatively and it is recommended that BFHI polices should be strictly instituted to avoid giving formula milk. In the study there was no relation found between husband support, baby maturity and mother age and breast-feeding initiation.

Maternal choice of breastfeeding method was significantly associated with duration of breastfeeding and then the infant will get more benefit from breastfeeding. It is recommended to overcome the obstacles to breastfeeding in order to increase duration of breastfeeding. Using pacifier to the infants can affect duration of breastfeeding. It is recommended to encourage mothers not to use pacifiers. This can be achieved by strictly applying BFHI policies. Mother return to work was a significant factor affecting exclusivity of breastfeeding therefore Infant of working mothers will be at risk of early weaning. Child of employed and student mothers will have more risk of respiratory ,diarrheal and allergic disease in

their early life and later may have more risk to have obesity, diabetes and other morbidities. It is recommended to implement breast-feeding breaks or establishing nurseries at work place by health care planers at higher level to direct business and non business owners.

Mother satisfaction with infant feeding is significantly related to duration of breastfeeding in a positive way. It is recommended that during breastfeeding education sessions mothers should be asked about their altitude towards breastfeeding, previous experience of breastfeeding, her previous satisfaction as hints for educator to modify the education sessions accordingly and involvement of peer support in PHC. Mother who had assisted delivery would be more likely to choose mixed type of feeding. With this result the infants of mothers who had assisted delivery will be more prone to risk of mixed feeding. UNCEF states " *mixed type of feeding can increase the chance of their getting diarrhea and other infectious diseases"* and decrease the milk supply to infants. It is recommended to give early and continuous support in the postpartum period with special care to high risk mothers; assisted at delivery. Home visits or telephone calls during postpartum period should be encouraged and provided by Antenatal care nurse. Less parous women and primigravidas are more likely to decide to choose mixed type of feeding probably due to inexperience or bad experience with breast-feeding and possibly because they are likely to be working mothers. In the latter group of mothers, infants would be at risk of not being breastfed. It is recommended that Primigravidas and mothers with less than three children should receive more education sessions on the importance of early initiation of breast-feeding and exclusivity of breast-feeding throughout their Antenatal care visits. There is equivocal evidence on the use of pacifiers. To give mothers the benefit of doubt they should be advised to avoid use of pacifiers. Delaying the breastfeeding decision time is factor associated with decreased likelihood of breastfeeding decision rate after delivery and more likely to increase decision toward using mixed type of feeding with its complication. It can be recommend educating all childbearing age women by media, at schools and at PHC setting about breastfeeding.

This study was not intended to evaluate the BFHI was supposedly started more than ten years ago. However, our results in initiation and exclusivity of breastfeeding indicate clearly that there is ineffective implementation / the initiative did not exist anymore due to negligence or it is no longer adopted by the MOH.

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