

A CROSS SECTIONAL STUDY ON PREVALENCE OF EARLY INITIATION OF BREAST FEEDING PRACTICES AMONG MOTHERS DELIVERED IN HOSPITALS IN AND AROUND CHENNAI

Shalini S^{1*}, Abiselvi A², Gopalakrishnan S³, Madhura Vani B⁴ and Bhaskar Reddy K⁵

¹Assistant Professor, Department of Community Medicine, Bharath Medical College, Selaiyur, Chennai-600073, Tamil Nadu, India

²Assistant Professor, Department of Community Medicine, Thoothukudi Medical College, Kamaraj Nagar, Thoothukudi-628008, Tamil Nadu, India

³Professor, Department of Community Medicine, SreeBalaji Medical College and Hospital, Chromepet, Chennai-600044, Tamil Nadu, India

⁴Assistant Professor, Department of Community Health Nursing, Sri Venkateswara College of Nursing, RVS Nagar, Chittoor-517127, AP, India

⁵Professor & Director, Centre for Pharmaceutical Nanotechnology, Sri Venkateswara College of Pharmacy, RVS Nagar, Chittoor-517127, AP, India

***Corresponding Author**

Dr. Shalini S

Abstract

Breast feeding is a natural process and standard way of feeding the baby. Breast milk is widely acknowledged as the most complete form of nutrition for infants with the range of benefits for infant's health, growth, immunity and development. It enhances the cognitive and sensory development of a child. Breast feeding is a cost effective way to reduce the infant mortality and morbidity. Breast feeding reduces the neonatal mortality rate there by infant mortality rate which considerably reduces the under- five mortality rate. Hence it helps in achieving goal 4 - reduce child mortality, in the Millennium Development Goals. World Health Organization recommends the practice of early initiation of breast feeding with exclusive breast feeding up to 6 months and continues till 2 years along with complementary feeding. The study was aimed to identify the remedial measures for enhancing the prevalence of early initiation of breast feeding practices in the study area. The socio economic scores of the Urban mothers shows 16%, 32%, and 51.9% belonging to upper middle, lower middle and upper lower income groups respectively. Whereas in rural mothers the socio economic scores were 49.8%, 42.5%, 6.8% and 0.9% belonging to upper, upper middle, lower middle and upper lower income groups respectively. 49.8% of mothers from rural areas and 62.1% of mothers from urban areas initiated breast feeding within one hour of delivery. 37.9% of mothers from rural areas and 50.2% of mothers from urban areas initiated breast feeding after one hour of delivery. It is statistically significant ($\chi^2 = 6.9$, $p = 0.01$) with odds ratio of 1.6 (1.14 – 2.41). This study shows a better prevalence among rural mothers (52.3%) than urban mothers (58.8%) which coincide with NFHS – 3 (2005) data of Tamil Nadu. Complications in mother and neonate can be reduced to some extent by regular antenatal check-up. In caesarean delivered mothers, early initiation of breast feeding can be made better by the positive attitude of the mother and encouragement of the family members. Knowledge about the advantages of good breast feeding practices and particularly importance of early initiation of breast feeding may improve the current status of early initiation of breast feeding. Giving prelacteal feeds like sugar solution, water, cow's milk, formula milk by the influence of cultural factors and as an artificial feed can be reduced by explaining its disadvantages to the mothers from the antenatal period itself. The support system available and the recommendations of the hospital and health professionals may play a major role in early initiation of breast feeding.

Keywords: Early Initiation of Breast Feeding, Cross Sectional Study, pregnancy, Chennai.

INTRODUCTION:

Breast feeding is a natural process and standard way of feeding the baby⁽¹⁾. Breast milk is widely acknowledged as the most complete form of nutrition for infants with the range of benefits for infant's health, growth, immunity and development⁽²⁾. It enhances the cognitive and sensory development of a child. Breast feeding is a cost effective way to reduce the infant mortality and morbidity. Breast feeding

reduces the neonatal mortality rate there by infant mortality rate which considerably reduces the under- five mortality rate. Hence it helps in achieving goal 4 - reduce child mortality, in the Millennium Development Goals⁽¹⁾. World Health Organization recommends the practice of early initiation of breast feeding with exclusive breast feeding up to 6 months and continues till 2 years along with complementary feeding⁽³⁾.

According to World Health Organization, starting breast feed within 1 hour is referred to as “early initiation of breast feeding”⁽⁴⁾. As per, Indian Academy of Pediatrics guidelines, breast feeding must be initiated as early as possible after the birth, for all normal newborns including those born by caesarean section avoiding delay beyond an hour⁽⁵⁾. Early initiation of breast feeding saves over 1 million newborn infants every year⁽⁶⁾. It reduces about 22% of neonatal mortality rate⁽¹⁾. In spite of its known advantages, several factors related to the mother and the child affect early initiation of breast feeding. This includes mother’s knowledge about benefits of breast feeding, problems faced during nursing, mother’s socio- cultural & economic situation, the attitude, the support system available, the recommendation of hospital & health professionals, hospital and national policies, etc⁽⁷⁾.

Colostrum is considered as “liquid gold and gift of life.”⁽⁸⁾ World Health Organization universally recommends colostrum, a mother's first milk, as the perfect food and the 'very first food' for every newborn. *It is a thick, yellowish fluid secreted by mother for first 2-4days*⁽⁹⁾. Human colostrum provides nutritional factors, immune factors and growth factors, which plays a role in tissue development, growth of a child and prevention of infection⁽¹⁰⁾. It is rich in vitamin A and protein compared to mature milk. It is considered as the first immunisation that a child receive from the mother.⁽¹¹⁾ It contains immunoglobulins, lactoferrin and lysozyme which may help to reduce and protect against neonatal septicaemia, diarrhoea, and acute respiratory infections, thus reducing infant mortality rate.⁽¹²⁾

Aim: To identify the remedial measures for enhancing the prevalence of early initiation of breast feeding practices in the study area.

Objective:

1. To identify the reasons for delay in initiation of breast feeding.
2. To study the association between the prevalence of early initiation of Breast feeding with :
 - Socio- demographic variables
 - Obstetric history
 - Neonatal history
 - Prolactal feeds

Methodology:

Study design:

This study is a hospital based cross-sectional study. The prevalence of early initiation of breast feeding and probable reasons for its delay was recorded from the mothers who were admitted for delivery in the hospitals in and around Chennai.

Study population:

The study population identified was any mothers who had delivered the babies (normal as well as cesarean section) in the selected government hospitals, within 48 hours.

Study area:

This study was done in hospitals in and around Chennai. Hence the catchment area included both urban and rural population from northern districts of Tamil Nadu like Kanchipuram, Tiruvallur and Chennai. Official Permission was granted for carrying out the study in Primary Health Centres, District Head Quarters Hospital Tiruvallur District and Institute of Obstetrics & Gynaecology, Chennai. The district is subdivided into 13 Blocks. There are 13 Block Level PHCs, 6 Upgraded PHCs [CHCs], 24 Additional PHCs, 3 Urban PHCs, 8 Taluk & Non-taluk hospitals and 1 District Head Quarters Hospital which caters to all the health care needs of the people of this District. Recently 6 more new PHCs were also added to the existing list. All these institutions are based on the primary and secondary health care level. The nearest Tertiary care hospitals are located in Chennai which is bordering the Tiruvallur district [attached to the Madras Medical College, Stanley Medical College and Kilpauk Medical College].

Study period:

The study was carried out from July 2013 till June 2014.

Inclusion criteria:

1. All normally delivered post natal mothers with live babies who were willing to take part in the study.
2. All caesarean delivered mothers who were willing to take part in the study.
3. All post natal mothers who initiated breastfeeding at the time of data collection.

Exclusion criteria:

1. Any serious illness in the child like birth injuries, severe jaundice and congenital anomalies.
2. Twin deliveries.
3. The mothers under influence of sedation and post partum psychosis.

Sample size:

According to NFHS – 3 data, the prevalence of early initiation of breast feeding in Tamil Nadu was found to be 58.8%⁽¹⁶⁾. Taking this prevalence rate as the standard value for Tamil Nadu, the sample size was calculated using the formula:

$$N = \frac{Z^2 \times p \times q}{L^2}$$

Where,

Z = 1.96 at 96% confidence limit at 95% confidence limit.

P = Prevalence of disease / event.

Q = 100 - P

L = allowable error (conventionally allowed up to 20% of prevalence).

Substituting it in the formula,

$$N = \frac{1.96 \times 1.96 \times 58.8 \times 41.2}{4.7 \times 4.7}$$

$$N = 421$$

$$P = 58.8, q = 41.2, D = 4.7, Z = 1.96$$

The calculated sample size of 421 was increased to make a round figure as 450 samples.

Sampling Methods:

The study centres were selected based on Multistage, stratified random sampling method. There are 13 Block PHCs, 8 Taluk hospitals and 1 District Head Quarters Hospital in the district. Among all block PHCs 5 were randomly selected and a 10 days visit was planned in each PHC. All eligible samples of deliveries were included in the study by consecutive sampling from those PHCs till 150 samples were reached. In secondary health care level, permission was obtained to collect data from Tiruvallur Head Quarters Hospital. The nearest Tertiary Care hospital is Institute of Obstetrics & Gynaecology, located in Chennai which is attached to the Madras Medical College. Similarly from both secondary and tertiary level a consecutive sampling was done till 150 samples were reached. The data collection was done from among the three levels of health care delivery system, to give more representation of the target population in the study sample. Data was collected among postnatal mothers who delivered in these hospitals within 48 hours of delivery. The list of hospitals from where the data was collected is attached in Annexure.

Data collection:

An official permission was obtained from the Guide, the Head of the Department and the Dean of Sri Balaji medical college

and hospital, Chrompet for carrying out this thesis work. The data collection was started after obtaining permission from The Director of Institute of Obstetrics and Gynecology, Egmore, Chennai, Joint Director of Health Services and Deputy Director of Health Services, Tiruvallur district. The data was collected from three levels of health care centre – primary health care centre, secondary health care centre from Tiruvallur district and tertiary health care centre from Chennai.

Data collection period:

The data was collected for a period of 3 months from February 2014 to April 2014.

Data analysis:

Data analysis includes descriptive and analytical statistics. The descriptive statistics like mean, frequency distribution and percentage is used to assess the various variables. The analytical statistics like P-value, Chi-square, Odds ratio and Confidence interval were used to determine the association of early initiation of breast feeding with selected variables. EPIDATA and SPSS free trial version 12 are the statistical tool/ software used to apply different tests and to analyze the data.

Results:

The study was conducted in three levels of health care centres, i.e., primary, secondary and tertiary hospitals in and around Chennai.

Table – 1. Socio economic variables of mothers

	Characteristics	No	%
1.	Educational distribution of the mother		
	Illiterate	27	6.0
	Primary	64	14.2
	Secondary	205	45.6
	Higher secondary	97	21.6
	Graduate	57	12.7
2.	Occupational distribution of the mother		
	Skilled	11	2.4

	Semi-Skilled	428	95.1
	Unskilled	11	2.4
3.	Socioeconomic status score for Urban (Kuppaswamy Scale) [n = 231]		
	Upper middle	37	16
	Lower middle	74	32
	Upper lower	120	51.9
4.	Socioeconomic status score for Rural (B. G. Prasad Scale) [n = 219]		
	Upper	109	49.8
	Upper middle	93	42.5
	Lower middle	15	6.8
	Upper lower	2	0.9

Among the study subjects, 94% were literate and 6% were illiterate (Table-2). In the literate study subjects, majority of 205 (45.6%) mothers had the level of secondary education followed by higher secondary education in 97(21.6%) mothers, primary education in 64(14.2%) mothers and graduate in 57 (12.7%) mothers.

Out of 450 mothers, house wives were 428 (95.1%) where as skilled and unskilled were 11 (2.4%) each.

The socio economic scores of the Urban mothers shows 16%, 32%, and 51.9% belonging to upper middle, lower middle and upper lower income groups respectively. Whereas in rural mothers the socio economic scores were 49.8%, 42.5%, 6.8% and 0.9% belonging to upper, upper middle, lower middle and upper lower income groups respectively.

Table – 2.Delivery particulars of the study subjects

	Characteristics	No	%
1.	Place of delivery		
	Primary Health Centre	150	33.3
	Secondary Health centre	150	33.3
	Tertiary Health Centre	150	33.3
2.	Birth Order of the child		
	1 st	169	37.6
	2 nd	241	53.6
	3 rd	40	8.8

3.	Term of delivery		
	Pre term	7	1.6
	Term	437	97.1
	Post term	6	1.3
4.	Mode of delivery		
	Normal	216	48.0
	Caesarean	234	52.0
6.	Time of Delivery		
	7:00 a.m-2:00 pm	198	44.0
	2:00 pm-7:00 pm	82	18.2
	7:00 pm-7:00 am	170	37.8

Related to the place of delivery (Table-4), among 450 mothers, 150 were selected from primary health centres, 150 mothers from secondary health centres and 150 mothers from tertiary health centres were involved in this study.

Regarding birth order of the child 169 (37.6%) mothers gave birth to first child, 241(53.6%) mothers gave birth to second child and 40(8.8%) mothers gave birth to third child.

Out of 450 deliveries, 437(97.1%) were term deliveries while 7(1.6%) were pre-term and 6 (1.3%) were post term deliveries. Also in the study group 234 (52%) were caesarean section deliveries and 216 (48%) were normal deliveries. All the caesarean section deliveries were conducted under spinal anaesthesia.

In 450 deliveries, 44% of the deliveries happened between 7 am to 2pm (shift 1), 18.2% of deliveries happened between 2 pm to 7pm (shift 2) and 37.8% of deliveries happened between 7 pm to 7 am (shift 3). This shift was divided based on nurse's duty in the health centres.

Table – 3. Complications during delivery

	Characteristics	No	%
1.	Complications during delivery		
	Foetal distress	18	4.0
	Meconium stain	11	2.4
	Meconium stain with Foetal distress	6	1.3
	None	415	92.2

2. Assistance adopted in Normal delivery [n = 216]		
Episiotomy	172	79.6
Episiotomy & Forceps	21	9.7
None	23	10.6

Regarding complication during delivery (Table-5), 92.2% of newborns had no complications while 4% of newborns had foetal distress, 2.4% had meconium stained liquor and 1.3% had both together.

Out of 216 normal deliveries, 23 deliveries were conducted without any assistance, whereas 172 deliveries were assisted with episiotomy and 21 deliveries were assisted with forceps and episiotomy.

Table: IV Details of the New born

	Characteristics	No	%
1.	Birth weight of the child		
	< 2	17	3.8
	2.1 – 2.5	92	20.4
	2.6 – 3.0	192	42.7
	3.1 – 3.5	117	26
	3.6 – 4.0	29	6.5
	> 4.1	3	0.7
2.	Apgar score		
	Good (> 7 points)	423	94
	Poor (4-6 points)	25	5.6
	Very poor (< 4 points)	2	0.4
3.	Complications of neonate		
	LBW	17	3.8
	Respiratory Distress	24	5.3
	Jaundice	17	3.8
	Others	4	0.9
	Normal	388	86.2

Regarding birth weight of the child (Table-8), 3.8% of the babies were low birth weight babies (i.e., less than 2 kilograms) and 20.4% babies were between 2.1 - 2.5 kilograms. About 42.7%, 26% and 7% were born between 2.6 – 3, 3.1 – 3.5 and more than 3.5 kilograms respectively.

Out of 450 newborns, APGAR score was above 7 points in 94% of the babies, between 4- 6 points in 5.6% babies and below 4 points in 0.4% of babies.

Complications of neonate in this study were respiratory distress (5.3%), low birth weight (3.8%), jaundice (3.8%), and others (0.9%) like ophthalmic problems and renal problems.

Table – 5. Breast feeding practices among the study subjects

	Characteristics	No	%
1.	Suckling reflex after initiation of breast feeding		
	Immediately	443	98.4
	Delayed	7	1.6
2.	Suckling started after initiation of breast feeding		
	0-5 Hour	445	98.8
	6-10 Hour	1	0.2
	11-15 Hours	2	0.4
	>15 Hours	2	0.4
3.	Prelacteal feeds		
	Sugar solution	18	4
	Water	34	7.5
	Sugar solution and water	12	2.6
	Formula milk	3	0.7
	Cow's milk	16	3.5
	Others	4	0.9
	No feeds given	363	80.7

Suckling reflex of babies (Table-9) were good among 98.4% babies where as 1.6% of the babies felt it difficult.

Out of 450 babies, 87 babies were fed with prelacteal feeds. 7.5%, 6.6%, 3.5%, 0.9%, 0.7% of the babies were fed with lukewarm water, sugar solution, Cow's milk, others which include tea and donkey's milk and formula milk respectively.

Table-6. Delay in early initiation of breast feeding

No. of hrs of delay	Total no. of hours delayed	No. of deliveries	Mean delay	SD
Normal delivery	443	216	2.05	
Caesarean delivery	1014	234	4.33	

Total	1457	450	3.24	
-------	------	-----	------	--

The mean delay in early initiation of breast feeding (Table-12) among normally delivered mothers and caesarean delivered mothers were 2.05 and 4.33 hours respectively.

Table: 7. Association between early initiation of breast feeding and demographic variables of the mother.

characteristic	N	Delayed initiation of breast feeding		Chi-square	P- value	Odds Ratio	95% Confidential Interval
		No	%				
Age of mother							
≥26 years	141	79	56	13.6	0.01	2.0	1.3 - 3.0
≤ 25 years	309	120	38.8				
Sex of the child							
Male	240	109	45.4	0.3	0.6	1.1	0.7 - 1.6
Female	210	90	42.9				
Place of residence							
Urban	231	116	50.2	6.9	0.01	1.6	1.1 - 2.4
Rural	219	83	37.9				
Educational status of the mother							
Up to grade 10	296	128	43.2	0.4	0.6	0.8	0.6 - 1.2
Above grade 10	154	71	46.1				

Table: 13 Shows the association between early initiation of breast feeding and demographic variables of the mother. Regarding the age of the mother and early initiation of breast feeding, there is a significant association between the both. The mothers aged ≥26 years delayed the initiation of breast feeding with an odds ratio of 2.01 (1.34 - 3.0) which is statistically significant ($\chi^2 = 13.6$ and $p = 0.01$).

About 45.4% of male babies and 42.9% of female babies were breast fed after 1 hour of delivery. There is no association between sex of the child and early initiation of breast feeding because it is statistically not significant ($\chi^2 = 0.3$, $p = 0.6$).

There is a significant association between the place of residence and early initiation of breast feeding. 37.9% of mothers from rural areas and 50.2% of mothers from urban areas initiated breast feeding after one hour of delivery. It is statistically significant ($\chi^2 = 6.9$, $p = 0.01$) with odds ratio of 1.6 (1.1 - 2.4)

About 43.2% of illiterate and 46.1% of literate mothers initiated breast feeding after one hour of delivery. There is no significant association between educational status of the mother and early initiation of breast feeding ($\chi^2 = 0.3$, $p = 0.2$).

Table 8. Association between early initiation of breast feeding and antenatal problems.

characteristics	Total no.	After 1 hr		Chi-square	P- value	Odds Ratio	95% Confidential Interval
		No	%				
Medical problems during antenatal period							
Problem present	33	16	48.5	0.3	0.6	1.2	0.6 - 2.5
Problems absent	417	183	43.9				
Risk factors in antenatal period							
Risk factors present	99	63	63.6	19.4	0.01	2.8	1.7 -4.4
Risk factors absent	351	136	38.7				
Breast symptoms							
Symptoms present	16	10	62.5	2.3	0.1	2.2	0.8- 6.1
Symptoms absent	434	189	43.5				

The maternal medical problems and the early initiation of breast feeding (Table-14) had no significant association between each other. Among 33 mothers who had maternal medical problems, 16 mothers (48.5%) initiated breast feeding after one hour of delivery. Statistically it is not significant ($\chi^2 = 0.3$, $p = 0.6$).

The risk factors during antenatal period of the mother had a significant effect on early initiation of breast feeding. Among 99 mothers with risk factors present during pregnancy, 63 (63.6%) mothers initiated breast feeding after one hour. The association was found statistically significant with odds ratio of 2.8 (1.7 – 4.4) ($\chi^2 = 19.4$, $p = 0.01$).

There is no association between breast symptoms in the mothers and early initiation of breast feeding ($\chi^2 = 2.3$, $p = 0.1$). 62.5% of mothers with breast symptoms and 43.5% of mothers without breast symptoms, initiated breast feeding after one hour of delivery.

Table: 9. Association between early initiation of breast feeding and delivery particulars.

characteristics	Total no.	After 1 hr		Chi-square	P- value	Odds Ratio	95% Confidential Interval
		No	%				
Place of delivery							
Primary & secondary health centre	300	103	34.3	36.0	0.01	3.4	2.3 -5.1
Tertiary health centre	150	96	64				
Mode of delivery							
Caesserean delivery	234	137	58.5	40.6	0.01	3.5	2.4 - 5.2
Normal delivery	216	62	28.7				
Time of delivery							

7am – 7pm	280	127	45.4	0.4	0.5	1.1	0.8-1.7
7pm-7am	170	72	42.4				

Out of 300 mothers delivered (Table-15) in primary and secondary health centre and out of 150 mothers delivered in tertiary health centre, 103 mothers (34.3%) and 96 mothers (64%) initiated breast feeding after one hour of delivery respectively. Hence, there is a significant association between place of delivery and early initiation of breast feeding with an odds ratio of 3.4 (2.3 – 5.1). The association was identified as statistically significant ($\chi^2 = 36.0$, $p = 0.01$).

The mode of delivery had seen to influence the early initiation of breast feeding among mothers. About 28.7% of normally delivered and 58.5% of caesarean delivered mothers initiated breast feeding after one hour of delivery. Association between both has been observed with an odds ratio of 3.5 (2.4– 5.2) which is statistically significant ($\chi^2 = 40.6$, $p = 0.01$).

There is no association between time of delivery and early initiation of breast feeding. About 45.4% of deliveries happened between 7am – 7 pm and 42.4% of deliveries happened between 7pm – 7 am, initiated breast feeding after one hour of delivery. It is statistically not significant ($\chi^2 = 0.4$, $p = 0.5$).

Table: 10. Association between early initiation of breast feeding and Neonatal details.

characteristics	Total no.	After 1 hr		Chi-square	P-value	Odds Ratio	95% Confidential Interval
		No	%				
Birth order of child							
First child	169	95	56.2	15.8	0.01	2.2	1.5- 3.2
More than one child	281	104	37				
Birth weight of child							
Less than 2.5 kg	61	30	49.2	0.7	0.40	1.3	0.7- 2.2
2.5 kg and above	389	169	43.4				
Complication in neonate							
Problem present	62	41	66.1	14.0	0.01	2.8	1.6- 4.9
Problem absent	388	158	40.7				

The birth order of the child and early initiation of breast feeding (Table-16) had no significant association. Mothers with first child had delayed the initiation of breast feeding compared to the mothers with more than one child with an odds ratio of 2.2 (1.5 - 3.2). It is statistically not significant ($\chi^2 = 15.8$, $p = 0.01$).

Regarding birth weight of the child and early initiation of breast feeding, 49.2% of children weighing < 2.5 kilograms and 43.4% of children weighing \geq 2.5 kilograms were breast fed after one hour of delivery. It is statistically not significant ($\chi^2 = 0.7$, $p = 0.4$).

66.1% of neonates with complications and 40.7% of neonates without complications were able to breast feed within one hour of delivery. There is an association between complication in neonate and early initiation of breast feeding with an odds ratio of 2.8 (1.6 – 4.9) which is statistically significant ($\chi^2 = 14.0$, $p = 0.01$).

Table: 11. Association between early initiation of breast feeding and prelacteal feed.

characteristics	Total no.	After 1 hr		Chi-square	P-value	Odds Ratio	Confidential Interval (95%)
		No	%				
Prelacteal feed given	87	49	56.3	0.01	0.9	1.0	0.6 – 1.7
No prelacteal feed given	363	202	55.6				

Prelacteal feeds (Table-17) had no influence on early initiation of breast feeding. 56.3% of mothers who practiced prelacteal feeds didn't initiated breast feeding within one hour of delivery. It is statistically not significant ($\chi^2 = 0.01$, $p = 0.9$).

Table: 12. Association between early initiation of breast feeding and Donor's milk.

characteristics	Total no.	After 1 hr		Chi-square	P-value	Odds Ratio	95% Confidential Interval
		No	%				
Donor's milk given	59	50	84.7	23.1	0.01	5.3	2.5- 11.0
Donor's milk not given	391	201	51.4				

Statistical significance ($X^2 = 23.1$, $p = 0.01$) was seen in donor's milk feeding (Table-18) and early initiation of breast feeding. The odd ratio of which is 5.3 (2.5 – 11.0)

Table- 13 Association between selected variables and Secretion of Breast milk

characteristics	Total no.	Delay of breast milk secretion on initiation of breast feeding		Chi-square	P-value	Odds Ratio	95% Confidential Interval
		No	%				
Medical problems during antenatal period							
Problems present	33	5	15.2	0.5	0.5	1.4	0.5- 3.8
Problems absent	417	47	11.3				
Birth order of the child							
First child	169	28	16.6	6.7	0.01	2.1	1.2- 3.8
More than one child	281	24	8.5				
Mode of delivery							
Caesserean delivery	234	38	16.2	10.5	0.01	2.8	1.5-5.3
Normal delivery	216	14	6.5				

Association between medical problems during antenatal period and secretion of breast milk

84.8% of mothers with maternal medical problems and 88.7% of mothers with no maternal medical problems had no delay in secretion of breast milk. There is no significant association between medical problems during antenatal and breast milk secretion with an odds ratio of 1.41 (0.5- 3.8) ($\chi^2= 0.5, P = 0.5$).

Association between birth order of the child and breast milk secretion

There is an association between birth order of the child and breast milk secretion. 83.4% of mothers with first child and 91.5% of mothers with more one child had no delay in secretion of breast milk. It is statistically significant ($\chi^2 = 6.7, p = 0.01$) with an odds ratio of 2.1 (1.2- 3.8).

Association between mode of delivery and breast milk secretion

83.8% of caesarean delivered mothers and 93.5% of normally delivered mothers had no delay in secretion of breast milk. It is statistically significant ($\chi^2 = 10.5, p = 0.01$) with an odds ratio of 2.8 (1.5- 5.3)

Table: 14. Association between reason for delay and mode of delivery.

characteristics	Total no.	Caesarean delivery		Normal delivery		Chi-square	P- value	Odds Ratio	95% Confidential Interval
		No	%	No	%				
Reason for delay in early initiation of breast feeding									
Maternal causes	149	93	37.8	56	22.8	8.7	0.01	0.4	0.2-0.7
Fetal causes	63	51	20.7	12	4.9				
Others	34	19	7.7	15	6.1				

22.8% of Normal delivered and 37.8% of caesarean delivered mothers (Table-20) delayed the initiation of breast feeding due to maternal causes. Likewise 4.9% of Normal delivered and 20.7% of caesarean delivered mothers delayed the initiation of breast feeding due to fetal causes.

Discussion

The mothers aged ≤ 25 years initiated the breast feeding within 1 hour where as the mothers aged ≥ 26 years delayed the initiation of breast feeding with an odds ratio of 2.0 (1.3 - 3.0) which is statistically significant ($\chi^2 = 13.6$ and $p = 0.01$). This study was supported by a study done by Sarmila Mallik showing a negative influence on increasing age of mothers. Knowledge score was good in 80.5% mothers below 20 years, 89.8% between 20-25 years, 91.2% between 26-30 years and 100% in mothers above 30 years. The difference was significant between the age groups of below 20 years and 20-25 years, but not significant between other age groups. Almost equal proportion of mothers (66.1% and 66.2%) with good and poor knowledge score put their babies to breast immediately. It also coincided with the result of adverse effects of early initiation of breast feeding below 20 years of age.⁽¹³⁾ Where as in other study done by Jessica R. Jones shows maternal age had no influence on initiation of breast feeding.⁽¹⁴⁾

In this study about 54.6% of male babies and 57.1% of female babies were breast fed within 1 hour after delivery and 45.4% of male babies and 42.9% of female babies were breast fed after 1 hour of delivery. There is no association between sex of the child and early initiation of breast feeding because it is statistically not significant ($\chi^2 = 0.3, p = 0.6$). The

results of some selected countries shown in global health observatory data repository – western pacific region (2001 - 2010) coincides with this above data.⁽¹⁵⁾

49.8% of mothers from rural areas and 62.1% of mothers from urban areas initiated breast feeding within one hour of delivery. 37.9% of mothers from rural areas and 50.2% of mothers from urban areas initiated breast feeding after one hour of delivery. It is statistically significant ($\chi^2 = 6.9, p = 0.01$) with odds ratio of 1.6 (1.14 – 2.41). This study shows a better prevalence among rural mothers (52.3%) than urban mothers (58.8%) which coincide with NFHS – 3 (2005) data of Tamil Nadu.⁽¹⁶⁾

About 66.7% of illiterate and 55.1% literate mothers initiated breast feeding within one hour of delivery whereas 43.2% of illiterate and 46.1% of literate mothers initiated breast feeding after one hour of delivery. There is no significant association between educational status of the mother and early initiation of breast feeding ($\chi^2 = 1.4, p = 0.2$). Educational status of the mother had no significant effect on early initiation of breast feeding in this study. But in a study done by Katherine E heck had a significant effect on higher education level of mothers with early initiation of breast feeding.⁽¹⁷⁾

The maternal medical problems and the early initiation of breast feeding had no significant association between each other. Among 33 mothers who had maternal medical problems

17 mothers (3.8%) initiated breast feeding within one hour and 16 mothers (48.5%) initiated breast feeding after one hour of delivery. Statistically it is not significant ($\chi^2 = 0.3$, $p = 0.6$).

The birth order of the child and early initiation of breast feeding had no significant association with an odds ratio of 2.2 (1.5 - 3.2). It is statistically not significant ($\chi^2 = 15.7$, $p = 0.01$). Among the mothers with first child 43.8% of the mothers and 56.2% of the mothers initiated breast feeding within one hour and after one hour of delivery respectively. Whereas among the mothers with more than one child 63% of the mothers and 37% of the mothers initiated breast feeding within one hour and after one hour of delivery respectively. But according to a study conducted by Tori Sutherland, Christopher B. Pierce the results were in reverse showing an increasing trend of non- initiation with increasing birth order⁽¹⁸⁾.

Regarding birth weight of the child and early initiation of breast feeding, 50.8% of children weighing < 2.5 kilograms and 56.6% of children weighing \geq 2.5 kilograms were breast fed within one hour of delivery whereas 49.2% of children weighing < 2.5 kilograms and 43.4% of children weighing \geq 2.5 kilograms were breast fed after one hour of delivery. It is statistically not significant ($\chi^2 = 0.7$, $p = 0.4$). This study was supported by the study done by EmelÖrün et al., showed that birth weight had no effect on early initiation of breastfeeding.⁽¹⁹⁾

33.9% of neonates with complications and 59.3% of neonates without complications were able to breast feed within one hour of delivery. 66.1% of neonates with complications and 40.7% of neonates without complications were breast feed after one hour of delivery. There is an association between complication in neonate and early initiation of breast feeding with an odds ratio of 2.8 (1.6 - 5.0) which is statistically significant ($\chi^2 = 14.0$, $p = 0.01$). This study correlates with the study done by Anaiappan showing the influence of neonatal complications on initiation of breast feeding.⁽²⁰⁾

There was a significant association between mode of delivery and breast milk secretion ($\chi^2 = 10.5$, $p = 0.01$). Mothers who underwent caesarean delivery had a delay in breast milk secretion with an odds ratio of 2.8 (1.5 - 5.3) 83.8% of caesarean delivered mothers and 93.5% of normally delivered mothers had no delay in secretion of breast milk. Health care personnel involved in conduction of labour should initiate breast feeding as early as possible without delay in handing over the baby.

The prevalence rate of Secretion of breast milk on initiation of breast feeding, Prolactal feeds given, Complications in neonate, Low birth weight babies, Anemia in mother, Pregnancy induced hypertension, Gestational diabetes and Breast symptoms in mother was 88.4%, 19.3%, 13.8%, 3.8%, 12.2%, 6.2%, 4.6% and 3.5% respectively.

According to Indian standards of Public Health, all the babies delivered in the primary and community health care facilities should be breast fed within one hour after delivery with a minimum stay of 48 hours.^(21, 22)

Limitations of the study

1. Only the mothers who were admitted in the government hospitals were included in the study. Cultural variations between government and private hospitals could not be addressed.
2. This study shows a lower prevalence of early initiation of breast feeding for mothers delivered in tertiary care hospitals. This may not reveal the actual situation in the community because tertiary care centres receive complicated cases.

Conclusion:

Complications in mother and neonate can be reduced to some extent by regular antenatal check-up. In caesarean delivered mothers, early initiation of breast feeding can be made better by the positive attitude of the mother and encouragement of the family members. Knowledge about the advantages of good breast feeding practices and particularly importance of early initiation of breast feeding may improve the current status of early initiation of breast feeding. Giving prelacteal feeds like sugar solution, water, cow's milk, formula milk by the influence of cultural factors and as an artificial feed can be reduced by explaining its disadvantages to the mothers from the antenatal period itself. The support system available and the recommendations of the hospital and health professionals may play a major role in early initiation of breast feeding.

Summary:

Research design adopted for the study was Cross sectional study. A stratified random sampling method was used for sample selection. Three strata were included for the study i.e., primary, secondary and tertiary health centers. By simple random sampling method 5 primary health centers, 2 secondary health centers and 1 tertiary health center were selected. In each stratum 150 samples were selected by a purposive random sampling and it was done till the total sample size was reached.

The study was conducted in hospitals in and around Chennai, included northern districts of Tamil Nadu like Kanchipuram, Tiruvallur, Chennai. All the mothers who were admitted for delivery in the selected hospitals were included in the study. Before the data collection, all the participants were explained about the study and an informed consent was taken from each of them.

Regarding demographic variables of the 450 mothers in this study, 84.2% of mothers were between 21 - 30 years, 11.11% of mothers were less than 20 years and 4.67% of mothers were more than 30 years. 240 (53.3%) mothers delivered male baby and 210 (46.7%) mothers delivered female baby. 219 (48.7%) belongs to rural area and 231 (51.3%) belongs to urban area. The religion of study population included 395 (87.7%) Hindus, 33(7.3%) Christians and 22 (4.92%) Muslims.

Out of 450 mothers, 33 (7.4%) mothers had antenatal problems and 99 (22%) mothers were identified with risk factors during antenatal period. Regarding complications during delivery, 92.2% of newborns had no complications

while 4% of newborns had foetal distress, 2.4% had meconium stained liquor and 1.3% had both together.

Out of 450 mothers, 216 mothers had normal delivery and 234 had caesarean delivery. Regarding postnatal problems (42.4%) of mothers had pain in suture site and (3.6%) of mothers had breast symptoms like sore nipple, cracked nipple and inverted nipple.

Complications of neonate in this study were respiratory distress (5.3%), low birth weight (3.8%), jaundice (3.8%), and

others (0.9%) like ophthalmic problems and renal problems. Out of 450 babies, 87 babies were fed with prelacteal feeds.

A significant association has not been observed between early initiation of breast feeding and the selected variables like sex of the child, education of the mother, birth weight of the child and pre lacteal feeds.

There was a significant association between breast milk secretion and mode of delivery and birth order of the child.

REFERENCES:

1. Shwetal B, Pooja P, Neha K, Amit D, Rahul P. Knowledge, attitude and practice of postnatal mothers for early initiation of breast feeding in the obstetric wards of a tertiary care hospital Vadodara city. *National Journal of Community Medicine*. 2012;3(2):305-9.
2. Raj RJ, Sriram C, Yasobant S, Venkatesh R, Arunmozhivarman K, Maria JM. Breast Feeding Practices: A Predictor Based Study from Tiruvallur District, Tamilnadu. *OIRJ*. 2014 Mar-Apr; 4(2): 78-86.
3. Infant and Young Child Feeding Guidelines: 2010. Indian academy of paediatrics. Dr.SatishTiwari, Yashoda Nagar No.2, Amravati, 444606 Maharashtra, India.
4. Jana AK. WHO/ Interventions for promoting the initiation of breastfeeding 2009 http://apps.who.int/rhl/pregnancy_childbirth/care_after_childbirth/cd001688_JanaAK_com/en/.
5. Cakmak H, Kuguoglu S. Comparison of the breastfeeding patterns of mothers who delivered their babies per vagina and via cesarean section: An observational study using the LATCH breastfeeding charting system. *IJNS*. 2007 apr 18; 44(7): 1128-37.
6. Godhia ML, Neesah P. Colostrum – its Composition, Benefits as a Nutraceutical – A Review. *Curr Res Nutr Food Sci*. 2001 Jan 1; 1(1): 37-47. Available from: <http://www.foodandnutritionjournal.org/volume1number1/colostrum-its-composition-benefits-as-a-nutraceutical-a-review/>.
7. National guide lines on infant and young child feeding http://www.pediatriconcall.com/fordocor/Conference_abstracts/report.aspx?reportid=459.
8. United States Breast feeding committee. Economic benefits of breast feeding [issue paper]. Raleigh, Nc: United States breast feeding committee;2002. Available from: <http://medind.nic.in/nad/t11/i2/nadt11i2p53.pdf>.
9. Asha Susan varghes, a study to assess the knowledge and attitude on breast feeding among rural women 2014.
10. Ashmika mote et al, *journal of nutrition and metabolism*, 2011.
11. Emel O, Songul YS, Yusuf M, Zeynep U, Senaz K, Kadriye Y. Factors associated with breast feeding initiation time in a baby friendly hospital. *The Turkish journal of Pediatrics* 2010; 52(1):10-6. Available from: http://www.turkishjournalpediatrics.org/pediatrics/pdf/pdf_TJP_726.pdf.
12. Indian standards of public health. Guide lines for Community health centres. Revised 2012.
13. Indian standards of public health. Guide lines for primary health centres. Revised 2012.
14. World Health Organization. Early initiation of breastfeeding to promote exclusive breastfeeding. WHO. e-Library of Evidence for Nutrition Actions (eLENA). https://www.who.int/elena/titles/early_breastfeeding/en. (accessed May 30, 2020)
15. Ministry of Health and Family Welfare National Family Health Survey-4, 2015 -16, www.mohfw.nic.in. (accessed May 30, 2020)
16. Smith ER, Hurt L, Chowdhury R, et al. Delayed breastfeeding initiation and infant survival: A systematic review and meta-analysis. *PLoS One*. 2017;12(7):e0180722.
17. International Institute for Population Sciences: National Family Health Survey (NFHS-3): India (Mumbai: IIPS), 2005- 06
18. Aguayo VM, Gupta G, Singh G, Kumar R. Early initiation of breast feeding on the rise in India. *BMJ Glob Health*. 2016;1(2):e000043.
19. Praween Senanayake¹, Elizabeth O'Connor² and Felix Akpojene Ogb^{1,3*}. *BMC Public Health* (2019) 19:896.
20. Polineni V, Boralingiah P, Kulkarni P, Manjunath R. A Comparative Study of Breastfeeding Practices Among Working and Non-Working Women Attending a Tertiary Care Hospital, Mysuru. *Ntl J Community Med* 2016; 7(4):235- 240.
21. Sharma, I.K., Byrne, A. Early initiation of breastfeeding: a systematic literature review of factors and barriers in South Asia. *Int Breastfeed J*. 112016;17.
22. Vijayalakshmi P, Susheela T, Mythili D. Knowledge, attitudes, and breast feeding practices of postnatal mothers: A cross sectional survey. *Int J Health Sci (Qassim)*. 2015 Oct; 9(4) : 364-74.