Breastfeeding Self-Efficacy Score with Lactational Mastitis a Cross Sectional Study in a Family Health Unit, Sharkia Governorate,Egypt

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Abstract:
Background: Mastitis is an infection of the tissue of the breast that occurs most frequently during the time of breastfeeding. About 1%-3% of breastfeeding mothers develop mastitis. Engorgement and incomplete breast emptying can contribute to the problem and make the symptoms worse. Mastitis can occur with or without the presence of infection. As it progresses, mastitis can cause the formation of a breast abscess. Severe cases of mastitis can be fatal if left untreated. **Objectives:** To assess the prevalence and risk factors of mastitis in lactating females and to determine breastfeeding self-efficacy for cases of mastitis. **Method:** A cross sectional study in a family health unit in Sharkia governorate on women who gave birth to a healthy term infant, attending El- Aslogy family health unit for the 4th dose of child vaccine. Interviewed in the vaccination room for the occurrence of mastitis and its risk factors and breastfeeding self-efficacy-short form. **Results:** 20% of the studied lactating females developed mastitis. Three quarters of mastitis cases have no previous history of mastitis (75%), 75% suffered from nipple cracks and 70% wore bra during sleep. The mean score of Breast-feeding Self-efficacy Scale is statistically higher with non-mastitis than with mastitis (50.84 ± 8.48 versus 32.77±2.68) respectively ($p<0.001$). **Conclusion:** There is statistical significant difference between mastitis cases and female without mastitis regarding nipple cracks and breast congestion, lactating duct obstruction, wearing breast bra during sleep and using milk suction. Breast-feeding Self-efficacy Score is higher with non-mastitis than with mastitis cases.
Key words: Risk factors, Nipple cracks, Family Medicine.

Introduction:Mastitis is mammary gland inflammation, which occurs in 20% of females. The infection either causes cellulitis when superficial, or causes adenitis when affects the lacteal ducts through nipple fissure.**(1)** It is categorized in to: Puerperal (known as Lactational Mastitis) and Non puerperal (Non lactational or Granulomatous Mastitis).(2) In lactational mastitis, microbes are transferred from the baby's mouth to the nipple fissure causing mastitis, especially that mom's milk promotes replication, and milk stasis aggravates mastitis and breast abscess occurs as a complication.(3)

Lactational mastitis occurs in one in seven of the breastfeeding moms, few of them are aware and educated by their health care providers about breastfeeding techniques. If there is no good hygiene or care of the breast during breastfeeding, infection occurs to the breast and lactational mastitis takes place.(4) Breastfeeding self-efficacy is the main part for the success of breastfeeding, achieved by the support from the family and from the community. Self-efficacy is the one's beli

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s and motivation

of the person. Successful experience increases mom's self-efficacy leading to better breastfeeding.[5]

Self-efficacy encourages moms to overcome the problems facing breastfeeding, excitement and satisfaction (as positive cases) increases the self-efficacy, while pain, fatigue, anxiety and stress (as negative cases) reduce self-efficacy.[6] The objectives of the current study are to assess the prevalence and risk factors of mastitis in lactating females attending Al-Aslogy family health unit in Sharkia governorate in 6 months from April 2018 to September 2018. Also, to determine breastfeeding self-efficacy for cases of mastitis.

Methods: The protocol of the study was approved by the Institutional review board (IRB) of the Faculty of Medicine, Zagazig University. Patient verbal consent was attained from each participant after explaining the research objectives. The research is a cross sectional study performed in a family health unit in Sharkia governorate from the start of April to the end of September 2018. The target population were women who gave birth to a healthy term singleton infant, attending the family health unit for 4th dose of child vaccine. Exclusion criteria were: 1- Non- lactating females (the baby is formula feed from the start), 2- Delivered a preterm (<37 w) or post-term (>42 w.) or an infant who was transferred to intensive or special care nursery and 3- Mothers were excluded if they were seriously ill.

The Sample size was 196 women calculated by open EPI info version 6, assuming that the total number of lactating females attending to the family health unit in 6 months is 402 women. And the prevalence of lactational mastitis is 20% according to Egbe et al (2016).[4] At confidence level 95%. The attending mothers on the day scheduled for the 4th dose of child vaccination, fulfilling the study criteria were interviewed for: 1- Sociodemographic data for determination of social class based on El-Gilany et al socioeconomic scoring system.

The content of this scale was validated by a jury of experts in this field and its items and domains were tested for reliability by Cronbach alpha ($\alpha = 0.66$) as well as inter and intra-rater reliability and the contribution of each component to the total score was assesses by linear regression model.[7] 2- presence of symptoms of mastitis including: tender, hot, swollen area of the breast, fever of 38.5°C or greater, chills, flu-like aching and systemic illness and 2- and possible risk factors: including: a) General risk factors: returning menstruation after delivery and smoking, b) Breast related factors: History of previous mastitis, nipple cracks, breast congestion,

breast evacuation of milk, lactating duct obstruction, wearing suitable size of breast bra, wearing breast bra during sleep, usage of cream on nipples, milk seep, washing hands before breast feeding, using milk suction and usage of Industrial nipples. 3- Breastfeeding Self-Efficacy-Short Form.[8]

The (BSES-SF) is a 14-item instrument developed to measure breastfeeding confidence. All the items are preceded by the statement ''I can always'' and are anchored by a 5-point Likert-type scale, with 1= not at all confident and 5= always confident. All the items are presented positively and the scores are summed up to produce a final score ranging from 14 to 70, with the higher scores indicating better breastfeeding self-efficacy. The (BSES-SF) score is a reliable and valid measure for assessing self-efficacy in nursing of adolescent mothers with ($\alpha = 0.807$). **[9]**

Data Mangement: The collected data were analyzed by computer using Statistical Package of Social Services version 24 (SPSS), Data were represented in tables, continuous quantitative variables e.g. age were expressed as the mean ± SD & median (range) and categorical qualitative variables were expressed as absolute frequencies (number) & relative frequencies (percentage). Independent t and Chi –square tests were used to test significance were used after checked for normality. The results were considered statistically significant when the significant probability was less than 0.05 ($P < 0.05$). P-value < 0.001 was considered highly statistically significant (HS), and P-value ≥ 0.05 was considered statistically insignificant (NS).

Results: This study examined 196 lactating female, the mean age is 26.93 ±3.78 years old, about half of them have finished their university education (48.9%), despite of that 2/3 of them are not working (64.4%), Three quarters of studied group are residents of urban areas (73.9 %). Most of the studied mothers have low socioeconomic status and middle socioeconomic status (31.1% and 56.10%) respectively (Table1).

About 1/5 of the studied mothers developed mastitis (20.4%) (Table 2). The mean of age among the studied mastitis group is 26.95 ±3.76 years old , with a range from (19-35) years old, while in non-mastitis group it is 27.5± 3.56 years old with a range from (19-35) years old with no statistically significant difference also there is no statistical significant difference regarding socioeconomic level (Table 3).

The study also showed the general risk factors of mastitis; where about 60% of females with mastitis have their menstruation returned after delivery and 64.1 % of females without mastitis with no statistical significant difference. There is statistical significance difference regarding smoking, 2.5% vs zero% in mastitis cases and non-mastitis females respectively (p= 0.047) (Table 4).

For the breast related risk factors of mastitis, ¾ of the studied females have no previous history of mastitis, 75% suffered from nipple cracks, and only (2.5%) suffered from lactating duct obstruction. There is statistical significant difference between mastitis cases and female without mastitis regarding nipple cracks (75% vs. 28.8%), breast congestion (60% vs. 32%), lactating duct obstruction (2.5% vs. 0%), wearing breast bra during sleep (70% vs. 28.2) and using milk suction (42.5% vs. 19.2%) (Table 5).

For the Breastfeeding Self-efficacy of lactating mothers: (21.9%) were always confident to determine that their baby is getting enough milk and 35.7% of them always confident to breastfeed their baby without using formula as a supplement, 39.3% always confident to continue to breastfeed their baby for every feeding, the mean of breast feeding self-efficacy of the studied females to finish feeding their baby on one breast before switching to the other breast is 3.47±1.11 (Table 6). The mean score of Breast-feeding Self-Efficacy Scale is statistically higher with non-mastitis than in mastitis (50.84 ± 8.48 versus 32.77±2.68) respectively (p=0.000) (Table 7).

Discussion: Exclusive breastfeeding is essential for both the infant and the mother; it is affected mainly by the mother's self-efficacy to do the act of breastfeeding and the support she perceives from the family, the physician and the community. The most challenge faced by the mother is lactational mastitis. This study was carried out to assess prevalence of mastitis, risk factors and breastfeeding self-efficacy in women after 6 months from delivery.

The results of this study concluded that: 20.4% of the studied lactating females at the time of the study had mastitis. This is in agreement with another study conducted on 3117 postnatal lactating mothers who had a full term or preterm, vaginal or caesarean delivery at K.V.G medical college and Hospital, Sullia, Karnataka, for a period of six weeks postpartum recorded that the prevalence of mastitis ranges from 2-24%. **(1)** Also consistent with Egbe's study a cross sectional prospective study on Douala general hospital patients (a tertiary care center), on 245 nursing

mothers, the study stated that 15% is the participants had mastitis. [4] Likely with Amir's study, a prospective study in 2014 showed that lactation mastitis ranged from 3-20%.[10]

The mean age of the studied mastitis cases was 26.95 ±3.76 years old, with a range from 19 to 35 years old. There is no statistically significant difference between mastitis cases and other lactating females without mastitis regarding age and socioeconomic level.

This is inconsistent with a previous prospective study in India, on 160 participants, that 55% of mastitis participants are of age (24-30) years old, and that the low socioeconomic status represents 49%.[1]

Another cross-sectional study in Cameroon on 245 participants showed that the increase in age and education is considered risk for lactation mastitis, age of 30-39 years represents 45.7%, and aged 20-29 years represents 40.4%, while teenage represents 7.8% of the participants in the study. [4] Unlike Lawan's study; a study in Kano Metropolis, Kano State, Nigeria on 57 lactating moms, 45 by random sample of 9 respondents in each area selected that showed that there is no specific range for the age for lactation mastitis, and showed that the correlation between breastfeeding problems and education is associated with the belief of insufficient and nonnutritive breast milk as a cultural belief.[11] Another prospective cohort study in New Castle, New South Wale on 1.075 lactating females, showed that increased maternal age is a risk for lactation mastitis, as well as the higher educational level. [12]

Most of mastitis cases have low socioeconomic status and middle socioeconomic status (32.5% and 55.0 %) respectively. This is consistent with Lawan's study that showed that the lower the socioeconomic level, the more the infections and disease and increased in rate of lactation mastitis. [11] About 2/3 of females had their menstruation after delivery 60% and almost all of them are not smokers (97.5%),with no statistical significant difference between mastitis cases and other lactating females regarding returning menses. Regarding smoking 2.5% versus zero% in mastitis cases and non-mastitis females respectively with statistical significance difference (p= 0.047).

Another study by Egbe showed that smoking damages milk ducts causing slow flow of the milk and its stasis, 2 of 245 participants do smoke 2 sticks at least per day. [4] That was against a study by kinaly showing that smoking decreases the risk for lactation mastitis. [12]

In this study it's proved that there is statistical significant difference between mastitis cases and females without mastitis regarding presence of nipple cracks, breast congestion, lactating duct obstruction, wearing breast bra during sleep and using milk suction being more in mastitis group.

This is inconsistence with Kinaly study showed that blocked duct, cracked nipples and usage of cream on nipple are risk for lactation mastitis. **(12)** And Dutta's study that showed that the predisposing factors of lactational mastitis were breast engorgement (75%), anemia (45%), cracked nipple (44%) and poor attachment of baby to the breasts (32%). **(1)** Also 82% of mastitis patients ware suitable sized bra, with significant difference between mastitis and other lactating females. This agrees with another study in (2015) who stated that lactating females wearing tight bra represents 14.7% of females with lactation mastitis, while 85.3% do not. **(4)**

The Breastfeeding Self-efficacy of lactating mothers: 1/5 of them were always confident to determine that their baby is getting enough milk and 35.7% of them always confident to breastfeed their baby without using formula as a supplement, about 40% were always confident to continue to breastfeed their baby for every feeding. The mean of breast feeding self-efficacy of the studied females to finish feeding their baby on one breast before switching to the other breast is 3.47±1.11.This was slightly lower than the results by Nursan a descriptive study conducted between January-April 2011, the study consisted of all the mothers who were living in the center of Sakarya province and had infants ages 0-3 months. The sample consisted of 152 mothers who agreed to participate.

The data were obtained from mothers who came to two family health centers and outpatient clinics of a state hospital. The results stated that (38.8%) were always confident to determine that their baby is getting enough milk and 42.1% of them always confident to breastfeed their baby without using formula as a supplement, 63.8 % always confident to Continue to breastfeed their baby for every feeding, mean of Breast Feeding Self-efficacy of the studied females to finish feeding their baby on one breast before switching to the other breast is 3.87±1.13. **(8)** This study proved that the mean score of Breast-feeding Self-efficacy Scale is statistically higher with non-mastitis than with mastitis (50.84 ± 8.48 versus 32.77±2.68) respectively (p=0.000).

Study limitation: There was a transportation problem to reach the unit and some participants are bored during the interview as the vaccination room is crowded and each mother had to respond to many questions to complete the questionnaires.

Conclusion: Mastitis is one of the problems that face the lactating females, the prevalence was 20% and risk factors that may have contributed to its occurrence in this study with statistically significant difference were cracked nipples, lactating duct obstruction, wearing bra during sleeping and milk suction usage. Breastfeeding self-efficacy of mothers who had mastitis is lower than mothers who are normal with statistically significant difference.

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Table (1): Frequency distribution of sociodemographic characteristics of the studied lactating females (No=196)

Item	Lactating mothers (n=196)	
	No.	%
Age (years)		
▪ Mean ± SD	26.93 ±3.78	
Education		
▪ Illiterate	7	3.6
▪ Primary/Preparatory education	10	5.1
▪ Secondary	60	30.6
▪ Intermediate/institute	16	8.2
▪ University	96	48.9
▪ Post graduate	7	3.6
Occupation		
▪ Non-working /house wife	126	64.4
▪ Semiprofessional / clerk	45	22.9
▪ Professional	25	12.7
Residence		
▪ Slum areas	5	3.6
▪ Rural	46	23.4
▪ Urban	145	73.9
▪ **Socioeconomic level**		
▪ Very low (1 st quartile ≤ 21)	15	7.7
▪ Low (2 nd quartile ≤42)	61	31.1
▪ Middle (3 rd quartile ≤ 63)	110	56.1
▪ High level (4 th quartile ≤84)	10	5.1

Table (2): Prevalence of mastitis cases among the studied lactating females (No=196).

Item	lactating females (N=196)	
	No	%
▪ Mastitis	40	20.4
▪ No lactation mastitis	156	79.6

Table (3): Age and socioeconomic level of the studied lactating females and mastitis cases (No=196).

	Mastitis cases (N=40)		Non- mastitis group (N=156)		Test	P-value
	no	%	no	%		
Age (years)						
▪ Mean ± SD	26.95 ±3.76		27.5± 3.56		*-0.922	0.357
▪ Median (Range)	27 (19-35)		27 (19-35)			
Socioeconomic level						
▪ Very low (1 st quartile ≤ 21)	3	7.5	12	7.7	#0.044	0.997
▪ Low (2 nd quartile ≤42)	13	32.5	48	30.8		
▪ Middle (3 rd quartile ≤ 63)	22	55.0	88	56.4		
▪ High level (4 th quartile ≤84)	2	5.0	8	5.1		

* Independent t test # Chi –square test

P < 0.05 significant P-value > 0.05 (Non –significant)

Table (4): General risk factors during 6 months after recent delivery among the studied lactating females and mastitis cases (No=196).

Item	Mastitis cases (N=40)		Non- mastitis group (N=156)		Test	P-value
	no	%	no	%		
Returning menstruation after delivery						
▪ No	16	40.0	56	35.9	#0.230	0.631
▪ Yes	24	60.0	100	64.1		
Smoking						
▪ Yes	1	2.5	0	0.0	Fisher's	0.047*
▪ No	39	97.5	156	100.0		

*p-value <0.05(significant) # Chi –square test

Table (5): Breast related risk factors of mastitis during 6 months after the recent delivery among the studied lactating females (No=196).

Item	Mastitis cases (N=40)		Non- mastitis group (N=156)		X^2	P-value
	no	%	no	%		
History of previous mastitis						
▪ No	30	75.0	112	71.8	0.163	0.685
▪ Yes	10	25.0	44	28.2		
▪ Nipple cracks	30	75.0	45	28.8	28.7	<0.0001*
▪ Breast congestion	24	60.0	50	32.0	10.58	0.001*
▪ Evacuation of breast milk	20	50.0	96	61.5	1.755	0.185
▪ Lactating duct obstruction	1	2.5	0	0.0	Fisher's	0.047*
▪ Wearing suitable sized bra	33	82.5	145	92.9	Fisher's	0.041*
▪ Wearing breast bra during sleep	28	70.0	44	28.2	23.93	0.000*
▪ Usage of cream on nipples	30	75.0	130	83.3	1.47	0.225
▪ Milk seep	15	37.5	55	35.3	0.068	0.791
▪ Washing hands before breast feeding	29	72.5	112	71.8	0.007	0.929
▪ Using milk suction	17	42.5	30	19.2	9.45	0.002*
▪ Usage of Industrial nipples	11	27.5	35	22.4	0.454	0.500

***p-value <0.05 (significant)**

Table (6): Breastfeeding Self-efficacy of lactating mothers. Breakdown of answers to the Short Form Scale (BSES-SF) (N=196)

Item	Breast-feeding Self-efficacy Scale- Short Form				
	Not at all confident N (%)	Not confident N (%)	somewhat confident N (%)	confident N (%)	always confident N (%)
▪ Determine that my baby is getting enough milk	39(19.9)	55(28.1)	48(24.5)	11(5.6)	43(21.9)
▪ Successfully cope with breastfeeding like I have with other challenging tasks	6(3.1)	29(14.8)	65(33.2)	34(17.3)	62(31.6)
▪ Breastfeed my baby without using formula as a supplement	26(13.3)	40(20.4)	37(18.9)	23(11.7)	70(35.7)
▪ Ensure that my baby is properly latched on for the whole feeding	36(18.4)	55(28.1)	35(17.9)	23(11.7)	47(24.0)
▪ Manage the breastfeeding situation to my satisfaction	4(2.0)	30(15.3)	72(36.7)	32(16.3)	58(29.6)
▪ Manage to breastfeed even if my baby is crying	18(9.2)	22(11.2)	37(18.9)	46(23.5)	73(37.2)
▪ Keep wanting to breastfeed	19(9.7)	62(31.6)	51(26.0)	27(13.8)	37(18.9)
▪ Comfortably breastfeed with my family members present	0(0.0)	45(23.0)	46(23.5)	61(31.1)	44(22.4)
▪ Be satisfied with my breastfeeding experience	21(10.7)	28(14.3)	31(15.8)	58(29.6)	58(29.6)
▪ Deal with the fact that breastfeeding can be time-consuming	29(14.8)	40(20.4)	38(19.4)	11(5.6)	78(39.8)
▪ Finish feeding my baby on one breast before switching to the other breast	0(0.0)	43(21.9)	69(35.2)	32(16.3)	52(26.5)
▪ Continue to breastfeed my baby for every feeding	18(9.2)	30(15.3)	38(19.4)	33(16.8)	77(39.3)
▪ Manage to keep up with my baby's breastfeeding demands	35(17.9)	49(25.0)	42(21.4)	17(8.7)	53(27.0)
▪ Tell when my baby is finished breastfeeding	0(0.0)	36(18.4)	52(26.5)	51(26.0)	57(29.1)

Table (7): Breastfeeding Self-efficacy of lactating mothers in relation to mastitis among the studied lactating females (No=196)

Breastfeeding Self-Efficacy	Mastitis cases (N=40)	Non- mastitis group (N=156)	t -test	p-value
Mean ± SD	32.77±2.68	50.84 ± 8.48	-22.56	0.000* (HS)

Independent t test *P-value <0.05 is significant HS (highly significant)

الملخص العربي

درجه الكفاءه الذاتيه للرضاعه الطبيعيه مع التهابات الثدي المصاحبه للرضاعه: دراسه مستعرضه بوحده صحه الأسره - محافظه الشرقيه- مصر

نورا الشحات عرفه – دعاء عمر رفعت- نورا نبيل حسين

الخلفية: إلتهاب الثدي هو عدوى في نسيج الثدي يحدث بشكل متكرر خلال فترة الرضاعة الطبيعية. حوالي ١% -٣ ٪ من الأمهات المرضعات تصاب بالتهاب الثدي. من الممكن أن يساهم الإحتقان وعدم اكتمال إفراغ الثدي في المشكلة ويجعل الأعراض أسوأ. يمكن أن يحدث التهاب الثدي مع أو بدون وجود العدوى. مع تقدمه ، يمكن أن يتسبب التهاب الثدي في تكوين خراج الثدي. الحالات الشديدة من الالتهاب يمكن أن تكون قاتلة إذا تركت دون علاج. **الأهداف**: تقييم انتشار وعوامل الخطر من التهاب الثدي في الإناث المرضعات والفعاليه الذاتيه للرضاعة الطبيعية لحالات التهاب الثدي والأمهات المرضعات الطبيعيات. **المنهجية و طرق البحث** : دراسة مقطعية مستعرضة في وحدة صحة الأسرة بمحافظة الشرقية حول النساء اللاتي ولدن طفلًا طبيعيا ،و يحضرن لوحدة صحة الأسرة للجرعة الرابعة من لقاح الأطفال. أجريت مقابلة لحدوث التهاب الثدي وعوامل الخطر والفعاليه الذاتيه للرضاعة. **النتائج**: ٢٠ ٪ من الإناث المرضعات المدروسة اصبن بالتهاب الثدي. ٤\٣ من حالات التهاب الثدي ليس لديهم تاريخ سابق للالتهاب (٧٥٪) ، ٪ عانوا من تشققات الحلمة و ٧٠ ٪ يرتدون الصدرية أثناء النوم. متوسط درجات مقياس الفعاليه الذاتية للتغذية الثديية هو أعلى إحصائيا مع الامهات الطبيعيات عنه في التهاب الثدي (٥٠,٨٤ ±٨,٤٨) مقابل (٣٢٫٧٧ ± ٢,٦٨) على التوالي .**الخلاصة:** هناك فروق ذات دلالة إحصائية بين حالات التهاب الثدي والإناث دون التهاب فيما يتعلق بشقوق الحلمة واحتقان الثدي ، انسداد القناة المرضعة ، وارتداء الصديريه أثناء النوم واستخدام شفاط الحليب. درجة الفعاليه الذاتيه للرضاعة الطبيعية أعلى مع عدم الإصابة بالتهاب الثدي من حالات التهاب الثدي.