



# Experience and knowledge level of female health care professionals in Samsun province regarding puerperal mastitis

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## ABSTRACT

**Objective:** Inappropriate or insufficient knowledge of health care professionals about puerperal mastitis can lead mothers to premature weaning, as well as the lack of education on proper breastfeeding. However, the importance of education regarding puerperal mastitis seems to be underestimated.

**Material and Methods:** From July to August 2014, 317 female health care professionals were surveyed in Samsun, Turkey. Participants were classified into three groups; nurses, maternity care nurses (obstetrics and gynecology nurses and pediatrics clinic nurses), and midwives. A specifically prepared questionnaire was used to collect data.

**Results:** 69.1% (n=219) of female health care professionals had one or more child/ren. The median length of breastfeeding duration was 11 months (0-36) while the overall puerperal mastitis rate was 13.3% (n=29). Puerperal mastitis related cessation of breastfeeding was similar between the groups, with an overall rate of 3.1%. 61.1% of the participants stated that they had one or more hours of education regarding puerperal mastitis while 5.4% indicated that they learned about the pathology from their experiences. Midwives and maternity care nurses were found to be more knowledgeable than nurses regarding the reasons, risk factors, prevention, symptoms, and treatment of puerperal mastitis.

**Conclusion:** As a result, the current level of education regarding breastfeeding and puerperal mastitis and daily practice in female health care professionals in Turkey is far from desired levels. The breastfeeding education of health care professionals must be adapted to an effective program, such as UNICEF/WHO 20-hour breastfeeding training course, and puerperal mastitis should be accepted as a public health care issue.

**Keywords:** Breastfeeding health, education, health care professional, knowledge, puerperal mastitis

## INTRODUCTION

Mastitis is an inflammatory condition of the breast, which may or may not be accompanied by infection and is usually associated with lactation (1). As it commonly occurs in lactating women, it is called lactational or puerperal mastitis, with a reported incidence varying from 2.9% to 33% of lactating women, mainly because of the absence of a reliable diagnostic test (2-5). It has been shown that only acute cases with local and systemic symptoms are being reported while subacute cases are systematically under-reported (6).

Mainly, two conditions cause mastitis, milk stasis and infection (7). Stagnation of milk is caused by inappropriate breastfeeding attitudes including mother-infant positioning and attachment problems by the infants (8-10). With early recognition of the condition, the overall success rate of treatment can be as high as 96% in puerperal mastitis (11). After the initiation of antibiotic therapy and proper breast emptying, inflammatory symptoms of the affected breast are improved within two weeks (12). Delayed diagnosis or treatment may result in recurrent mastitis, breast abscess, and even mortality, in some circumstances (13).

In addition to the positive correlation between proper breastfeeding attitudes and prevention of mastitis, it has been shown that puerperal mastitis is the third most common reason for premature weaning (14). Nearly one in four breastfeeding women indicated mastitis as the reason for premature weaning due to pain and discomfort (15). In addition, it was shown that a mother's education about proper breastfeeding attitudes during the first days of delivery and practices in the hospital could significantly influence future breastfeeding success and decrease postpartum problems (16, 17). So far, researchers have mostly focused on breastfeeding education (18-23). However, the importance of knowledge regarding puerperal mastitis is underestimated.

The present status of the knowledge level on puerperal mastitis in Turkey is unknown. In this descriptive survey, we aimed to evaluate the current experience and knowledge level of a group of female health care professionals in Samsun regarding puerperal mastitis.

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Table 1. The descriptive questionnaire on puerperal mastitis and interpretation of the answers

1) What is the definition of mastitis? a) The inflammation of breast tissue b) The inflammation or infection of breast tissue c) I don't know	a or c; lack of knowledge about the definition of mastitis b; sufficient knowledge about the definition of mastitis
2) What is the reason/s of puerperal mastitis? a) There are no well-known reasons b) Milk stasis in the breast c) Cracked nipple d) Poor breastfeeding behavior e) I don't know	a or e; lack of knowledge about the reason of puerperal mastitis b, c, d; 2 of the 3 were accepted as sufficient knowledge about the reasons of puerperal mastitis
3) Are there risk factors for the development of puerperal mastitis? a) No b) Mastitis in previous lactation/s c) Cracked nipple d) Cream on nipples e) Poor breastfeeding behavior f) Oral antibiotics during breastfeeding g) I don't know	a or g; lack of knowledge about the risk factors of puerperal mastitis b, c, d, e, f; 3 of the 5 were accepted as sufficient knowledge about the risk factors of puerperal mastitis
4) Is the development of puerperal mastitis preventable? a) No b) Yes, with good breastfeeding habits c) Yes, with avoiding cracked nipple d) I don't know	a or d; lack of knowledge about the prevention of puerperal mastitis b or c; was accepted as moderate knowledge about the prevention of puerperal mastitis b and c; were accepted as sufficient knowledge about the prevention of puerperal mastitis
5) What are the symptoms of puerperal mastitis? a) Tenderness of the breast b) Breast pain c) Redness of the breast d) Breast lump e) Fever f) Flu-like symptoms (hot sweats or aches) g) It has no specific symptom h) The diagnosis can be only made with sonography i) I don't know	g or h or i; lack of knowledge about the symptoms of puerperal mastitis a, b, c, d; (2 of 4) and e, f; (1 of 2) were accepted as sufficient knowledge about the symptoms of puerperal mastitis
6) Is there any treatment for puerperal mastitis? a) No b) Removal of milk with pump c) Antibiotics d) Removal of milk with pump and antibiotics e) Probiotics f) I don't know	a or f; lack of knowledge about the treatment of puerperal mastitis b, c, d, e; 2 of the 4 were accepted as sufficient knowledge about the treatment of puerperal mastitis
7) Did you ever get an education on puerperal mastitis? a) Received, while I was studying b) Received, while I was working c) I did not d) I have informal knowledge e) I have learned from my own mastitis experience during previous lactation/s	a or b; were accepted as educated about puerperal mastitis c or d; lack of education about puerperal mastitis e; education from personal experiences

## MATERIAL AND METHODS

### Participants

The study was approved by Ondokuz Mayıs University Ethics Committee and informed consents were obtained from all participants. Over a 4-week period from July to August 2014, female health care professionals were surveyed at one university hospital, one education and research hospital, and five local state hospitals (100 or more bed capacity) in Samsun, Turkey. Following a short overview, 317 of the 550 female health care professionals accepted to participate in the survey (response rate was 57.6%).

Participants were classified into three groups; nurses, maternity care nurses (obstetrics and gynecology nurses and pediatrics clinic nurses), and midwives. A specifically prepared questionnaire was used to collect data.

### Survey Item

The survey consisted of questions related to the demographic characteristics of the participants, history of previous birth/s, previous breastfeeding attitudes, mastitis or breast abscess experience, and the reason for cessation of breastfeeding. In addition, education on breastfeeding during previous birth/s, training on mastitis during their training or employment, and their knowledge regarding the definition, reasons, risk factors, symptoms, prevention methods and treatment of puerperal mastitis were addressed.

As there is no standard definition, the presence of at least two symptoms including pain, hyperemia and lump along with at least one symptom including fever or flu-like symptoms was accepted as puerperal mastitis (23). When a participant an-

swered "yes" to the experience of self- puerperal mastitis, she was questioned about her symptoms and the final answer was revised (if required) according to the aforementioned definition criteria of puerperal mastitis.

A participant who has taken one hour or more education about puerperal mastitis during their training or employment period was accepted as educated.

### Statistical Analysis

Continuous data were presented as mean±standard deviation (SD) or median and range. Dichotomous and categorical data were presented as numbers with percentages. Normally distributed continuous data were assessed with one-way ANOVA test. If the data were not normally distributed, continuous data were evaluated with Kruskal-Wallis test. The Chi-square test and Fisher's exact tests were used to compare categorical variables. A two-tailed p-value <0.05 was considered to be statistically significant. Statistical analyses were performed with the Statistical Package for the Social Sciences, version 16.00 (SPSS Inc.; Chicago, IL, USA).

## RESULTS

The mean age of the study group was 32.7±6.8 (18-51). Of the participants; 241 (76%) were nurses, 38 (12%) maternity care nurses, and 38 (12%) were midwives. The descriptive questionnaire about puerperal mastitis and interpretation of the answers are presented in Table 1.

69.1% (219) of female health care professionals had one or more child/ren. The median length of breastfeeding duration was 11 months (0-36) while the overall puerperal mastitis rate was 13.3% (n=29). In the presence of puerperal mastitis, milk

Table 2. Experience about breastfeeding and mastitis in the participants with children

	Nurses (n=158)	Maternity care nurses (n=31)	Midwives (n=30)	Total (n=219)	p
Number of children (median and range)	1 (1-4)	2 (1-4)	2 (1-3)	2 (1-4)	0.915
The length of breastfeeding education (min) (median and range)	12.5 (0-180)	30 (0-60)	60 (60-120)	15 (0-180)	0.001
Maximum breastfeeding period (month) (median and range)	11 (0-36)	6 (2-36)	11.5 (2-24)	11 (0-36)	0.732
Mastitis, n (%)	22 (14)	2 (6.5)	5 (16.7)	29 (13.3)	0.207
Breast abscess, n (%)	9 (5.7)	1 (3.2)	1 (3.3)	11 (5)	0.999
<b>Mastitis treatment, n (%)</b>					
Removal of milk	10 (45.6)	-	2 (40)	12 (41.6)	0.002
Antibiotics	5 (22.7)	-	-	5 (17.2)	
Removal of milk and antibiotics	5 (22.7)	2 (100)	3 (60)	10 (34.4)	
Probiotics and others	2 (9)	-	-	2 (6.8)	
Post-mastitis breastfeeding period (month) (median and range)	1 (0-10)	-	2 (0-8)	1 (0-10)	0.203
<b>The reason for cessation of breastfeeding, n (%)</b>					
No breastfeeding	6 (4)	-	-	6 (2.9)	0.214
Voluntarily or beginning to work	101 (63.9)	23 (74.2)	21 (70)	145 (66.2)	
Insufficient milk or nipple problems	48 (30.3)	6 (19.3)	7 (23.3)	61 (27.8)	
Mastitis related	3 (1.8)	2 (6.5)	2 (6.7)	7 (3.1)	

emptying and antibiotics treatments were used at a higher proportion of maternity care nurses and midwives as compared to nurses ( $p=0.002$ ). Puerperal mastitis related cessation of breastfeeding was similar between the groups, with an overall rate of 3.1%. Experience with breastfeeding and mastitis in the participants with child/ren are presented in Table 2.

143 (59.6%) of nurses, 27 (73%) of maternity care nurses, and 24 (64.9%) of midwives stated that they have taken one hour or more education regarding puerperal mastitis ( $p=0.426$ ), with an overall rate of 61.1% ( $n=194$ ). Only 5.4% ( $n=17$ ) of the participants stated that they obtained knowledge regarding puerperal mastitis from their experiences.

Midwives and maternity care nurses were found to be more knowledgeable than nurses regarding the reasons, risk factors, prevention methods, symptoms, and treatment of puerperal mastitis. Having a child increased the knowledge level on the cause of puerperal mastitis in nurses and midwives ( $p<0.001$ ,  $p=0.024$ ), and increased the knowledge level in the treatment of puerperal mastitis in nurses ( $p<0.001$ ). Knowledge levels regarding puerperal mastitis according to groups are presented in Table 3.

## DISCUSSION

The consequences of avoiding breastfeeding for mothers and babies have led many governments to develop supportive health care policies (24, 25). In addition to these efforts, increasing awareness on the importance of proper breastfeeding education in the early post-delivery period as well as continued

communication with a health care professional is essential to prevent breastfeeding-related problems (26). However, inappropriate or insufficient knowledge of health care professionals about the definition, prevention methods, and treatment of puerperal mastitis can lead mothers to premature weaning, as well as the lack of education on proper breastfeeding (27). Education regarding puerperal mastitis seems to be underestimated. In this descriptive survey, we aimed to uncover the knowledge level regarding puerperal mastitis among a group of female health care professionals.

It was stated that education on proper breastfeeding decreases the rate of puerperal mastitis (16, 17). The UNICEF/WHO 20-hour breastfeeding training course was reported to significantly improve management of mastitis among health care professionals (18). In our study, the length of post-delivery breastfeeding education time in the participants was found to be far below the desired levels with just about 15 minutes. de Oliveira et al. (19) have shown that a 30-minute counseling session on breastfeeding techniques in the maternity ward was not sufficient to reduce the incidence of mastitis during the first month.

The incidence of puerperal mastitis was reported as 2.9-33% in the literature (2-5). However, the actual incidence of puerperal mastitis in Turkey is unknown. A recent study (28) reported the puerperal mastitis rate as 9.2% while another study (29) with a broad definition of breast problems stated that 71.4% of the study group had postpartum breast problems (breast engorgement, tenderness, and pain). In the present study, we

Table 3. Knowledge levels regarding puerperal mastitis according to groups

Knowledge about, n (%)	Nurses (n=241)			Maternity care nurses (n=38)			Midwives (n=38)			Total (n=317) Overall p
	With child/ren (n=158)	Without child/ren (n=83)	p	With child/ren (n=31)	Without child/ren (n=7)	p	With child/ren (n=30)	Without child/ren (n=8)	p	
<b>Definition of mastitis</b>										
Sufficient	136 (86.1)	73 (88)	0.683	26 (83.9)	4 (57.2)	0.117	26 (86.6)	6 (75)	0.587	0.437
Insufficient	22 (13.9)	10 (12)		5 (16.1)	3 (42.8)		4 (13.4)	2 (25)		
<b>Reason of mastitis</b>										
Sufficient	74 (46.8)	19 (22.9)	<0.001	24 (77.5)	3 (42.8)	0.161	26 (86.6)	4 (50)	0.024	<0.001
Insufficient	84 (53.2)	64 (77.1)		7 (22.5)	4 (57.2)		4 (13.4)	4 (50)		
<b>Mastitis risk factors</b>										
Sufficient	56 (35.4)	22 (26.5)	0.159	16 (51.6)	3 (42.8)	0.999	24 (80)	4 (50)	0.087	<0.001
Insufficient	102 (64.6)	61 (73.5)		15 (48.4)	4 (57.2)		6 (20)	4 (50)		
<b>Prevention of mastitis</b>										
Sufficient or moderate	134 (84.9)	71 (85.5)	0.124	30 (96.8)	7 (100)	0.712	28 (93.3)	7 (87.5)	0.196	0.001
Insufficient	24 (15.1)	12 (14.5)		1 (3.2)	-		2 (6.7)	1 (12.5)		
<b>Symptoms of mastitis</b>										
Sufficient	129 (81.6)	60 (72.3)	0.093	31 (100)	7 (100)	0.999	30 (100)	7 (87.5)	0.211	<0.001
Insufficient	29 (18.4)	23 (27.7)		-	-		-	1 (12.5)		
<b>Treatment of mastitis</b>										
Sufficient	87 (55.1)	26 (31.3)	<0.001	20 (64.5)	4 (57.2)	0.999	27 (90)	6 (75)	0.363	<0.001
Insufficient	71 (44.9)	57 (68.7)		11 (35.5)	3 (42.8)		3 (30)	2 (25)		

found the puerperal mastitis rate in 219 female health care professionals as 13.3%, with a 5% rate of breast abscess. Although there is no data on the frequency of breast abscess in Turkey, the rates detected in our study was similar to the previously reported rates of 3-11% (30).

Habibe Şahin et al. (28) demonstrated that the mean of maximum breastfeeding duration was  $17.7 \pm 8.0$  months in mothers who presented to public health care centers in Kayseri, Turkey. In the present study, the median of maximum breastfeeding period was found to be 11 months (0-36) among female health care professionals. It seems that health care professionals are breastfeeding for shorter periods and they experience puerperal mastitis more frequently. This difference may be associated with the socio-cultural environment of study groups as well as insufficient education of health care professionals in our study. In addition, the requirements for and the need to early return to work may have affected proper breastfeeding attitudes in health care professionals. In our study, the main reasons for cessation of breastfeeding were voluntary discontinuance and beginning to work (68.1%), which were similar between the groups. The overall puerperal mastitis related cessation rate was determined as 3.1% that is consistent with previously published series (23).

As we have no data on the sufficient time for puerperal mastitis-specific education, we have accepted one-hour as a cut-off. 194 (61.1%) of the female health care professionals stated that they had approximately one hour or more education on puerperal mastitis. Although, the education time was similar between the groups, recommended treatment of breast emptying and antibiotics usage was significantly higher in maternity care nurses and midwives, thus it may reflect the importance of experience rather than education.

In all knowledge level measurement questions, except the definition of puerperal mastitis, midwives, and maternity care nurses were more knowledgeable than the nurses. However, the recommended treatment was significantly different only in participants with an experience of puerperal mastitis.

### Study Limitations

This study has some limitations. Although the total number of participants seems to be adequate, the distribution was not homogeneous. Additionally, some features of study participants may affect the results; 1) the relatively small sample size of maternity care nurses and midwives, 2) the differences in college training and current working status among participants. Most of our participants have one or more child/ren. Although only a small percentage of female health care professionals reported obtaining knowledge on puerperal mastitis from their experiences, we must note that the discrimination between education and experience related knowledge is difficult. To assess this issue independently, choosing the study population from recently graduated female health care professionals without children may be beneficial.

### CONCLUSION

The results of our study imply that the current level of education regarding breastfeeding and puerperal mastitis, and the daily practice among female health care professionals in Turkey are far from the desired levels. In addition, the similarity in mastitis rates among housewives and health care profession-

als is noteworthy. It seems that socio-cultural environment may be an important factor. The breastfeeding education of health care professionals must be adapted to an effective program, such as the UNICEF/WHO 20-hour breastfeeding training course, and puerperal mastitis should be accepted as a public health care issue.

**Ethics Committee Approval:** Ethics committee approval was obtained for this study from the ethics committee of Ondokuz Mayıs University.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

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