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ORIGINAL ARTICLE

Mastalgia and associated factors: a cross-sectional study

Mastalji ve ilişkili faktörler – kesitsel bir çalışma

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Summary

Objectives: Mastalgia is a common and painful experience among women. This study aimed to determine the prevalence of breast pain, characteristics of the pain, and factors associated with breast pain, particularly those that can be changed.

Methods: This cross-sectional study comprised women aged from 18 to 65 years. In total, 752 women were included. Risk factors for breast pain were determined using logistic regression analysis with the entry model, and the risk factors for periodic and non-periodic breast pain were assessed using logistic regression analysis with the backward model.

Results: Results revealed that the following were significant risk factors: age between 35 and 50 years (OR, 1.614; CI, 1110–2347), university graduate (OR, 3.207; CI, 1.874–5.490), BMI of >30 (OR, 2.068; CI, 1.163–3.674), excessive use of salt (OR, 1,687; CI, 1.075–2 .647), weight gain in the last 5 years (OR, 1.411; CI, 1018–1955), use of a small bra (OR, 3.260; CI, 2204–4821), and use of a large bra (OR, 1.896; CI, 1276–2817).

Conclusion: Weight control, restriction of salt intake, and selection of a suitable brassiere are important for preventing and managing mastalgia.

Keywords: Breast pain; mastalgia; risk factor.

Özet

Amaç: Mastalji kadınlar arasında yaygın görülen ağrılı bir deneyimdir. Bu çalışmanın amacı mastaljinin prevelansı, ağrının özellikleri ve mastalji ile ilişkili olan özellikle değiştirilebilir faktörlerin belirlenmesidir.

Gereç ve Yöntem: Kesitsel bir çalışmadır, çalışma grubunu 18–65 yaş arası kadınlar oluşturmaktadır. Toplamda çalışma 752 kadın çalışmada yer almıştır. Meme ağrısı için risk faktörleri logistik regresyon-enter modeli; periyodik ve periyodik olmayan meme ağrısı için risk faktörleri logistik regresyon-backward metodu ile değerlendirilmiştir.

Bulgular: Meme ağrısı yaşama için risk faktörleri 35–50 yaş arasında olma (OR: 1.614 CI: 1.110–2.347), üniversite mezunu olma (OR: 3.207 CI:1.874–5.490), BKİ 30'un üzerinde olması (OR: 2.068 CI:1.163–3.674), aşırı tuz kullanımı (OR: 1.687 CI:1.075–2.647), son beş yılda kilo alımı (OR: 1.411 CI: 1.018–1.955), bedeninden küçük sütyen kullanma (OR: 3.260 CI: 2.204–4.821), bedeninden büyük sütyen kullanmadır (OR: 1.896 CI: 1.276–2.817).

Sonuç: Mastaljinin önlenmesi ve yönetiminde kilo kontrolü, tuz alımının kısıtlanması ve uygun önemlidir.

Anahtar sözcükler: Meme ağrısı; mastalji; risk faktörü.

Introduction

Mastalgia (breast pain) is a common and painful experience among women, adversely affecting daily life by reducing the quality of life and yielding to anxiety with concerns.[1–5] Due to these significant consequences, there is great interest in mastalgia. Articles on this subject are mostly focused on the prevalence, characteristics, etiology, and treatment of mastalgia. Mastalgia can be categorized into four types as cyclic, non-cyclic, chest wall pain, and non-chest wall pain.[4] The prevalence, etiology, and treatment characteristics can vary within those groups. Specifically cyclic and non-cyclic types are dominant in the literature. Mastalgia prevalence is reported as high as 50 to 70% among women and in particular, pain accompanies the menstrual cycle.[2,4,6,7] Non-cyclic mastalgia, on the other hand, is seen at a lower rate, yet still significantly affects women's lives.[3,4] The incidence of mastalgia increases among women over 30 years old.[1,4,7] Women experiencing mastalgia pain usually

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score it as moderate, and the rate of those who report a severe pain score is lower.[2,3] Experiencing severe pain can disrupt the daily life of women, which results in seeking medical attention; the severity of pain experienced by women is reported to be similar to chronic cancer, or arthritis pain.[4,8,9] Breast pain can affect daily life, including sexuality, sleeping, or physical, social and work-school life.[2,3,10] Although there are studies that explain the reasons for mastalgia, the etiology is not clearly defined. Etiologic factors are defined from a variety of areas including hormonal factors, life habits, and stress. While it is mentioned that changes causing an imbalance in the ratio between estrogen and progesterone can result in pain in women with benign mastopathies,[8] there are other factors that can be related to mastalgia such as smoking, caffeine consumption,[6,7] obesity, alcohol intake 7, pregnancy, mastitis, trauma, macrocytes, and benign tumors.[9,11] In some studies, bra pressure and exercise were listed among the reasons that could yield pain.[11,12] Although there is a focus on the psychogenic properties of mastalgia, it is still controversial whether women prone to anxiety and depression experience more breast pain or experienced breast pain affect the mental health of women.[6,13] Some of the mastalgias originate from different sources other than the breast, such as chest wall syndromes like costochondritis and Tietze syndrome.[11]

Changes in lifestyle, such as decreasing coffee consumption, vitamin intake, and wearing supportive bras are treatment options for mastalgia.[14,15] Pharmacological treatments including non-steroidal anti-inflammatory drugs[16] and tamoxifen can also be used.[11,17] Surgical intervention may be necessary in cases that are resistant to medical treatment. Davies et al.[18] specifically indicated that resistant cases that require surgical intervention are rare and those patients should be warned and informed about possible complications and unsatisfactory results.

In addition to the aforementioned information in the literature, mastalgia still affect most women by increasing their demand for health services and as a problem affecting the sexual, physical, social and school-work life of women. Controlling mastalgia is an important subject for health workers. The effectiveness of health workers in managing or preventing mastalgia is related to defining its sources. In particular, causal factors related to lifestyle and changes in health habits must be defined. In addition to these factors, many other points of consideration, such as feel of pain, and describing and coping with the pain may arise differently in different cultures.[19] Therefore, there is a need for the redefinition of the characteristics of breast pain in different cultures.

This study aimed to determine the prevalence of breast pain in Turkey, characteristics of the pain and the factors associated with the breast pain, especially those that can be changed.

Material and Methods

Participants

This cross-sectional study was conducted to identify the prevalence of mastalgia and risk factors associated with mastalgia in women between 18–65 years of age. The research data were collected in Konya from May 1 to June 15, 2013. Tables published by the WHO were used to determine the sample size of the study. A 50% prevalence of mastalgia was assumed, and to estimate the real value of this ratio in 0.03 points with 90% confidence, the required sample size was found to be 752.[20] It is stated that in order to determine risk factor by logistic regression analysis the required sample size should be between 20–60 people for each variable.[32] In this study seventeen independent variables evaluated as a risk factor were studied. In this study there were located 44 people for each variable according to determined number of samples. Thus the sample size determined for research was considered to be sufficient for evaluations of prevalence and risk factors. There are 76 Family Health Centers in Konya city center. The study was conducted at seven randomly selected family health centers. Data collection began from the closest house to each center. Data collection work continued by skipping 10 houses each time on the row after the first, with women between the ages of 18–65 years, and stopped when the requisite number was reached. 110 women were included in the research for each of the first six family health centers, while the last center provided 92 women.

Instruments

The data were collected through a questionnaire prepared by the researchers for this study. The ques-

Table 1. Descriptive characteristics of mastalgia

	n	%
Experience of breast pain (n=752)		
No	311	41.4
Yes	441	58.6
Types of mastalgia (n=441)		
Periodic breast pain	326	73.9
Non periodic breast pain	115	26.1
The severity and nature of breast pain (n=441) (x±SD)	4.54	±2.1
The effect of mastalgia on daily life (n=441)		
Not or slightly affected	329	74.6
Affected and significantly affected	112	25.4
The effect of mastalgia on sleep (n=441)		
Not or slightly affected	309	70.1
Affected and significantly affected	132	29.9
The effect of mastalgia on sexuality life (n=441)		
Not or slightly affected	340	77.1
Affected and significantly affected	111	22.9
Pain feature (n=441)		
Tingling	255	57.8
Heavy	143	32.4
Throbbing	46	10.4
Stinging	44	10.0
Stabbing	33	7.5
Numbing	22	5.0
Cramping	14	3.2
Crushing	15	3.4
Burning	12	2.7
Tugging	10	2.3
Consulting a doctor for breast pain (n=441)		
Yes	130	29.5
No	311	70.5
Status of follow-ups. (n=441)		
Yes	41	9.3
No	400	90.7
Types of examination		
Clinical breast examination	67	51.5
A breast ultrasound	56	43.1
Mammography	26	20.0
Others (a biopsy - pathology samples)	19	14.6
Diagnosis (n=130)		
Normal	47	36.2
Benign	73	56.2
Malign	3	2.3
Others (infection)	7	5.4
Suggestion of visiting doctor regularly (n=130)		
Yes	100	76.9
No	30	23.1

tionnaire included five categories: socio-demographic characteristics (a), experiencing mastalgia (b), characteristics of mastalgia and its impact on life (c), attitude toward obtaining medical assistance for the mastalgia (d), and the risk factors associated with mastalgia (e).

Socio-demographic characteristics: Age, education, marital status, and occupation.

Experience of mastalgia: Swelling and tenderness during or immediately prior to menstrual period and breast tissue pain / swelling and tenderness in the time outside of the menstrual period.

Mastalgia characteristics and its impact on life: The severity and nature of breast pain (aching, throbbing, etc…) and how this pain affects daily life, sleep patterns, and sexuality.

Mastalgia severity and effect on daily life, sleep patterns, and sexuality were evaluated with the aid of a scale graded from 0 to 10. The intensity of pain was determined to be very severe at 10 and none at 0. In daily life, sleep patterns and influence on sexuality, 0 was stated for no effect and 10 for significant effect.

Scored 0–2: not affected
Scored 3–5: slightly affected
Scored 6–8: affected
Scored 9–10: significantly affected

Attitude toward obtaining medical assistance for breast pain: Regular breast health check-ups, consulting a doctor for mastalgia, examinations, diagnosis, and status of follow-ups.

Risk factors: Factors such as Body Mass Index (BMI), childbearing status, age of first birth, tea/coffee consumption, smoking /alcohol consumption, salt intake, weight gain in the last five years, wearing an appropriate bra, frequency of the use and the age of onset of wearing a bra were evaluated.

Prior to the start of the study, a pre-application of the questionnaire was conducted on 10 women. With that pre-application, the duration of data collection process, clarity of the questions in data collection tools, and the sufficiency of the data collected for desired re-

Table 2. Risk Factors of Mastalgia From Logistic Regression Model – Enter Method (n=752)

	B	Odds ratio	(95% CI)	p
Constant	-1.465	0.235		**0.000**
Being between the ages of 35 to 50	0.479	1.614	1.110–2.347	**0.012**
Being a university graduate	10.165	3.207	1.874–5.490	**0.000**
Employment status (Yes)	0.122	1.130	0.678–1.883	0.639
Having a BMI over 30	0.726	2.068	1.163–3.674	**0.013**
Childbearing status (No)	-0.061	0.941	0.559–1.584	0.818
First childbirth age (over 30)	-0.646	0.524	0.133–2.060	0.355
Use of birth control pills	0.121	1.129	0.792–1.609	0.503
Tea consumption (Yes)	0.361	1.434	0.936–2.198	0.098
Coffee consumption (Yes)	0.086	1.090	0.736–1.614	0.666
Smoking	0.318	1.375	0.789–2.394	0.261
Alcol consumption (Yes)	0.697	2.008	0.521–7.744	0.311
Excessive use of salt	0.523	1.687	1.075–2.647	**0.023**
Weight gain in the last five years	0.344	1.411	1.018–1.955	**0.039**
Use of small bras	10.182	3.260	2.204–4.821	**0.000**
Use of large bras	0.640	1.896	1.276–2.817	**0.002**
Continuous use of bra throughout the day	-0.144	0.866	0.616–1.218	0.409
The age of onset of wearing a bra (16 years and over)	0.070	1.073	0.758–1.518	0.692

BMI: Body Mass Index.

sults were evaluated and the final version was created.

Procedure

In order to carry out the study, permission was obtained from the ethics committee of Selcuk University, Faculty of Health Sciences. The necessary explanation and information was provided to the women involved in study prior to their participation to obtain their consent which was written and signed.. The data were collected through the questionnaire method and the data were obtained on the basis of individual self-reports and some measurements.

Statistics

The data were summarized as number, percentage mean and standard deviation. In the evaluation of data, logistic regression analysis was utilized. While logistic regression analysis was using, model-data compliance and multicollinearity problems were evaluated. The validity of the obtained models are tested with Hosmer Lemeshow test. Consequently, It was determined that this model is valid and multicolllinearity wasn't a problem. Risk factors for mastalgia were determined with the logistic regression-entry model; and the risk factors for periodic and non-periodic mastalgia were assessed with the logistic regression – backward model. For the backward model, inclusion criteria for the analysis was accepted as 0.01 and exclusion criteria as 0.05. Independent variables were included in the analysis with the following encodings:

- Age: 30–50 years (1), 18–29 years (0), 51–65 years (0)
- Educational status: university graduates (1), elementary or a high school graduate (0)
- Occupation: yes (1), no (0)
- BMI: over 30 (1), below 29 (0)

Body mass index (BMI) was calculated as weight (kg)/height (m^2). BMI was based on self-reported height and weight. Obesity was defined as a BMI >30 kg/m^2.

- Childbearing: yes (0), no (1)
- First childbirth: age over 30 (1), under the age of 30 (0)
- Tea and coffee consumption, and tobacco and alcohol use: yes (1) no (0)
- Use of birth control pills: yes (1), no (0)
- Excessive use of salt: yes (1), no (0)

Table 3. Risk Factors of Periodic Mastalgia From Logistic Regression Model – Backward Method (n=752)

	B	Odds ratio	(95% CI)	p
Constant	-1.507	0.222		**0.000**
Being a university graduate	0.779	2.179	(1.558–3.047)	**0.000**
Having a BMI over 30	0.649	1.914	(1.180–3.104)	**0.008**
Excessive use of salt	0.666	1.947	(1.281–2.958)	**0.002**
Weight gain in the last five years	0.377	1.458	(1.068–1.991)	**0.018**
Use of small bras	1.064	2.897	(1.978–4.244)	**0.000**
Use of large bras	0.628	1.874	(1.263–2.783)	**0.002**

BMI: Body Mass Index.

Table 4. Risk Factors of Non- Periodic Mastalgia From Logistic Regression Model – Backward Method (n=752)

	B	Odds ratio	(95% CI)	p
Constant	-2.213	0.109		**0.000**
Being a university graduate	0.583	1.792	(1.165–2.756)	**0.008**
The age of onset of wearing a bra (16 years and over)	0.733	2.081	(1.367–3.170)	**0.001**

- Weight gain in the last five years: yes (1), no (0)

A gain of three or more kilograms over the last five years was accepted as "yes".

- Wearing a bra that is appropriate for the body: yes (0) used smaller (1), used larger (2)

The women were measured to determine whether or not they wore appropriate size bra for their body. First, the chest circumference under the breasts was measured to determine bra size. Second measurement was made from the nipples to base for the size of the cup. The difference between two measurements was calculated and the following cup sizes were accepted: a difference less than 6.5 cm was "A"; a difference between 6.5 to 13 cm was "B"; between 13 to 19.5 cm was "C"; and greater than 19.5 cm was "D". Data obtained from the bras that the women wore, and the values obtained from measurements were compared with the size of the cup and body to evaluate whether the woman wore an appropriate, too small or too large of bra.[30]

- Continuous use of bra throughout the day: yes (1), no (0)
- The age of onset of wearing a bra: under the age of 16 years (0), 16 years and over (1)

Results

While the prevelance of breast pain was 58.6% among women participating in the study (n=441), 73.9% (43.3% of the study group) of the women with breast pain suffered from periodic breast pain (n=326), and 26.1% (15.3% of the study group) of them suffered from non-periodic breast pain. Women who experienced the pain stated their level of pain as 4.54±2.1 and 25.4% reported that their daily life was affected, 29.9% reported that it affected their level of sleep, and 22.9% reported that their sexual life was impacted. Of the women, 57.8% described their experience of pain as stinging, 32.4% described a feeling of weight, 10.4% described a pulsating feeling, and 10.0% described a jabbing sensation. Among women with breast pain, 29.5% (n=130) consulted a doctor; 51.5% of these women had a clinical breast examination, 43.1% received a breast ultrasound, 20.0% received a mammography, 7.7% received a biopsy, and pathology samples were taken from 6.9% of the women. After the examination, 36.2% of women were diagnosed as normal, a benign mass was detected in 56.2% of women, and evidence of a malignant mass was found in only three women. Follow-up was proposed for 76.5% of the women. The rate of women with chronic breast pain who visit doctor regularly was 9.3%.

When the risk factors are evaluated for experiencing breast pain; being between the ages of 35 to 50 increases the risk of experiencing breast pain 1.614 times (CI: 1110–2347), being a university graduate 3.207 times (CI: 1.874–5.490), having a BMI over 30 2,068 times (CI: 1.163–3.674), excessive use of salt 1,687 times (CI:1.075–2.647), weight gain in the last five years 1,411 times (CI: 1018–1955), use of small bras 3,260 times (CI: 2204–4821), and finally use of large bras 1,896 times (CI: 1276–2817) according to the reference groups. Employment status, childbearing status and age, tea and coffee consumption, smoking and alcohol consumption habits, age of first bra use and frequency in use, do not affect the frequency of breast pain ($p>0.05$). When the risk factors are separately evaluated according to breas pain types, the risk factors for periodic breast pain are found to be being a university graduate (OR: 2.179, CI: 1.558–3.047), BMI of over 30 (OR: 1.914, CI: 1.180–3.104), excessive use of salt (OR: 1.947, CI: 1.281–2.958), weight gain in the last five years (OR: 1.458, CI: 1.068–1.991), use of bras that are too small (OR: 2.897, CI: 1.978–4.244) or use of bras that are too large (OR: 1.874, CI: 1.263–2.783). The risk factors for non-periodic breast pain are higher for university graduates (OR: 1.792, CI: 1.165–2.756), and for those whose age of regular bra usage is above 16 (OR: 2.081 CI: 1.367–3.170).

Discussion

The incidence of breast pain in women participating in this study was 58.6% (n=441); among those, 73.9% experienced periodic breast pain, and 26.1% experienced non-periodic breast pain. The evaluation of the literature in this area shows that in varying proportions of 48 to 81%,[2,3,6,7] women experienced mastalgia. The vast majority of the studies of mastalgia consists of the information obtained from the records of hospital clinics admissions by women,[3,10,21] while community-based studies are less frequent.[6] The prevalence obtained from this community-based study could be valuable in providing information about the prevalence of mastalgia throughout society. Both breast clinic studies as well as community-based studies show that mastalgia is a problem that affects women as a whole. Another finding that is consistent with the literature is that cyclical mastalgia is experienced among women more than other forms. It is reported that two-thirds of women with mastalgia experience periodic breast pain and one-third of women experience non-periodic breast pain.[22] This is similar to the rate that is seen in this study.

Women experiencing pain in the study stated that the severity of pain was 4.54±2.1; 25.4% reported that it affected their daily life, 29.9% reported that it affected level of their sleep, and 22.9% reported that affected their sexual life. In the studies conducted, women assessed their breast pain level also as moderate. Ader and Shriver[2] conducted a study and found 6.5 (sd: 1.8) pain intensity on a 10 grade Visual Analog Scale (VAS) among women who experienced tenderness. In another study, 82% of women who experienced mastalgia determined the pain intensity as 3.5 on a VAS.[3] In various studies,[2,3,21] different proportions of women experienced breast pain that affected their sleep, sexual life, and social and work/school life and activities. In current health understanding the quality of individual's life is considered as an important criterion of health. For the quality of life, the concepts such as daily life, pain, sleep, and social and work life are considered as important for personal satisfaction. It is observed that mastalgia is an issue to be addressed in improving the quality of life of women regarding its negative effects on a woman's life, especially in her daily life, sexuality and sleep. In his study on mastalgia, Guler[23] stated the negative impact on quality of life, especially in cases where the pain is constant.

In the current study, 57.6% of women rated their pain as tingling, 32.4% reported a feeling of weight, 10.4% reported the pain as throbbing, and 10.0% described a stinging sensation. Carmichael et al.[3] categorized the breast pain of women as mild (12%), uncomfortable (55%), problematic (22%), terrible (8%), and intolerable (3%). In the study of Smith et al.,[8] mastalgia was defined as "dull, heavy, or painful". Periodic breast pain with changes occurring in women experiencing premenstrual breast pain, tingling, a feeling of weightiness, and those living in non-periodic pain, can be defined as stinging or throbbing pain. Studies have reported that patients admitted to the hospital with severe breast pain in a manner consistent with non-periodic mastalgia received a diagnosis of fibrocystic disease.[23,24] In this study, the rate of women that identified their pain as

severe is close the proportion of women who were diagnosed with fibrocystic disease.

Among women with mastalgia, 29.5% (n=130) consulted a doctor. In the literature, admission rates for mastalgia to clinics are reported to be less than the rate of those who suffer from mastalgia.[23,25] The lower rate of applicants than those experiencing mastalgia is associated with the severity of the pain. It is stated that women with intense and severe pain seek treatment and that in particular the fear of breast cancer is an important factor for seeking treatment.[26] Among the women in the study who consulted a doctor, 51.5% had clinical breast examination, 43.1% had breast ultrasound, 20.0% had mammography; and biopsy was performed for very few women (7.7%) and pathology specimens were evaluated for others (6.9%). Although mastalgia causes mammography at an early age,[2,6] the results of this study show that breast ultrasound is more widely used. One-third of the women examined in this study had normal findings, more than half had benign masses, and malignant masses were found in only three cases. Follow-up was recommended for 76.5 % of women admitted to the doctor, and it was observed that 9.3% of women with chronic breast pain visited the doctor regularly for a check-up. The reason that women do not visit their doctor for regular check-ups for breast pain could be a prior diagnosis of normal or benign mass, which can alleviate concerns regarding cancer. Guler[23] reports that symptoms experienced decrease after women learn that they are not diagnosed with cancer.

Risk factors for experiencing breast pain include: being 35–50 years of age, a university graduate, having a BMI of over 30, use of excessive salt, weight gain in the last five years, and using too small or too large of bras. Employment status, childbearing age and status, tea and coffee consumption, smoking and alcohol consumption habits, and age of initiation of bra use and frequency of use do not affect the frequency of breast pain ($p>0.05$) (Table 2).

Mastalgia occurs more frequently in women over 30 years of age[4,25] and in another study conducted, the average age of onset of breast pain was determined as 36 years 1. Johnson et al.[7] found a higher incidence of mastalgia in the 35 to 55 age group. The average age obtained in this study was similar to that in the literature. Another risk factor determined in this study was the fact that women who graduated from university suffered from mastalgia more frequently. This situation can be explained by a psychogenic origin of breast pain. Women university graduates might have greater opportunities to participate in professional life and are also forced to cope with stressors such as child care and family responsibilities. Stressors can be the cause of psychogenic health problems in women. It is reported in the literature that anxiety, depression, somatization, and emotional abuse may be related to mastalgia.[6,13] In addition, an increased level of education of women may increase the awareness and level of care for their health and the ability to better identify pain through more information.

The fact that BMI over 30 and weight gain in the last five years are determined as risk factors in the study is important regarding its demonstration that weight management can be an approach in the prevention of breast pain. When it is considered that the group with BMI over 30 experiences mastalgia two times more, it can be concluded that having BMI within the normal range can be important in the prevention of mastalgia. In addition, if women who suffer breast pain are also experiencing weight problems, weight loss could have a relaxing effect. Johnson et al.[7] identified the obesity as a risk factor in their study.

Pain may occur due to swelling caused by excessive salt consumption. The fact that women in the study defined the characteristic of the pain experienced as a feeling of "fullness" supports this interpretation. In this study, the use of salt was not designated as a risk factor for non-periodic mastalgia, which is seen as a risk factor for periodic mastalgia. It may be necessary for women to reduce their salt intake prior to menstrual periods for the prevention of cyclical mastalgia. Although decreasing dietary fat, salt, and caffeine is a part of non-pharmacological control of mastalgia, the effectiveness of dietary interventions are controversial.[27]

The use of bras for women comes to the forefront of aesthetic concerns, as opposed to health benefits. In this study, using large or small bras are identified as risk factors. Especially women who use a bra smaller

in size experienced mastalgia 3.260 times more compared to those who used the appropriate size. Santer and Mansel[11] stated the pressure of a smaller bra is among one of the etiologies of mastalgia. Wood et al.[28] found a minor relation between small bras and the severity of pain. The use of large bras might also be risk factor due to not securing the shape of breast against the force of gravity. For women marathon runners, among the other factors, bras hold an important place in the increase of mastalgia risk.[12] Using a proper supportive bra may have an important role in the prevention of or reduction of Mastalgia.[15,27] It is indicated that mastalgia due to macromastia may be prevented, particularly with large breasts.[15] However, studies suggest that a great majority of women (80–90%) are not using an appropriate bra.[28–30] In contrast, considering the widespread use of bras among women, we can predict that there is a high possibility of problems that women may face due to not using the correct size bras. For this reason, the size and manner of wearing bras should be evaluated in each and every woman experiencing mastalgia. A relationship was not established between the following factors and mastalgia: fertility characteristics of some of the women in this study, the use of birth control pills, tea and coffee consumption, smoking and alcohol use. No relationship was established between tea and coffee consumption, tobacco and alcohol consumption in this study. Previous studies have indicated that especially tea, coffee, smoking, and alcohol consumption may yield to mastalgia and a reduction of the consumption of those can be a lifestyle change that is recommended in the treatment of mastalgia.[6,7,27]

The risk factors according to the type of periodical breast pain included: being a university graduate, having a BMI over 30, use of excessive salt, weight gain in the last five years, and using smaller or larger bras. In the assessment of periodic breast pain, risk factors were defined as in breast pain. Similar risk factors determined can be explained, as they formed a larger part of the group. A point to be added here is that women do not change the size of their bra, in spite of changes in their breast tissue. During periods when hormonal balances change in the woman's life (pregnancy, lactation, etc.) and due to weight loss or gain, bra size may also change in women.[31] Despite changes in their body, if women do not change the size of bra, they may experience pain. The risk factors for periodic breast pain revealed in this study support this interpretation. It is observed that periodical mastalgia is associated with factors affecting the breast size (excessive use of salt, gaining weight) and that mastalgia is more common in women with an inappropriate preference of bra size for their body. Therefore, women should be counseled about the selection of an appropriate bra size for their bodies.

Risk factors for non-periodic breast pain include: being a university graduate and the fact that the initial age of regular bra use was 16 years and above. In girls, the start of breast development begins at 8–13 years of age and the need to wear a bra begins just a few years later.[30] The findings of the study might suggest that the late onset of bra wearing could lead to some structural breast problems. However, this information should be evaluated in case-control or cohort studies. Studies evaluating the relationship between the onset age of bra wearing and mastalgia could not be determined in the literature. For this reason, reviewing of this information for researchers working in this area may be important. As it takes an important place in the life of women, such features such as the quality of the bra used, frequency of usage, and onset age of use must be evaluated with cohort studies to reveal important information about the relationship between mastalgia, thoracic pain, and cystic formations.

Conclusion

The findings of this study revealed that mastalgia is common among women, that the women at 35–50 years of age and university graduates are within the risk group; and that BMI over 30, use of excessive salt, weight gain in the last five years, and using not proper bra for their body are risk factors for mastalgia. Furthermore, the onset of wearing bra at 16 years of age or above is determined to be a risk factor of non-periodic breast pain. However, due to the fact that the study is a cross-sectional one and that it is based on self-reporting of individuals, the limitations have to be taken into account and the risk values obtained from the study must be assessed as a raw proportion of the overall risk. These findings should be evaluated again based on objective data in a different society. It is especially important that health care workers should be aware of the change-

able risk factors defined in this study in the clinical applications related with mastalgia.

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