Acıbadem Univ. Sağlık Bilim. Derg. 2023; 14 (3): 409-414
https://doi.org/10.31067/acusaglik.1266533

ORIGINAL ARTICLE / ARAŞTIRMA YAZISI

Psychiatry / Psikiyatri

Distress Tolerance in Patients with Metastatic and Non-metastatic Breast Cancer: A Single-center Experience

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Received: 17 March 2023
Accepted: 04 May 2023

ABSTRACT

Purpose: Psychosocial difficulties occur in patients with breast cancer for many reasons including long-term treatments, organ loss, or deformity. Accordingly, we aimed to compare differences in distress tolerance levels between metastatic and non-metastatic female patients diagnosed with breast cancer and receiving chemotherapy. We also evaluated the possible relationship between distress tolerance levels and with background and clinical characteristics of the patients.

Methods: 208 eligible female patients with breast cancer who received at least three chemotherapy sessions were included in our study. According to the presence of metastasis, the patients were divided into two groups those receiving palliative (metastatic, n=126) and adjuvant (non-metastatic, n=82) chemotherapy. Besides the study-specific data form, the Distress Tolerance Scale (DTS) was applied to patients to assess distress tolerance levels.

Results: The age of participants was statistically significant between the non-metastatic and metastatic patients($p<0.05$). There was no significant statistical difference in DTS scores between non-metastatic and metastatic patients. DTS levels were significantly correlated with the presence of inpatient admission. Multiple linear regression analysis indicated that the absence of inpatient admission was significantly associated with DTS levels in patients with breast cancer (B:-13.792, $p<0.01$).

Conclusion: Distress tolerance is important in such a long-term illness to cope with the difficulties in the treatment. Distress tolerance may not be directly related to the stage of illness. Since inpatient admission reduces distress tolerance, it may be important in the treatment processes of these patients. Preventing possible causes of hospitalization may have positive effects on the capacity of these patients to cope with stress.

Keywords: Breast cancer; Distress; Distress tolerance; Hospitalization; Metastasis

Metastatik ve Metastatik Olmayan Meme Kanserli Hastalarda Sıkıntı Toleransı: Tek Merkez Deneyimi

ÖZET

Amaç: Meme kanseri tanılı hastalar uzun süreli tedaviler, organ kaybı ya da deformite gibi birçok nedenden dolayı psikososyal zorluklar yaşamaktadır. Çalışmamızda meme kanseri tanısı almış ve kemoterapi alan metastatik ve metastatik olmayan kadın hastaların sıkıntı tolerans seviyelerindeki farklılıkların karşılaştırılması amaçlanmıştır. Ayrıca, sıkıntı tolerans düzeyleri ile hastaların klinik özellikleri arasındaki olası ilişkinin değerlendirilmesi amaçlanmıştır.

Yöntemler: Çalışmamıza meme kanseri tanılı, en az üç kemoterapi seansı almış 208 kadın hasta dahil edildi. Metastaz varlığına göre hastalar palyatif (metastatik, n=126) ve adjuvan (non-metastatik, n=82) kemoterapi alanlar olarak iki gruba ayrıldı. Çalışmaya özgü veri formunun yanı sıra, hastalara sıkıntı tolerans düzeylerini değerlendirmek için Sıkıntı Tolerans Ölçeği (DTS) uygulandı.

Bulgular: Metastatik olmayan ve metastatik hastalar arasında katılımcıların yaşı istatistiksel olarak anlamlı saptandı ($p<0.05$). Metastatik olmayan ve metastatik hastalar arasında DTS skorlarında anlamlı bir istatistiksel fark bulunmadı. DTS seviyeleri, yatarak tedavi görmüş olmak ile anlamlı bir şekilde ilişkiliydi. Çoklu lineer regresyon analizi, meme kanserli hastalarda yatarak tedavi olmamasının DTS düzeyleri ile anlamlı şekilde ilişkili olduğunu gösterdi (B:-13.792, $p<0.01$).

Sonuç: Bu uzun süreli hastalıkta, tedavideki zorluklarla baş edebilmek için sıkıntı toleransı önem arz etmektedir. Sıkıntı toleransı, hastalığın evresi ile doğrudan ilişkili olmayabilir. Ancak yatarak tedavi görmüş olmak sıkıntı toleransını azalttığının saptanması, bu hastaların tedavi süreçlerinde önemli olabilir. Olası hastaneye yatış nedenlerinin önlenmesi, bu hastaların stresle baş etme kapasitelerini olumlu yönde etkileyebilir.

Anahtar Kelimeler: Meme kanseri; sıkıntı; sıkıntı toleransı; hastane yatışı; metastaz

Female breast cancer is the most commonly diagnosed cancer with an estimated 2.3 million new cases, representing 11.7% of all cancer cases in 2020 (1). Breast cancer has several negative results such as worse body image and disturbances in sexual life as a result of treatment including mastectomy or breast-conserving surgery (2). Menopause caused by the treatments like chemotherapy, hormonal therapies that cause ovarian function suppression or surgery can be an obstacle in front pregnancy since this cancer is common in women of reproductive age (3). The outcomes of treatment and the process of the disease have been found to be related to depressive symptoms (3). In addition, psychosocial distress has long been identified as a significant issue for breast cancer patients who come up against difficulties in many different areas.

Distress has been defined by the National Comprehensive Cancer Network as an unpleasant experience of a mental, physical, social, and spiritual nature that can affect the way of thought, feelings, or acts (4). It is a complex psychosocial phenomenon that include certain emotions such as sadness, fear, and helplessness. Although distress is an expected reaction during cancer care, it may result in difficulties in coping with cancer. Carlson et al. (2004) stated that 37.8% of 3095 patients diagnosed with different kinds of cancer had distress in the clinical range (5). Pain and distress have been defined as the '5th and 6th vital signs' respectively in cancer patients alongside the four vital signs that are standard in medical settings body temperature, heart rate, blood pressure, and respiratory rate (6). This conceptualization of distress as the 6th vital sign provided a framework for care providers to understand the emotional difficulties in cancer patients. In addition, the definition of distress drew attention to the early identification and treatment of emotional distress in cancer and many cancer centers have developed screening programs aimed at identifying distress in patients early in their cancer trajectory like in Canada (7). Numerous studies have reported that different distresses cause depression and anxiety disorders. Also, depression and anxiety have been associated negatively with treatment adherence, quality of life, and poorer survival (5,6). Distress tolerance is defined as the perceived capacity to endure and cope with negative physical or emotional states (8,9). Distress tolerance is conceptualized as a transdiagnostic risk factor in the onset and maintenance of a wide range of psychiatric disorders including depression and anxiety (10,11). Research has demonstrated that reduced distress tolerance significantly causes the use of maladaptive emotion regulation strategies including suppression of feelings, avoidance, and rumination. In addition, low distress tolerance has been associated with both poorer quality of life and reduced life satisfaction (12,13). It has also been suggested that patients with a cancer diagnosis have a negative effect in terms of distress tolerance (14).

Previous studies reported that patients with breast or other types of cancer suffer from significant psychological distress at all stages of illness (15). However, distress tolerance has not been sufficiently examined in this patient population, in those with breast cancer, particularly. The primary aim of this study was to define distress tolerance levels in breast cancer patients and compare them between metastatic and non-metastatic patients. The possible relationship between distress tolerence levels and background/clinical characteristics of the patients was also examined. We hypothesized that patients with metastatic breast cancer would have reduced distress tolerance and several clinical factors such as duration of illness, and the total number of chemotherapy sessions is correlated with distress tolerance levels

Methods

Participants and study procedure

In this cross-sectional study, female patients who received chemotherapy in the outpatient clinic of the Medical Oncology Department at Bakirkoy Dr. Sadi Konuk Training and Research Hospital (Istanbul, Turkiye), between September 2022 and November 2022, were initially screened for the study. The patients were independently evaluated in terms of a possible diagnosis independently by two senior psychiatrists. Inclusion criteria for all participants were as follows: 1) over 18 years old; 2) receiving chemotherapy at least three cycles. Presence of illiteracy, a comorbid psychiatric/neurologic disorder and not giving a consent to participate to the study were set as exclusion criteria. After applying inclusion/exclusion criteria, 208 eligible patients were enrolled. The study was approved by the Bakirkoy Dr. Sadi Konuk Training and Research Hospital Ethics Committee [IRB:19.09.2022 - 2022/299] and conducted according to the Helsinki Declaration. Written informed consent was obtained from all participants following a thorough explanation of the study procedure. A semi-structured background data form including sociodemographic and clinical information of the patients was filled whereas Distress Tolerance Scale (DTS) were administered to all participants.

Assessment of distress tolerance

Distress tolerance was assessed with the DTS a self-report questionnaire that aims to measure individual differences in the capacity of distress tolerance (8). This scale was designed to withstand negative affect or other aversive psychological and/or physical states. Items are rated on a 5-point Likert scale (5=Strongly disagree to 1=Strongly agree). A participant could have a score between 15-75 and higher scores were considered to correspond to greater levels of distress tolerance. The Turkish version of DTS has been validated in a Turkish sample (16).

Statistics

The data were analyzed using the Statistical Package for Social Sciences for Mac OS, Version 25.0 software (Armonk, NY: IBM Corp.). After analysis of the descriptive data, Skewness and Kurtosis are used to describe the spread and height of the normal distribution of the numeric data before running analyses. Accordingly, independent samples t-test was used as a parametric test for continuous variables. Either Spearman's rho test or Pearson's correlation test was used to evaluate the relationships between quantitative variables. Multiple linear regression analysis was used to determine the predictive power of sociodemographic and clinical factors on the level of DTS. Significance was evaluated at p <0.05 levels.

Results

The study population (n=208) consisted of 126 patients with non-metastatic breast cancer (60.6%) and 82 patients with metastatic breast cancer (39.4%). The mean age of the sample was 50.95 (SD=11.32). The mean age of the non-metastatic patient group was 48.69±11.2 years and 54.41±10.67 years for the metastatic group. The mean age was significantly higher in metastatic patient group (t= -3.662, p<0.001). Duration of illness (months) was significantly longer in patients with metastatic breast cancer (t= -22.650, p<0.001). The total number of chemotherapy sessions was significantly higher in metastatic patients (t= -20.930, p<0.001). The presence of a systemic disease including diabetes mellitus, hypertension, coronary artery disease, and chronic renal failure was significantly prevalent in the metastatic patient group ((χ2 =12.640, p<0.001). There was no significant statistical difference in DTS scores between non metastatic and metastatic breast cancer patients (t= 0.993, p=0.322). Comparisons of descriptive and clinical characteristics according to the presence of metastasis were presented in Table 1.

Table 1. Descriptive variables of the patients diagnosed with breast cancer according to presence of metastases

	Non-metastatic (n=126)	Metastatic (n=82)		
	Mean±SD/ n(%)	Mean±SD/ n(%)	t/X^2	p
Age	48.69±11.2	54.41±10.67	-3.662	**<0.001**
Marital status				
Unmarried/ single	12 (9.5)	10 (12.2)	.375	.540
Married	114 (90.5)	72 (87.8)		
Education				
≤ 8 years	63 (50)	41 (50)	.000	1.000
> 8 years	63 (50)	41 (50)		
Employment				
Unemployed/ irregular	97 (77)	60 (73.2)	.390	.532
Regular	29 (23)	22 (26.8)		
Inpatient admission				
Absent	125 (99.2)	66 (80.5)	23.190	**<0.001**
Present	1 (0.8)	16 (19.5)		
Duration of illness (months)	5.76±1.49	41.4±14.19	-22.650	**<0.001**
Total number of chemotherapy session	4.73±1.49	15.45±4.47	-20.930	**<0.001**
Comorbidity				
Absent	96 (76.2)	43 (52.4)	12.640	**<0.001**
Present	30 (23.8)	39 (47.6)		
DTS score	47.12±12.43	45.58±9.84	0.993	0.322

DTS: Distress tolerance scale
t: Independent samples t test
χ^2: Chi-square for categorical variables
SD: Standart deviation
p<0.05 statistically significant

We further evaluated the correlation between sociodemographic and clinical features (Table 2). Age was significantly correlated with the duration of illness (r=.209, p<0.01), the total number of chemotherapy sessions (r=.223, p<0.01), the presence of comorbidity (r=.740, p<0.01), and the presence of metastasis (r=.247, p<0.01). DTS scores of patients were significantly correlated with the presence of inpatient admission which means patients with the absence of inpatient admission have higher levels of distress tolerance (r= -0.270, p<0.01). Other correlations were presented in Table 2.

Table 2. Correlations between clinical features and DTS in all participants

r	Age	DTS	Duration of illness (months)	Total number of chemotherapy session	Presence of comorbidity	Presence of inpatient admission	Presence of metastases
Age	1	-.034	.209**	.223**	.740**	.113	.247**
DTS		1	-.021	-.060	.013	-.270**	-0.88
Duration of illness (months)			1	.972**	.188**	.332**	.850**
Total number of chemotherapy session				1	.200**	.370**	.846**
Presence of comorbidity					1	.163*	.247**
Presence of inpatient admission						1	.334**
Presence of metastases							1

Note: r: Spearman's rho correlation coefficient
**p<0.05 and **p<0.01 statistically significant*

The putative relationship between clinical variables and DTS was further tested in a linear regression analysis. Age, duration of illness, total number of chemotherapy session, presence of comorbidity, presence of inpatient admission, and presence of metastasis were entered in the regression model and stepwise method was used. The analysis indicated that absence of inpatient admission (β-13.792, p<0.01) was significant predictor of higher levels of DTS scores in patients (Table 3).

Discussion

This study is the first to evaluate distress tolerance with DTS in patients with breast cancer according to the presence of metastasis. According to our results, presence of inpatient admission has been found related with low DTS scores. In addition, we found that presence of inpatient admission increased the probability of low DTS in 13 times. Herschbach et al. defined that the most distressed diagnostic subgroups are patients with soft tissue tumours and breast cancer patients (17). However, Carlson et al. determined that being female and having diagnoses of pancreatic or lung cancer were related to the increased likelihood of distress through distress thermometer (18).

Table 3. Results of Linear Regression for high DTS score's predictors

	B	S.E.	p	95% CI
Total number of chemotherapy session	0.228	0.346	0.511	-0.455 — 0.911
Duration of illness (months)	0.152	0.114	0.181	-0.072 — 0.376
Presence of comorbidity	3.619	2.512	0.151	-1.334 — 8.572
Presence of inpatient admission	-13.792	3.217	**<0.001**	-20.136 — -7.449
Marital status (single)	0.239	2.885	0.934	-5.450 — 5.928
Education (≤8 years)	-0.551	2.320	0.813	-5.125 — 4.024
Employment (Unemployed/irregular)	0.819	2.343	0.727	-3.801 — 5.440
Presence of metastases	-6.890	3.697	0.064	-14.179 — 0.400
Age	-0.144	0.135	0.285	-0.410 — 0.121

Note: Adjusted R2=0.065
dependent variable: DTS score,
S.E: standart error
CI: confidence interval
p<0.05 statistically significant

We have found that age significantly differs between the metastatic and non-metastatic groups consistent with the literature (19). Naik et al. determined that younger adults with cancer experience higher rates of depression and anxiety symptoms after diagnosis (20). However, they reported that young adults had more metastatic disease at diagnosis which may affect their distress level. Another finding of this study is that the presence of inpatient admission, longer duration of illness, and the higher total number of chemotherapy sessions were more prevalent and statistically significant between the groups in terms of metastasis. However, DTS scores did not differ significantly between the groups. Although it is expected that metastatic patients will have less distress tolerance, this finding may be interpreted as patients with metastases may develop an endurance to manage distress in the treatment process. Psychological resilience is generally known as a phenomenon with multifactorial components, resilience is often defined as positive responses or outcomes in the face of significant risk or adversity (21). The lack of difference in distress tolerance levels between metastatic and non-metastatic patients may be due to the compensatory development of metastatic patients' resilience in the process.

Our findings indicated no statistical significance of the correlation between age and DTS scores which means distress tolerance did not differ according to age. However, emotional distress has been found more common in younger versus older patients with cancer (22). In addition, this study found that high DTS scores which mean a high capacity of distress tolerance are related to the absence of inpatient admission. This result may be interpreted as the possible effects of distress on the treatment as seen in the previous studies (1,2). Another important finding of our study is that the absence of hospitalization predicts a high DTS score and increases a high DTS score 13.7 fold. In previous studies, it has been shown that the follow-up of cancer patients, predominantly in outpatient clinics, significantly reduces hospitalizations due to chemotherapy-related side effects (23). Considering that the absence or minimization of inpatient admissions in cancer treatment is a trend, it can be concluded that continuing therapy outside increases the tolerance of distress.

Considering the close relationship between distress tolerance and psychiatric diseases, it is important to measure tolerance in groups with increased distress (10,11). These findings give clinicians a clue about the careful psychological assessment needed for patients. Although the psychosocial effects of each type of cancer on the person are different, many factors such as ethnicity, socioeconomic status, and education level can also affect the psychosocially to patients (18). We should avoid generalizations and adopt personalized approaches in psychosocial evaluations and referrals for cancer patients, just as personalized approaches come to the fore in current cancer treatment.

Some of limitations of the current study were its relatively small sample size and patients from a single department of oncology. Also, application of limited psychometric research tools may preclude the generalizability of our findings. We may recommend including inventories for evaluating depression, anxiety, and other symptom screening scales. In addition, it can be stated as another limitation that we did not specify whether patients received previous psychological support or what the patients' social support systems were like.

Conclusion

In conclusion, this study demonstrates the levels of distress tolerance did not differ between the breast cancer patients with or without metastasis. This result may be a finding showing that the resistance of metastatic patients gradually increases in the treatment process. Another important result of our study is the demonstration that distress tolerance is higher in people who are not hospitalized. Continuation of outpatient treatment has been shown in previous studies to reduce other chemotherapy-related side effects. Similarly, the absence of hospitalization may have a positive effect on treatment by increasing distress tolerance. This study managed to highlight not only the comparison of DTS scores in patients with breast cancer but also the other possible factors that could affect distress tolerance. We emphasize the DST, a feasible and readily available tool assessing distress tolerance, which every clinician can utilize before starting treatment in patients with breast cance to consider possible predisposition psychiatric disorders in their patients. Further research is required to measure distress and distress tolerance with a wider spectrum of effects.

Declarations

Ethical Statement

The study was approved by the local ethics committee [IRB: 19.09.2022 - 2022/299]. Following a thorough explanation of the study procedure, all participants or (where necessary) their legal representatives/guardians provided written informed consent for participation in the study. The study was conducted according to the Helsinki Declaration. The current paper is has not been published or presented previously.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosures of Financial or Other Potential Conflicts of Interest

None.

Acknowledgements

None.

Authors Contribution

GSE: conceived and design the analysis, collected the data.

SSKB: contributed data and analysis tools, performed the analysis, wrote the paper.

MNN: conceived and design the analysis, collected the data.

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