Effects of COVID-19 Pandemic on Perceived Stress, Quality of Life, and Coping Strategies of Women With Breast Cancer With Spinal Metastasis Under Chemotherapy

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Abstract
Objectives: Women with breast cancer spinal metastases are highly prone to coronavirus disease 2019 (COVID-19), resulting in the incidence of stress in these women. The present study aimed to investigate the perceived stress and its effect on the quality of life (QoL) and coping strategies of female chemotherapy patients with breast cancer spinal metastases during the COVID-19 pandemic.
Materials and Methods: This descriptive-correlational study was conducted during February 20, 2020 and May 21, 2020 at Tabriz University of Medical Sciences during the COVID-19 pandemic. A total of 61 female chemotherapy patients with breast cancer spinal metastases completed the Perceived Stress Scale (PSS) and Billings, SF-36 questionnaire, and Moos' Coping Checklist. The data were analyzed in SPSS using the Pearson correlation coefficient test at the significance level of $P < 0.05$.
Results: The overall perceived stress level of the participants was high (51.10 ± 2.45). The overall score of coping strategies was 46.10 ± 1.15 while the scores of problem- and emotion-focused subscales were 22.25 ± 1.41 and 30.42 ± 01.30, respectively. The perceived stress level had a significant correlation with overall coping ($P = 0.009$, r = 0.8), emotion-focused coping ($P = 0.04$, r = 0.5), and problem-focused coping ($P = 0.02$, r = 0.6) strategies. Finally, the results showed poor relationships between problem-focused and physical health ($P = 0.009$, r = 0.4), problem-focused mental health ($P = 0.01$, r = 0.4), emotion-focused and physical health ($P = 0.02$, r = 0.3), and emotion-focused and mental health ($P = 0.03$, r = 0.3).
Conclusions: Based on the findings, there are direct correlations between the perceived stress (strong) and QoL (poor) levels of female chemotherapy patients with breast cancer spinal metastases and their coping strategies during the COVID-19 pandemic.
Keywords: Breast Cancer, Spinal metastasis, Perceived stress, Coping strategies, COVID-19

Introduction

Extensive changes occurring in physical, mental, psychological, and social aspects, as well as the quality of life of (QoL) women during the diagnosis and treatment of breast cancer increase their anxiety and stress levels. More precisely, these women may experience constant stress due to their worries about survival and health status, the unknown nature of cancer, complicated treatments, and self-care methods, and the like (1-3). This stress is associated with an increased risk of mental (most common), physical, social, and occupational disorders, along with the increased use of health services. It can also stop the treatment process, which can be highly dangerous for breast cancer patients. On the other hand, this perceived stress can have adverse effects on various aspects of QoL, resulting in multiple problems (4).

It is worth noting that the levels of tension and stress experienced by people largely depend on their coping strategies, perception, and judgments. The negative effects of some coping strategies on people's health may outweigh those of common life stressors. People use different methods to cope with stressful events or stimuli. Some individuals deal with such events extremely successfully and efficiently, however, stressful events can inflict serious damages to the lives and mental health of weak people (5,6).

There is a significant relationship between mental health and coping strategies since further use of problem-focused coping strategies is associated with greater mental health while lower anxiety and stress levels, and vice versa. In other words, coping strategies can be effective in dealing with different chronic, and in particular, acute stresses (7).

The coronavirus disease 19 (COVID-19) pandemic affects many people (8). Chemotherapy drugs weaken the immune system of cancer patients and make them more susceptible to COVID-19, and finally, due to the adverse effects of stress on QoL. In addition, based on recent studies, COVID-19 negatively affects the human nervous system. These issues can increase stress levels and disrupt the treatment process in cancer patients. Therefore, this

study investigated perceived stress levels and its effect on the QoL and coping strategies of female chemotherapy patients with breast cancer spinal metastases during the COVID-19 pandemic.

Materials and Methods

Research Design

This descriptive-correlational study was carried out between February 20, 2020 and May 21, 2020 during the COVID-19 pandemic at the Oncology Departments of Shahid Ghazi Tabatabai and Shahid Madani hospitals affiliated with Tabriz University of Medical Sciences, Iran. The sample size was calculated based on the method used by Bahramnia et al (9) considering α=0.05, ß=80%, and 95% CI, and participants were selected through a convenience sampling technique. In total, 61 female chemotherapy patients with breast cancer spinal metastases were enrolled after signing informed consent forms. The exclusion criteria included having a history of mental problems (e.g., stress and depression) requiring treatment, suffering from COVID-19, suffering from memory disorders such as Alzheimer's disease and dementia, and having a COVID-19 positive family member.

Research Tools

A three-part comprehensive questionnaire was used as the data collection tool. The first part contained the demographic characteristics of the patients such as age, education, menopausal status, number of chemotherapy sessions, history of radiotherapy, and history of breast surgery.

The Perceived Stress Scale (PSS) was the second part. This 14-item questionnaire was developed by Cohen et al to assess an individual's perceived stress level over the past month. The items are scored on a 5-point Likert-type scale with a final score ranging from zero to 56, and higher scores indicate higher stress levels (10).

Billings and Moos' Coping Checklist formed the third part of the questionnaire. This 19-item checklist contains two subscales of problem-focused (8 items) and emotion-focused (11 items) coping strategies. The items are scored on a 4-point Likert-type scale ranging from zero to 3 and higher scores represent further use of coping strategies. The overall score of the checklist ranges from zero to 57 while those of the subscales of problem-focused and emotion-focused coping strategies range from "0 to 24" and "0 to 33", respectively (11).

Part 4 encompassed SF-36 QoL Questionnaire. It is used to assess the QoL and general health and has 36 questions and 8 subscales. These subscales include physical performance, social functioning, emotional role play, physical role-play, mental health, vitality, physical pain, and general health. Two final subscales of physical health and mental health are obtained by the integration of these subscales. The score of each dimension can be considered between 1 and 100 and higher scores demonstrate better QoL (12,13).

Procedure

After obtaining the approval of the Ethics Committee of Tabriz University of Medical Sciences and the permission from the authorities of Shahid Ghazi Tabatabai and Shahid Madani Hospitals, the researchers attended the relevant departments. They provided the participants with printed questionnaires, asked them to answer all questions within half an hour, and clarified any ambiguities. Finally, the questionnaires were collected, and the researchers assured that they are fully completed by the participants.

Statistical Analysis

The data were analyzed in SPSS20 using descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) to evaluate socio-demographic characteristics, perceived stress levels, and coping strategies levels. The normality of quantitative data was tested using Skewness and Kurtosis measures. Finally, the Pearson correlation test was used to investigate the relationship between perceived stress and coping strategies levels ($P<0.05$).

Results

The mean ($\pm$ SD) age of the participants was 55.25 ($\pm$ 3.41) years, most of whom (28-45.90%) were in the 50-60-year-old age group. In addition, 40-65.57% and 50-81.96% of them had high school diplomas and had reached menopause, respectively. Further, 36-59.01% and 29-47.54% of participants had a history of mastectomy and had attended 15-20 chemotherapy sessions, respectively (Table 1). Based on the results of the study on QoL subscales, the lowest and highest mean was related to vitality and emotional role-play, respectively. The mean ($\pm$ SD) of QoL subscales are provided in Table 1.

The mean ($\pm$ SD) score of the patients' overall perceived stress level was 51.10 ($\pm$2.45), indicating a high level of perceived stress. Furthermore, higher levels of perceived

Table 1. Demographic Characteristics and the Quality of the Life Levels of Participants

Variable	Number (%)
Age	
Mean ±SD	55.25±03.41
30-40	8-13.11
40-50	12-19.67
50-60	28-45.90
More than 60	16-26.22
Education	
Elementary	11-18.03
High school	40-65.57
University	10-16.39
Menopause	
Yes	50-81.96
No	11-18.03
History of radiotherapy	
Yes	9-14.75
No	52-85.24
History of breast surgery	
Lumpectomy	9-14.75
Mastectomy	36-59.01
No	16-26.22
Chemotherapy sessions	
Less than 10	6-09.83
10 -15	12-19.67
15-20	29-47.54
More than 20	14-22.95
Physical performance (Mean ± SD)	42.89±05.10
Social functioning (Mean ± SD)	44.80±05.45
Emotional role play (Mean ± SD)	45.19±05.85
Physical role play (Mean ± SD)	43.20±05.20
Mental health (Mean ± SD)	43.45±05.20
Vitality (Mean ± SD)	39.18±04.80
Pain (Mean ± SD)	42.80±05.60
General health (Mean ± SD)	42.15±05.80

stress were observed in over 60 patients, those with an academic degree, those with a history of mastectomy, and those who attended more than 20 chemotherapy sessions. The mean (± SD) overall score of QoL in patients participating in the study was 43.18 (±05.20), which represented a low QoL of participants. It was also found that the mean overall SD dimension of physical health and mental health dimension was 45.45 (±05.55) and 40.50 (±04.25), respectively, and there were no significant statistical differences between physical and mental health with demographic characteristics (Table 2).

The overall score of coping strategies was 46.10 (± 1.15) while the scores of problem- and emotion-focused subscales were 22.25 (±1.41) and 30.42 (±01.30), respectively. Based on the ANOVA test results, the highest scores for problem- and emotion-focused strategies were obtained for participants over the age of 60, those without a history of radiotherapy, and those with a history of attending more than 20 chemotherapy sessions. No significant relationship was found between the research variables and the demographic characteristics of the

participants (Table 3).

Pearson correlation test results revealed statistically significant relationships between the obtained perceived stress levels and the use of coping strategies, representing that higher stress levels led to further use of coping strategies. The results also showed that participants with higher stress levels mainly used problem-focused coping strategies rather than emotion-focused strategies (Table 4). The evaluation of the relationship between QoL coping strategies revealed poor relationships between problem-focused and physical health ($P=0.009$, $r=0.4$), problem-focused and mental health ($P=0.01$, $r=0.4$), emotion-focused and physical health ($P=0.02$, $r=0.3$), and emotion-focused and mental health ($P=0.03$, $r=0.3$), meaning that people use these strategies (to a lesser extent) even those with low levels of the QoL. Table 4 presents an examination of the relationships between coping strategies and the subscales of QoL.

Discussion

To the best of our knowledge, this is the first study to investigate the perceived stress levels and coping strategies of female chemotherapy patients with breast cancer spinal metastases during the COVID-19 pandemic in Iran. The results demonstrated that women with metastatic spinal cord cancer undergoing chemotherapy were under high stress and their QoL was low. In addition, a statistically significant correlation was observed between the perceived (strong) stress and the QoL (poor) with coping strategies. In this study, the participants had high levels of perceived stress, which is consistent with the results of similar studies. High stress levels are associated with several physical and mental disorders (e.g., anxiety, depression, sleep disorders, and exacerbation of various diseases) . They also adversely affect family functioning, marital relationships, and the QoL (14-17). Therefore, cancer patients must be provided with proper training on stress management strategies in order to manage their stress and prevent its negative consequences. It should be noted that this stress during the coronavirus pandemic can also lead to incontinence because cancer patients whose metastases have spread to different places are susceptible to fear of conflicts due to this disease. Accordingly, they have to consider this issue.

The results of another part of our study showed that the QoL of participants was less than average, which is in line with the results of a similar study (18). Understood stress, stressful atmosphere during coronary heart disease, fear of corona, and other factors that need further investigation appear to play a role in reducing the QoL of women with breast cancer. A low QoL can indicate a low level of public health in women with breast cancer, and if the QoL is low, special attention should be paid to the mental and physical needs of patients in order to improve their QoL and health.

In this study, participants' overall score of coping strategies was high. However, the obtained score for the

Table 2. Perceived Stress and the Quality of Life Levels of Participants

Variable		Perceived Stress	P Value	Physical Health	P Value	Mental Health	P Value
Age	30-40	48.33±01.48		45.15±05.15		45.15±05.15	
	40-50	49.25±02.10	0.219	45.00±05.80	0.310	45.15±05.15	0.359
	50-60	52.10±02.15		43.88±04.91		45.15±05.15	
	More than 60	53.20±02.15		42.20±04.15		45.15±05.15	
Education	Elementary	46.50±01.30		42.29±05.59		45.15±05.15	
	High school	51.10±02.45	0.119	43.99±05.15	0.293	45.15±05.15	0.189
	University	54.30±02.15		44.89±05.10		45.15±05.15	
Menopause	Yes	53.18±02.15	0.215	41.40±05.63	0.119	45.15±05.15	0.201
	No	45.45±02.01		45.15±05.50		45.15±05.15	
History of radiotherapy	Yes	50.15±02.15	0.301	42.40±05.50	0.259	45.15±05.15	0.303
	No	53.45±02.00		43.90±05.15		45.15±05.15	
History of Breast surgery	Lumpectomy	45.55±01.15		45.55±05.02		45.15±05.15	
	Mastectomy	52.15±02.18	0.119	44.70±05.50	0.319	45.15±05.15	0/398
	No	50.45±02.18		42.88±05.40		45.15±05.15	
Chemotherapy sessions	Less than 10	48.25±01.20		45.55±05.93		45.15±05.15	
	10 -15	49.15±02.10	0.109	44.75±05.15	0.401	45.15±05.15	0.413
	15-20	51.80±02.10		43.25±05.90		45.15±05.15	
	More than 20	52.25±02.75		42.40±05.50		45.15±05.15	

Note. Applied test: ANOVA: Analysis of variance.

Table 3. The Use of Coping Strategies by the Participants

Variable		Problem-Focused	P Value	Emotion-Focused	P Value
Age	30-40	20.15±00.15		39.55±01.15	
	40-50	20.99±00.57	0.303	30.15±01.25	0.215
	50-60	21.25±01.10		30.60±01.10	
	More than 60	23.10±01.49		31.15±01.10	
Education	Elementary	22.10±00.15		30.15±01.10	
	High school	22.30±01.30	0.201	30.95±01.95	0.115
	University	22.95±00.55		31.10±01.15	
Menopause	Yes	21.55±01.15	0.155	29.90±01.65	0.225
	No	22.95±00.80		30.95±01.45	
History of radiotherapy	Yes	21.80±01.10	0.189	30.01±01.10	0.307
	No	22.50±01.50		30.95±01.45	
History of breast surgery	Lumpectomy	21.33±01.10		29.50±01.20	
	Mastectomy	22.10±01.50	0.309	30.10±01.45	0.203
	No	22.40±01.20		31.01±01.10	
Chemotherapy sessions	Less than 10	21.90±01.50		29.95±01.10	
	10 -15	22.10±01.15	0.118	30.15±01.20	0.119
	15-20	22.45±01.10		30.60±01.45	
	More than 20	22.85±00.15		31.15±01.10	

Note. Applied test: ANOVA: Analysis of variance.

problem-focused subscale was higher than that of the emotion-focused subscale, which corroborates with the findings of other similar studies (19,20). It seems that female cancer patients adopt more coping strategies in order to deal with their mental health problems due to their high perceived stress levels and the high prevalence of COVID-19.

A significant correlation was found between perceived stress levels and perceived coping strategies. In addition, participants mainly used problem-focused coping strategies rather than emotion-focused strategies .The results further revealed that there are weak and positive relationships between coping strategies and the subscales of QoL, implying that coping strategies are used in people with low QoL although the use of these strategies is weak, which is consistent with the results of similar studies (21,22). In the problem-focused approach, people seek to manage stressful situations by themselves. This approach can be used when one believes that a stressor is controllable. The emotion-focused approach includes a wide range of skills from social support attraction to emotional discharge, denial, or avoidance. On the other

Table 4. Relationship Between Perceived Stress and the Quality of Life Levels and Coping Strategies

Variable	Relationship With the Overall Coping Strategies	Relationship With the Problem-focused Subscale	Relationship With the Emotion-focused Subscale
Perceived stress, *P* vlue (r)	0.009 (0.8)	0.02 (0.6)	0.04 (0.5)
Physical performance, *P* vlue (r)	0.015 (0.5)	0.02 (0.5)	0.02 (0.04)
Social functioning, *P* vlue (r)	0.01 (0.6)	0.009 (0.7)	0.011 (0.7)
Emotional role-play, *P* vlue (r)	0.025 (0.3)	0.031 (0.03)	0.04 (0.4)
Physical role-play, *P* vlue (r)	0.011 (0.3)	0.015 (0.4)	0.018 (0.4)
Mental health, *P* vlue (r)	0.019 (0.3)	0.018 (0.3)	0.02 (0.4)
Vitality, *P* vlue (r)	0.014 (0.3)	0.02 (0.4)	0.02 (0.3)
Pain, *P* vlue (r)	0.019 (0.3)	0.041 (0.2)	0.03 (0.3)
General health, *P* vlue (r)	0.015 (0.3)	0.02 (0.4)	0.02 (0.4)

hand, it can be inferred that the presence of breast cancer, as well as metastasis to other parts of the body leads to the belief in women that they are closer to death, and therefore, different aspects of their QoL are affected, and finally, they use some coping strategies because they have no hope for survival.

Conclusions

Based on the findings, there are direct correlations between the perceived stress (strong) and the QoL (poor) levels of female chemotherapy patients with breast cancer spinal metastases and their coping strategies during the COVID-19 pandemic.

Limitations of the Study

This was a cross-sectional study. Therefore, the relationship between anxiety and coping strategies may not be a cause-and-effect relationship, and we cannot firmly conclude whether ineffective coping strategies increase anxiety and stress levels or high levels of stress lead to the adoption of ineffective strategies.

Suggestions for Future Studies

Further relevant studies are required to improve our understanding of the subject. Factors such as social support, marital satisfaction, and the like, which can affect the levels of stress and anxiety, were not included in this study. Therefore, it is suggested that researchers conduct other similar studies in other cities with different climatic and cultural conditions. They can also carry out more studies to investigate the effect of different training methods on coping strategies employed by pregnant women.

Authors' Contribution

Study design: SC; Data collection: AD; Data analysis: MZ; Article submission and response to reviewes' comments: REZ.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

This study was approved by the Ethics Committee of Tabriz University of Medical Sciences (Ethics code: IR.TBZMED.REC.1398.1306). The participants were provided with free-of-charge enrollment. In addition, relevant health protocols were taken into account to prevent the transmission of coronavirus, and pencils were disinfected with alcohol before use. Eventually, the patients were informed about their rights to discontinue the study..

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