Objectives: The study aimed at investigating the specific role of social support types (SSTs) on quality of life (QoL) and its domains of women with breast cancer in Iran.

Methods: In this cross-sectional study, a number of 223 women with breast cancer visiting three cancer centers of Tehran, Iran, participated from October 2014 to May 2015. Medical Outcome Study-Social Support Scale and Functional Assessment of Cancer Therapy-Breast Cancer were used for data gathering. Backward multiple regression was utilized, adjusted by age, education, and family size.

Results: The study indicated positive correlations between all SSTs and QoL domains, whereas only positive social interaction (PSI) showed a significant association with physical well-being. PSI showed the only predictive performance in terms of all QoL outcomes, beyond the covariates.

Conclusions: The study revealed the PSI as the most influential support type to enhance all domains of QoL of women with breast cancer.

Key words: Breast cancer, positive social interaction, quality of life, social support

Introduction

Cancer is one of the most common causes of mortality worldwide, leading to 8.8 million deaths up to 2015. Studies have indicated that this trend will increase by 70% in the next two decades. Breast cancer is the most prevalent cancer among women, which affected 2.5 million cases by 2015 worldwide. According to the World Health Organization (WHO), the global mortality rate of breast cancer was 570,000 cases in 2015. Among the total mortality rate of breast cancer in 2012, 44% of the cases were Asian, 9% were from North America, and 12% were from African countries. In Asian countries, 639,824 cases were diagnosed with breast cancer in 2012. In Iran, 4815 cases were diagnosed with breast cancer in 2012. This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

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women were also diagnosed with breast cancer from 1991 to 2014.\[7] Some studies estimated the 1-, 2-, 3-, 10-year survival rate of breast cancer to be 95.8, 82.4, 69.5, 58.1 in Iran,\[8] and the age-standardized mortality rate dramatically increased for 1.40–3.52/100,000 during 1994–2004.\[9] It seems that this growing trend will increase the breast cancer-related morbidity among Iranian women about three times by 2035.\[10]

Various physical, psychological, and social problems can affect the patients’ quality of life (QoL), from the diagnosis to the end of treatment.\[11] As a multidimensional construct, QoL addresses the physical, emotional, social, and functional domains of the patient’s well-being.\[12] It can be a prognostic factor among cancer patients,\[13] and is also an essential factor in survival prognosis among breast cancer patients following the relapse.\[14] Due to the increasing rate of breast cancer in Iran,\[10] it is essential to pay more attention to address how the patient’s QoL can be improved.

Patients need to cope with the demands of their conditions to achieve a more favorable QoL. Studies have suggested that psychosocial factors can significantly affect the QoL of patients with breast cancer.\[15] Among these factors, a social network can provide patients with an information resource, which may help them to surpass their difficulties more effectively. The offered supports are useful to deal with cancer complications, which are mainly due to physical illnesses.\[16] Furthermore, social support may enhance the improvement of severe complications, including depression,\[17] posttraumatic stress disorder,\[18] and anxiety,\[19] in patients with breast cancer.

Based on the Medical Outcome Survey Social Support Scale (MOS-SSS) developed by Sherbourne and Stewart,\[20] social support among medically ill persons encompasses four dimensions, including emotional/informational support (EIS), tangible or material support (TS), positive social interaction (PSI), and affectionate support (AS). EIS evaluates the perception of having the people on whom the patient can count to share their problems and obtain relevant information that helps them to face their challenges. TS represents the perceived materialistic aids provided for the person, such as preparing meals, accompanying the patient to the medical center, and overcoming daily barriers. PSI reflects the existence of people, by whom the patients can establish pleasant relationships. Finally, AS evaluates the perception of having people who make the person feel significant and loveable by expressing emotions and affections. In general, the scale assesses to what extent the individual realizes that he/she is supported in confronting different situations through the course of a disease.\[20]

The relationship between social support and QoL, especially in patients with breast cancer is well-established.\[21,22] For example, it has shown that social support could moderate\[23] or mediate,\[24] the effects of the patients’ difficulties on QoL. Patients with stronger social support have higher resilience and better QoL.\[24] However, few studies have highlighted the specific role of different subtypes of social support on QoL.\[25] Sherbourne and Stewart emphasized that each social support type (SST) can contribute differently to the various aspects of patients’ lives.\[26] Moreover, only few studies have addressed the Sherbourne and Stewart’s conceptualization of social support among Iranian women with breast cancer. In addition, studies in Iran rarely have utilized the Functional Assessment of Cancer Therapy-Breast Cancer (FACT-B) to evaluate patients’ QoL, which addresses various domains of QoL in cancer patients, including breast cancer-specific symptoms.\[26] Therefore, the current study aimed at investigating the effects of different SSTs on each domain of QoL among Iranian women with breast cancer.

Methods

Research design and sampling

In this cross-sectional study, 223 patients were recruited from three hospitals in three cities of Iran between October 2014 and May 2015. The current study was derived from a larger research project investigating the psychosocial contributors to the QoL of women with breast cancer (PS-BrC2015). The following inclusion criteria were considered: (1) patients with female gender, (2) diagnosed with breast cancer at least for a month, (3) the age of 18 years and over, and (4) the ability to communicate in Persian. Patients with a history of major psychiatric disorders or metastatic brain tumors were not included in the study. Data were collected by face-to-face interview.

Instruments

Socio-demographic and clinical information included age, marital status, educational status, occupation, economic status, comorbidity, a history of breast cancer, the time since cancer diagnosis, and types of treatment.

Quality of life

FACT-B was employed to assess the QoL.\[27] FACT-B includes 36 questions, which assess five domains, including physical well-being (PWB, seven items), social/family well-being (SWB, seven items), emotional well-being (EWB, six items), functional well-being (FWB, seven items), and the breast cancer subscale (BCS, nine items). Items are scored on a 5-point Likert scale (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, and 4 = very much). PWB, FWB, SWB, and EWB were summed up to achieve the
FACT-General (FACT-G) score. Finally, the FACT-B total score was obtained by adding FACT-G and BCS scores. The higher score in subscales or total score indicates better well-being and QoL. Previous evaluations of the original, as well as the Persian version of FACT-B, indicated their appropriate reliability and validity.[20]

Social support

MOS-SSS developed by Sherbourne and Stewart was adopted to assess the perceived social support.[20] MOS-SSS consists of 19 items. Eighteen items compose four SSTs, including EIS (eight items), AS (three items), PSI (three items), and tangible/instrumental support (TS, four items) and the one remaining item is the total score. The items are scored on a 5-point Likert scale from 1 to 5. EIS includes the expression of positive affect, empathetic understanding, encouraging the expressions of feelings, and offering advice, information, guidance, or feedback. AS involves the expressions of love and affection. PSI is having someone else to do different social activities with. Finally, TS consists of the provision of material aid or behavioral assistance. Scores of both measures were calculated as the average score of the subscale items, transformed to a zero-to 100-item scale, in which higher scores indicate more support.[20] The validity and reliability of MOS-SSS were found acceptable among different samples and cultures,[29-32] and also in Iran.[33]

Ethical approval

All the ethical issues were considered based on the Helsinki Declaration. Informed consent was obtained from the patients prior to the study. They were informed that their participation in the survey was voluntary, and their treatment process would not be affected by withdrawal from the study. The study was approved by the Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran (Approval No. TUMS.1394.6049).

Statistical analysis

Descriptive analysis was performed to assess the sample characteristics using frequency and percentage as well as the mean, standard deviation, skewness, and kurtosis. No missing data were identified. The normal distribution of data was evaluated based on the standardized skewness to be below 3.29 for a medium sample size (n < 300).[34] Pearson product-moment coefficient was used to assess the correlations between variables. A series of simple and multiple linear regressions were used to analyze the predicting role of SSTs as an independent variable on QoL outcomes as a dependent variable. The recommendations were followed to examine the assumptions of regression.[35] Some demographic and clinical variables were tested to find out whether they show any correlation with the outcomes, to be included as covariate variables. Therefore, age, education, and family size were included as covariates.

Results

Sample characteristics

Table 1 shows the descriptive statistics of the sample characteristics and study variables. The age range of participants was 19–75 years, with a mean of 47.10 ± 9.10 years. The majority of participants were married (81.2%), unemployed (83.4%), and lived in rural areas (87.9%). The mean time since cancer diagnosis was 18.28 ± 5.02 weeks.

Table 2 presents the results of the study variables. The mean TSS and SSTs were moderately high ranging from EIS (76.01 ± 26.05) to the AS (80.08 ± 24.06). The FACT-B

| Table 1: Clinical and sociodemographic information of the study sample (n=223) |
|-----------------------------|-----------|
| Characteristics             | n (%)     |
| Age (years), mean±SD        | 47.10±9.10|
| Education status            |           |
| Illiterate                  | 21 (9.4)  |
| Primary                     | 51 (22.9) |
| Secondary                   | 38 (17.0) |
| High school                 | 80 (31.4) |
| University                  | 43 (19.2) |
| Marital status              |           |
| Single                      | 15 (6.7)  |
| Married                     | 181 (81.2)|
| Separated                   | 3 (1.3)   |
| Divorced                    | 6 (2.7)   |
| widowed                     | 18 (8.1)  |
| Employment status           |           |
| Employed                    | 37 (16.6) |
| Unemployed                  | 186 (83.4)|
| Place of living             |           |
| Urban                       | 27 (12.1) |
| Rural                       | 196 (87.9)|
| Household income level (n=178) |         |
| Poor                        | 93 (52.2) |
| Moderate                    | 60 (37.3) |
| High                        | 25 (14)   |
| Family history of cancer    |           |
| Cancer                      | 60 (26.9) |
| Other chronic disease       | 69 (30.9) |
| No family history           | 94 (42.2) |
| Treatment                   |           |
| Chemotherapy                | 137 (61.4)|
| Radiotherapy                | 89 (39.9) |
| Mastectomy                  | 156 (69.9)|
| Cancer peer group participation (yes) | 44 (19.7)|
| Time since cancer diagnosis (weeks), mean±SD | 18.28±15.02 |
| Family size (n), mean±SD    | 4.42±2.06 |
mean was obtained 90.32 ± 20.07. Because SWB and all social support variables violated the condition of normality, the two-step approach to achieve normally distributed data proposed by Templeton was applied. This procedure uses the Factorial Rank Order in the first step, followed by reversing the new data into the normally distributed one. Following the procedure, all variables showed normal distribution (standardized skewness < 3.29).

**Paired correlations**

As shown in Table 3, all SSTs were positively correlated with QoL outcome, except for EIS, AS, and TS with PWB ($P > 0.05$). The correlation coefficients ranged from $r = 0.16$ ($P < 0.05$) for TS and EWB to $r = 0.44$ ($P < 0.001$) for the PSI and SWB. TSS also showed no significant correlation with PWB ($P < 0.05$); however, it was correlated with the other QoL outcomes, ranging from $r = 0.43$ ($P < 0.001$) for SWB to $r = 0.19$ ($P < 0.01$) for BCS. The correlation between TSS and FACT-B was obtained $r = 0.35$ ($P < 0.001$).

**Regression results**

The initial multiple regression using the Enter method to include all SSTs, adjusted by age, education, and family size, resulted in no significant results for SSTs. In addition, the variance inflation factors ranged from 2.88 to 5.24, suggesting multicollinearity between the variables, which was supported by their inter-correlations (ranging from $r = 0.72$ to 0.87, $P < 0.001$). Therefore, the backward method was employed as recommended by Field,[37] in which the conditional probability below 0.05 for inclusion and above 0.10 for exclusion was defined.

Table 4 shows the results of multiple regression analysis, indicating the effects of each SST on QoL outcomes. EIS could not contribute to the prediction of any QoL outcome ($P > 0.10$). Furthermore, AS only remained in the models predicting SWB ($β = 0.18, P > 0.05$) and FWB ($β = 0.20, P > 0.05$), in accordance with the regression inclusion/exclusion criteria ($P < 0.10$). In addition, TS reversely predicted PWB ($β = −0.18, P < 0.05$) and FWB ($β = −0.21, P < 0.05$), although it showed no significant zero-order correlation with PWB ($P > 0.05$; Table 3) and positive zero-order correlation with SWB ($P < 0.001$).

However, PSI showed the best performance in predicting all QoL outcomes with positive effects on PWB ($β = 0.31$, $P < 0.01$), SWB ($β = 0.29, P < 0.01$), EWB ($β = 0.25, P < 0.001$), FWB ($β = 0.35, P < 0.01$), FACT-G ($β = 0.40$, $P < 0.001$), BCS ($β = 0.21, P < 0.01$), and FACT-B ($β = 0.39, P < 0.001$).

**Discussion**

The current study addressed the need to highlight the specific role of SSTs on different QoL domains in women with breast cancer. The results indicated the relatively high social support in patients. Some other studies in Iran also have shown that Iranian patients with cancer have received high levels of social support.[38] Patients with breast cancer in other countries also have received different levels of social support. For example, in Nepal, patients have received poor social support,[39] moderate levels in China,[40] whereas high levels of social support have been reported for African-American women with breast cancer in the USA.[41] The higher rates of social support provided for Iranian patients indicate a supportive environment, in which the patients may experience fewer complications. The moderate associations between SSTs and QoL outcomes indicated a clinical significance of 6% for TS to 19% for PSI in predicting patients’ overall QoL.

Particular to the study findings, PSI showed the best performance in predicting QoL domains. Specifically, PSI was found with a better functional relationship with QoL domains, both in terms of zero-order correlations and **Table 2: Descriptive statistics of study variables (n=223)**

| Variables | Minimum–maximum | Possible range | Mean±SD | Skewness (SE=0.16) | Kurtosis (SE=0.32) |
|-----------|-----------------|----------------|---------|-------------------|-------------------|
| PWB       | 0–28            | 0–28           | 17.01±6.71 | −0.30             | −0.77             |
| SWB       | 0–28            | 0–28           | 18.71±4.89 | −0.80             | 0.93              |
| EWB       | 0–24            | 0–24           | 14.84±5.25 | −0.44             | −0.31             |
| FWB       | 3–28            | 0–28           | 18.28±5.12 | −0.52             | −0.09             |
| FACT-G    | 17–102          | 0–108          | 68.83±16.54 | −0.52             | −0.27             |
| BCS       | 7–34            | 0–36           | 21.48±5.57 | −0.08             | −0.53             |
| FACT-B    | 28–134          | 0–164          | 90.32±20.07 | −0.37             | −0.36             |
| EIS†      | 0–100           | 0–100          | 76.01±26.05 | −1.15             | 0.48              |
| AS†       | 0–100           | 0–100          | 80.08±24.07 | −1.23             | 0.86              |
| TS†       | 0–100           | 0–100          | 80.07±24.71 | −1.38             | 1.19              |
| PSI†      | 0–100           | 0–100          | 78.03±25.95 | −1.23             | 0.75              |
| TSS†      | 0–100           | 0–100          | 77.70±23.70 | −1.20             | 0.77              |

*The scores for social support are transformed into the scale of 0–100. SD: Standard deviation; SE: Standard error; PWB: Physical well-being; SWB: Social well-being; EWB: Emotional well-being; FWB: Functional well-being; FACT-G: Functional assessment cancer therapy-general; BCS: Breast cancer subscale; FACT-B: Functional assessment cancer therapy-breast cancer; EIS: Emotional-informational support; AS: Affectionate support; TS: Tangible support; PSI: Positive social interaction; TSS: Total social support.

**Table 3: Correlation matrix with Pearson’s coefficients (n=223)**

| Variables | PWB | SWB | EWB | FWB | FACT-G | BCS | FACT-B |
|-----------|-----|-----|-----|-----|--------|-----|--------|
| EIS       | 0.13 | 0.41*** | 0.21** | 0.35** | 0.35** | 0.17** | 0.34*** |
| AS        | 0.13 | 0.43*** | 0.22** | 0.35** | 0.37** | 0.19** | 0.36*** |
| TS        | 0.05 | 0.39** | 0.16** | 0.20** | 0.25** | 0.18** | 0.25*** |
| PSI       | 0.20** | 0.44*** | 0.25** | 0.38** | 0.42** | 0.21** | 0.40*** |
| TSS       | 0.12 | 0.43*** | 0.22** | 0.34** | 0.36** | 0.19** | 0.35*** |

*P<0.05 level; **P<0.01; ***P<0.001 (two-tailed). EIS: Emotional-informational support; AS: Affectionate support; TS: Tangible support; PSI: Positive social interaction; TSS: Total social support; PWB: Physical well-being; SWB: Social well-being; EWB: Emotional well-being; FWB: Functional well-being; FACT-G: Functional assessment cancer therapy-general; BCS: Breast cancer subscale; FACT-B: Functional assessment cancer therapy-breast cancer.
On the other hand, it seems that the feeling showing a relatively strong, utilize more active coping mechanisms, manifesting a “fighting spirit” during the early stages of breast cancer. Interestingly, although the disease, especially cancer, connotes darkness in the patients’ lives, the findings suggested approaching the patients’ QoL positively. Thus, interventions may adopt the broaden-and-build theory of positive emotion, employing the patients’ close and safe relationships to reconstruct their personal resources, ranging from physical and intellectual to psychological and social resources.

It should be noted that PSI may evoke a shared feeling of an elevated mood, which might benefit the patients with some physical effects, including decreased pain. Psychologically speaking, the intimate interactors (e.g., friends) in a social context tend to mimic smiles and empathize with the expressed happiness. Thus, the nature of reciprocity in such quality times may provide a fruitful ground for broadening the positive effects of PSI. For example, patients who perceive their social relationships stronger, utilize more active coping mechanisms, manifesting a “fighting spirit” during the early stages of breast cancer. In addition, patients may find interpersonal positive reframing as a partnered coping mechanism to improve their condition. Therefore, given the importance of the positive interpersonal atmosphere in the enhancement of patients’ QoL, health practitioners may want to provide their patients with group or couple therapies as well as family and couple psychoeducation interventions to prevent the QoL reduction through the course of the disease and also indicate the positive influence of patients’ relationships on their lives.

Table 4: Multiple regression predicting quality of life outcomes via social support types (n=223)

| IV | PWB | SWB | EWB | FWB | FACT-G | BCS | FACT-B |
|----|-----|-----|-----|-----|--------|-----|--------|
| β  | ΔR² | β  | ΔR² | β  | ΔR²   | β  | ΔR²   |
| AS | -   | 0.04| 0.18| 0.19| 0.05   | 0.20| 0.14   | 0.17 | 0.03  | 0.16  |
| TS | -0.18*| 0.29**| 0.25***| 0.35***| 0.40***| 0.21***| 0.39***| 0.03**| 0.16**|
| PSI| 0.31***| -0.21*| 0.25***| 0.35***| 0.40***| 0.21***| 0.39***| 0.03**| 0.16**|

*P<0.05; **P<0.01; ***P<0.0001. Bolded βs are statistically significant. Italic βs are statistically non-significant, which remained, remains in the model due to P<0.10. Multiple regression was used with backward method, including EIS, AS, TS, PSI as independent variables with age, education, and family size as covariates. EIS could not remain in any model, which is excluded from the table. IV: Independent variables; DV: Dependent variables; EIS: Emotional-informational support; AS: Affectionate support; TS: Tangible support; PSI: Positive social interaction; PWB: Physical well-being; SWB: Social well-being; FWB: Emotional well-being; FACT-G: Functional assessment cancer therapy-general; FACT-B: Breast cancer subscale; ΔR²: Change in adjusted R² in reference to the covariate variables.
Limitations and recommendation

This study was conducted on a sample selected from the Capital city of Iran. Therefore, the results cannot be generalized to the whole Iranian population with breast cancer. Moreover, male patients constitute a tiny fraction of patients with breast cancer, with <1% of the diagnosed patients and a 5-year survival rate of 64% in Iran. Some studies revealed that men living with breast cancer perceived a lack of support services as the barriers to receiving adequate care. Thus, future studies may investigate male breast cancer patients in terms of social support to provide more male-specific knowledge in the field. Also, the cross-sectional design of the study hindered the causal inference, mostly in terms of PSI. Thus, future longitudinal studies are needed to investigate the patients’ social support to specify the direction of functional relationship with patients’ outcome, and how any improvement in patients’ condition might feed their opportunities to receive social support, especially in the form of PSI. Besides, in the current study, the differences in cancer stage were not considered that could moderate the results. Hence, further studies should consider the differences between early stages of cancer or the later stages regarding the functional relationships between social support and QoL. In addition, future studies are recommended to investigate the mechanism through which the perceived social support can influence the patients’ QoL, considering the psychological implications of the current study.

Conclusions

The results showed that Iranian women with breast cancer received relatively high social support. Also, the findings indicated PSI as the most influential SST, predicting all QoL domains in women with breast cancer. Besides, PSI showed a better PWB and BCS, suggesting a bi-directional relationship between QoL and social engagement. Finally, this study suggested using a salutogenic approach in providing interventions to enhance the patients’ QoL.

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Conflicts of interest

There are no conflicts of interest.

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