Pakistan Journal of Social Sciences

A Study of the Factors Affecting Quality of Life of Breast Cancer Patients

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Key words: Quality of life, breast cancer, physical well being, social well being, significant, effect

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Page No.: 97-102
Volume: 16, Issue 4, 2019
ISSN: 1683-8831
Pakistan Journal of Social Sciences

Abstract: Breast cancer has been considered as general malignancies among women in all countries. The previous studies explored that quality of life of breast cancer patients gave the main idea in expressing the different aspects of patients around different fields of wellbeing. This study explores different demographic and other factors (Physical well being, Psychological wellbeing, social wellbeing and spiritual wellbeing) that affect the Quality of Life (QOL) of breast cancer survivors. The data is obtained from female breast cancer patients who visited Institute of Nuclear Oncology and Medicine Lahore (INMOL) Pakistan during the period of November, 2016 to January, 2017 by face to face meeting and through mobile phones. The female patients who have completed their 1 year survivorship are included in the study and their physical well being, psychological wellbeing, social wellbeing, spiritual wellbeing and QOL are measured with a modified (adapted) questionnaire. The Analysis of Variance (ANOVA), Exploratory Factor Analysis (EFA) and structural equation modeling techniques are used to quantify the effects. The 36 total items are compressed in 6 factors using EFA techniquenamed as physical exertion, psychological well being, social well being, spiritual well being and quality of life. The value of 1267.401 and model fit indices (CFI, TLI; 0.85, 0.92) indicate a better fit. The value of RMSEA (0.07) is significant showing a good fit of the model. Also, different regression and correlation models are estimated through Structural Equation Modeling (SEM). The results of EFA and CFA indicate a good fit of model. The results show thatfamily income, social status, marital status, income having family history of breast cancer and length of breastfeeding period has significant effect on QOL of breast cancer patients. It is noticed that regression effect of physical exertion, psychological wellbeing and spiritual well being is significant on QOL of breast cancer survivors but social wellbeing has no significant effect.

INTRODUCTION

Cancer is a group of diseases that build harmful cells or mass in the body called a tumor. Mostly they are named after the part of the body where the tumor originates. Most breast cancers begin either in the breast tissue made up of glands for milk production called lobules or in the ducts that connect the lobules to the nipple. The remainder of the breast is made up of fatty, connective and lymphatic tissues American Cancer Society (2018).

Dollinger found that there are two kinds of breast cancer; lobular and ductual. Lobular type of cancer begins with very small cysts in the breast cancer and is less familiar than ductal cancer. Ductal cancer grows in the tubes that provide milk from the lobules to the nipple. Some cancers are limited inside the covering of the lobules and in many situations they can be healed through restricted surgery. They studied that a lump grows various years ahead cancer begins. There is a possibility that breast cancer stay in breast for a long period or can expand to adjoining lump nodes and faraway structure before ailment.

Ferrelll *et al*. (1995) gave the main idea of health related QOL of patients that is still significant in expressing the different aspects of patients around different field of wellbeing. Testa and Simonson, (1996) studied different dimensions of QOL that are firmly more valuable or helpful in health care procedure and study. Pandey *et al*. (2000) explained the long term side effects of fatigue during breast cancer treatment. In the administration of cancer disease in modern society, QOL said to have acquired a valuable position with the high survival rate. Many of the established nations have weak framework and deficiency of suitable treatments. This result in high mortality rate and therefore, give more stress on acquiring desired quantity of life than from quality. Donald gave an expressive phrase that the individual's spiritual, social and physical wellbeing define the capability to give outcome in normal routine work of livelihood.

Addington-Hall and Kalra (2001) defined the main logic behind the fast growth of QOL scope in health care in developing perception of the importance of accepting the influence about patient's livelihood alternatively on their physique. This is considered being extremely value able for patients with long term ailment, paralyzing or life menacing disease who have no option and no assurance about their treatment and faces many bad circumstances, expected to give an effect on their psychological, physical and social wellbeing. QOL estimates have been constructed to facilitate different aspects of patients about their health and some influence due to health care on lives to become easily determined and allow for analytic decision making and study. Whereas Janz *et al*. (2005) analyzed the socio demographic variables such as (age, education, cast, employment structure, income status and marital status) reshape their observed relationship and also estimate the relationship between different factors on QOL such as cancer stages, surgical treatments and chemotherapy. It was observed that women who experienced chemotherapy had lower QOL outcomes as compared to those who never experienced it on the basis of their social wellbeing, physical image and future outlook. Another study by Avis *et al*. (2005) summarized the features that are related with classification of QOL between breast cancer patients are physical activities, low body image, deficiency of social help, coping skills and all visible features of concerns like communication with doctors.

The consequences of breast cancer are not confined to a person's life. It also disturbed the structure of whole family and the real wants of children, parents and other siblings of patients. Patient's family members showed personal interest and their powerful support during the period of cancer experience. Hewitt *et al*. (2006) explained that monetary burdens also proceed to low family income and poor insurance condition. Williams *et al*. (2008) elaborated that in western countries breast cancer is the main reason of high death rate in women of middle-aged. Recently one and a half million new cases have been reported around the world. Williams *et al*. (2008) explained that breast cancer has usually diagnosed in the western women. About 3-5% women are dying due to carcinoma of breast. But in developing countries 1-3% are dying due to breast cancer. Williams *et al*. (2008) found association between age and risk of breast cancer among women. He concluded that at age of 90 or above only 20% cases of breast cancer have found. They also discussed that women who had family history of breast cancer are usually diagnosed by the disease. They described that carcinoma of breast is commonly found in nulliparous women. The term nulliparous refers a state of not given a birth. The risk of breast cancer is high in nulliparous women. If a woman gives birth to a child and breast feed to his baby then it sounds protective. The women who had late menarche or early menopause are protected from breast cancer. An overweight woman can have breast cancer due to her late menopause. This happened because of change of steroid hormones to oestradiol.

Awatef *et al*. (2010) examined the association among breast feeding and the risk of breast cancer. In a case-control study of 400 women covering the female population in Tunisia between the years of 2006 and 2009 he observed that all those women's who breastfed their child for 24 months or above has a mean length of breastfeeding per baby showed significant association with a low risk of carcinoma of breast. Those women's who had a life span of breast feeding about 73-108 months showed a significantly low risk of breast tumor and those women's who breastfed for 109 months or take a longer duration from 109 months were also at low risk of breast cancer. Stratification through menopausal

exhibited a low risk of carcinoma of breast and also associated with a long period of time of breast feeding for both pre and postmenopausal women. Bertram discussed about the improvement in the QOL of breast cancer survivor and found an association of their physical tasks with the improvement in physical wellbeing. They concluded that if a breast cancer patient makes a long term physical activities then the chances of his survival become increases and QOL also improved. A similar study was by Fassio *et al*. (2013) that relationship between QOL and individual's physical and psychological health and social structure of the society. The well being of the society was directly linked with the living style and healthy environment. The main focus of the study was paid on population density that affects QOL. For QOL the major role of population density and related factor was assessed. The effect of demographic variables and physical exertion was also included in the study. The study concluded that population density affected physical, psychological and social quality of life of an individual.

Gavric *et al*. (2016) studied the breast cancer affects on health related quality of life of breast cancer patients. The survey research was based on the EORTC QLQ-C30 Version 3.0 and questionnaire for assessment of quality of life of those suffering from breast cancer QLQ-BR23. He concluded that breast cancer affects all the domains of the quality of life, specially, emotional and social functions as well as role functions. Also, symptoms of fatigue, insomnia and pain have the most importance influence on these domains. Villar *et al*. (2017) explored that quality of life of breast cancer patients was associated with level of education and by taking anxiolytic medication those with previous pregnancies and in women with nipple retraction. They observed that QOL decreased in women with low level of education. They observed that QOL measured before and after treatment increase in the dimension of emotional function and future prospects. In turn, decrease occurred in physical function, role function, fatigue, pain, dyspnoea, financial concerns, body image, symptoms of systemic therapies and symptoms associated with the breast and arm. Also, anxiety increased in married women, women who do not work and those who take anxiolytic medication. They recommended need to reinforce care, support and information in dimensions such as emotional function, sexual enjoyment and body image should emphasized.

As the previous studied have explored the association of QOL of breast cancer patients with their chances of survival and attitude towards different medical treatments, therefore, this study was designed to check the association between different demographic variables and QOL of breast cancer patients and to identify the difference in QOL among different groups of breast cancer survivors with respect to demographic variables. The linear relationship between physical well being, psychological well being, social well being, spiritual wellbeing and Quality of Life (QOL) of breast cancer patients is analyzed and the factors affecting the quality of life of breast cancer patients are explored.

MATERIALS AND METHODS

The data was collected from the patients that were getting treatment through the oncology department and the breast cancer unit of a large hospital (INMOL) in Lahore, Pakistan during the period of November, 2016 to January, 2017 by face to face meeting and through mobile phone calls. The female patients who had completed their 1 year survivorship from age group 20-80 were included in the study. The patients were interviewed after approval of ethics committee of the hospital and after informed consent from all participants. All eligible patients were approached by their practitioner and informed about the study. If they showed consent to participate the research team provided them the questionnaires after a face to face session for guidance to fill out the questionnaire. All the patients who said "yes" from November, 2016 to January, 2017 were included in the sample. Out of 360 women 250 showed interest to participate in study.

Instrument: A modified version of the questionnaire introduced by the researchers of City of Hope National Medical Centerto measure QOL of breast cancer patients was used to collect data . This quality of life tool (breast cancer survivors version) consist of 34 questions for measuring physical, psychological, spiritual and social wellbeing of breast cancer survivors on a 10 point Liker scale. The questions regarding information of demographic variables like, area, age, income, marital status, social status, marriage age, stage of the disease, abortion having history of still birth and breast cancer and length of breast feeding period of breast cancer survivors are added. At the end two questions for measuring overall QOL of breast cancer patients were included in the constructed questionnaire. An overall reliability for constructed questionnaire was $r = 0.93$ and for different life dimensions reliability as ranged from $r = 0.71$ for spiritual wellbeing, for physical $r = 0.77$ for social $r = 0.81$ and for psychological $r = 0.89$. The overall internal consistency $r = 0.83$) after adding two items related to quality of life was sufficient.

Data analysis techniques: Analysis of Variance technique (ANOVA), Structural Equation Modeling (SEM), (Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA)) techniques were used to quantify the effects. The EFA was used to check the factor loadings of newly added items with CFA to confirm the new measurement model added in the constructed questionnaire for measuring QOL of breast cancer patients. ANOVA technique was used to find out the difference among different groups with respect toQOL of breast cancer patients across demographic variables.

RESULTS AND DISCUSSION

Summary of EFA: The EFA technique was used for data reduction and to explore the constructs that are linear function of the observed variables.The significant value of Bartlett's test 0.000<0.05 show that factor analysis is appropriate. We can conclude that correlation matrix is not an identity matrix means that variables are correlated and provides a basis for factor analysis also KMO value is 0.81>0.5 which implies that sample size is satisfactory and data reduction through factor analysis is appropriate. Using Exploratory Factor Analysis (EFA) 6 factors are retained, explaining 67.94% of the total variation.

Table 1, show summary of EFA technique, second column of the table is showing items of questionnaire that have high factor loadings on the corresponding factor. In third column an appropriate name is given to each factor related to items it contains and fourth column is showing factor loadings of each item on the corresponding factors. The table shows that every factor contains more than one item. The values ≥0.40 have taken as a criterion for a significant factor loadings (Hair *et al*. 2010). The two added questions related to QOL and one another item have significant loading on the factor QOL.

The two items were dropped due to insignificant loadings and remaining 32 items having significant loadings were compressed in 6 factors that named as physical exertion, psychological well being, social well being, spiritual well being and quality of life. In further analysis the extracted factors were used as constructs to explore effect of different dimension of the QOL of breast cancer patients.

Summary of ANOVA: Table 1 shows that there is statistically significant difference among groups of quality of life of breast cancer patients with respect to social status, marital status, income, family history of breast cancer and length of breast feeding period.

The stage of breast cancer patients and classification of QOL on the basis of number of pregnancies of breast cancer patients are significantly different at 90% confidence level but the other demographic variables of

Table 1: Factors extracted from data of breast cancer patients

Factors/List of items/Questions	Constructs	Loadings
F1		
How important to you is your participation in religious activities such as praying?	Spiritual well being	0.866
How important to you are other spiritual activities such as mediation and praying?		0.854
How much has your spiritual life changed as a result of cancer diagnosis?		0.777
To has extent has your illness made positive change in your life?		0.680
Do you sense a purpose or mission for your life or a reason for being alive?		0.536
F2		
How difficult is it for you to cope today as a result of your disease?	Psychological well being	0.563
How much happiness do you feel?		0.529
How satisfying is your life?		0.568
How is your present ability to remember things ?		0.566
How useful do you feel?		0.756
How hopeful do you feel?		0.555
F3		
Fatigue	Physical well being	0.748
Appetite change		0.619
Ache or pain		0.642
Sleep changes and nausea		0.542
Weight gain		0.497
Vaginal dryness and menopausal symptoms		0.635
Overall physical health		0.523
F4		
How good is your quality of life?	Quality of life	0.552
Do you feel like you are in control of situation in your life?		0.550
Is the amount of support you receive from others is sufficient to meet your needs?		0.593
F5		
Has your illness and treatment cause a changes in your physical appearance?	Treatment expectation	0.580
Initial diagnosis (chemotherapy, surgery, radiation)		0.642
Completion of treatment		.519
How much anxiety do you have?		0.536
Future diagnostic tests (Second cancer, recurrence of cancer, spreading of metastasizes)		0.449
Is your continuing health care interfering with your personal relationship?		0.646
F6		
Has your illness and treatment cause a changes in yourself concept (the way you see yourself)?	Social well being	0.474
To what degree has your illness and treatment interfered with your employment?		0.643
To what degree has your illness and treatment interfered with your activities at home?		0.660
How much concern do you have for your daughter or other close relatives regarding breast cancer?		0.434
How much financial burden have you been incurred as a result of your illness and treatment?		0.484

QOL as, abortion history, still births, marriage age, area and age groups have same distribution across breast cancer patients.

Summary of SEM: The NPAR value against default model shows that there are total 109 parameters to be estimated through the model but many paths have dropped. The value of is 1267.401 with 485° of freedom and CMIN/DF (normed Chi square) is 2.613. The incremental indices CFI, NFI, TFI, TLI of the model reports the values 0.668, 0.565, 0.497 and 0.616 that are near to 1, indicate an adequate fit. The value of RMSEA is 0.07 which indicates a good fit of the model.

Table 1 demonstrates that Spiritual Well Being (S_W_B_1) is correlated with Physical Exertion (P_E_1), Psychological Well Being (P_S_W_B_1) and Treatment Expectations (T_E_1) but is uncorrelated with Social Well Being (SO_W_B_1). On QOL of breast cancer patients the effect of different dimensions of breast cancer patients were measured through multiple regression model. The results of Table 1 illustrates that psychological well being, physical well being, spiritual well being and treatment expectations have significant effect ($p<0.05$) on QOL of breast cancer patient.

This study focus to check the association of different demographic variables and personality traits with QOL of breast cancer patients and also to identify difference among groups of quality of life of breast cancer survivors with respect to different demographic variables. The effect of different factors, physical, psychological, social and spiritual wellbeing on Quality of Life (QOL) of breast cancer patients has investigated also. Income and social status are found to be associated with QOL but marital status is not statistically significantly associated with QOL of breast cancer patients while it has concluded from previous researchers that QOL and marital status is associated because breast cancer patients without partner has worst QOL as investigated by Avis *et al*. (2005). The difference among groups of QOL of breast cancer patients with respect to number of pregnancies was founds insignificant in this study but has been reported significantly different in the previous studies. The QOL of patients having different stages of diseases are found to be significantly different.

The results of the study show that there exist a significant linear relationship between physical exertion and QOL that is supported by Meeske *et al*. (2007) that physical exertion affects the QOL of breast cancer patients. For psychological wellbeing and QOL there exist a positive linear relationship among them. Study done by Oudsten *et al*. (2009) supported our research that psychological health contributes to overall QOL at all time and has positive linear relationship. From our findings it has been concluded that social well being has not any effect on QOL of breast cancer patients means social well being does not contributes in improving QOL of breast cancer survivors. It may concluded from this research that breast cancer patients having spiritual satisfaction and strong faith are enjoying good QOL as the positive relationship between spiritual well being and QOL of breast cancer patients exists Ringdal (1996) has described that spirituality has relation with internal satisfaction or overall QOL that is verified by this research. The treatment expectations have also significant effect on QOL of breast cancer patients.

CONCLUSION

The breast cancer patients who are more optimistic about their treatment results are enjoying better quality of life. As mentioned earlier that breast cancer is directly associated with QOL, therefore, it is very important to know the factors having effect on QOL of breast cancer patients. The results of this research may be helpful to know about different demographic, social and personal factors that affect QOL of breast cancer patients and should consider for improving QOL of breast cancer patients.

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