



# Examining the quality of life of patients living with breast cancer in Southern Sri Lanka: A descriptive cross-sectional study

## Research Paper

Eranthi Weeratunga<sup>1</sup>, Chandanie Senadheera<sup>2</sup>, Manjula Hettiarachchi<sup>3</sup>, Bilesha Perera<sup>4</sup>

<sup>1</sup>Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka; <sup>2</sup>Department of Psychiatry, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka; <sup>3</sup>Nuclear Medicine Unit, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka; <sup>4</sup>Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka

**Corresponding author:** E. Weeratunga (eranthiw@ahs.ruh.ac.lk)

## ABSTRACT

**Introduction:** Globally breast cancer (BC) is the most common cancer among women and Sri Lanka is not an exception. Cancer influences the quality of life (QoL) of cancer patients. The survival rates and the QoL of BC patients have improved significantly over the last few decades. However, factors associated with the QoL of patients with BC have not been well studied in Sri Lanka. The aim of the study was to assess the QoL and its correlates among patients with BC treated at a tertiary care hospital in Southern Sri Lanka. **Methods:** Ninety-seven BC patients were investigated using an interviewer-administered questionnaire. The World Health Organization- Quality of Life- Brief (WHOQOL-BREF) was used to measure QoL. The WHOQOL-BREF measure QoL in four domains: physical, psychological, social, and environmental. Scores range from 0 to 100, and higher scores indicate a greater QoL. **Results:** The mean age of the sample subjects was 52 years (SD = 8.7), and the majority were married (78%). Physical (60.97±11.56), psychological (63.52±11.63), and environmental (69.05 ±8.79) domains of QoL were at a satisfactory level whereas QoL score related to social relationships was found to be low (47.86±13.89) in this sample. Physical QoL was higher in young participants and psychological QoL was higher among those with a fewer number of comorbidities and disabilities and those with no body image changes. Social QoL was higher among married and environmental QoL was higher among those who reported having no disabilities. **Conclusion:** Social support in the form of family support and emotional support seems to play a major role in lowering the QoL of BC patients. Psycho-social support services should target patients experiencing physical disabilities, a higher number of comorbidities, and those who were subjected to changes in their body image.

## KEYWORDS

Breast Cancer; Developing Countries; Support Services; Quality of Life

## INTRODUCTION

Cancer is a global health problem. Breast cancer (BC) ranks first among cancers experienced by women (GLOBOCAN/World, 2020). But it can have a good prognosis if it is diagnosed in its early stages (Handbook/Brest cancer, 2021, pp.1-6). Basically, abnormal uncontrollable growth of a group of cells in the glands or ducts will result in breast cancer. Being a female is the most vital risk factor for being a breast

cancer patient. Other risk factors include advanced age, exposure to a chemical (e.g., benzene) or a physical agent (e.g., radiation), a defective gene, or an impact of hormones (Handbook/Brest cancer, 2021, pp. 1-6).

In 2020, globally there were 11.7% (2,261,419) BC patients out of the total cancer patients and 6.9%



(684, 996) deaths were from BC patients out of all cancer deaths. Globally the incidence of BC was 47.8/per 100,000 women per year with a mortality rate of 13.6/per 100,000, which is the highest incidence recorded in different types of cancer and ranks second in mortality rates (GLOBOCAN/World, 2020).

BC trends in Sri Lanka are like that of developed countries and BC was the leading type of cancer in Sri Lankan women according to the National Cancer Control Programme data (NCCP) (2020); it ranks the first in new cases 3,975 (13.4%) and several deaths 1,682 (10.1%) (GLOBOCAN/Sri Lanka, 2020). The incidence of BC in Sri Lanka was 27.3/per 100,000 women per year with a mortality rate of 11/per 100,000, which is lower than the global rates. According to the NCCP/Sri Lanka, the age-standardized incidence rate of BC was 18.4/100,00 in the year 2005 and it has risen to 33.5/100,000 in the year 2019 (NCCP, 2020; National Cancer Incidence and Mortality Data, 2015). According to published data from National Cancer Institute in Sri Lanka from 2016 to 2019, a higher percentage of women who were in the age range of 50-59 were diagnosed with BC (28.2%) (Seneviratne, 2020).

Health-related quality of life was defined as patients' perception of their physical, mental, and social health that is influenced by diagnosis, treatment, post-treatment, and survivorship (Mokhatri-Hesari & Montazeri, 2020). The QoL is concerned as an important indicator in the treatment outcome of patients with cancer. Improvement of QoL has been identified as one of the goals in healthcare for people living with BC. BC patients tend to live longer today than in the past and their concerns about QoL have increased (Cui, Wang & Wang, 2021; Edib et al., 2016; Yusoff et al., 2022). In recent years, there has been an increasing trend of reporting QoL in BC research (Cui, Wang & Wang, 2021; Edib et al., 2016; Finck et al., 2018; Yusoff et al., 2022).

QoL of BC patients has improved in recent years due to the advancement in treatment and psychological interventions (Mokhatri-Hesari & Montazeri, 2020). Cancer and its treatments frequently cause physical and mental disorders in patients. The leading problems of cancer patients are stress, depressive symptoms, anxiety, hopelessness,

fear, sadness, and aggression (Alagazy, Soltan & Soliman, 2020; Dehghan et al., 2020; Handbook/Brest cancer, 2021, p.1-6; Prabath & Ruban, 2020; Weeratunga, Senadheera & Ekanayake, 2016; Weeratunga et al., 2019; Weeratunga et al., 2021; Yan, Chen & Li, 2019; Yuan, Pan & Wang, 2020). Not only cancer, its related factors such as social activities, different coping strategies (Finck et al., 2018; Weeratunga et al. 2022), work, and childcare also affect the QoL (Yusoff et al., 2022). QoL contains all aspects of life experiences, illnesses, and treatment. The QoL of BC patients changes over time and the poor QoL of chronic patients is the consequence of different physical and psychological problems they must face during their treatment and recovery period (Dehghan et al., 2020; Yusoff et al., 2022).

There are several factors such as socio-demographic, clinical, treatment-related, behavioural, and psycho-social that individually or collectively impact the QoL of cancer patients. Women with BC experience physical (e.g. – disabilities, fatigue, body image, loss of hair, loss of a breast, dyspnea, etc.), psychological (e.g.-perceived stress, mindfulness, depressive symptoms, etc.), social problems (e.g. – age, family support, work, childcare, education level, marital status, income, social support, coping, optimism, etc.), and cancer-related factors (e.g.- treatment types, comorbidities, cancer types, cancer stage, etc.) that can lead to a decrease in their QoL (Adamowic & Waliszewska, 2020; Cui, Wang & Wang, 2021; Edib et al., 2016; Shin et al., 2017; Tang et al., 2017; Yeo et al., 2020; Yusoff et al., 2022). Understanding the factors that affect the QoL of women with BC is important for the development of strategists to improve outcomes.

## STUDY PURPOSE

Few studies have been conducted to measure the outcomes of cancer care in Sri Lanka (Jayasekara, Rajapaksha & Aaronson, 2009; Jayasekara, Rajapaksha & Brandberg, 2008; Weeratunga, Senadheera & Ekanayake, 2016; Weeratunga et al., 2019; Weeratunga et al., 2021; Weeratunga et al., 2022). Cancer care resource limitations, increasing cost of treatments, and inadequate psychological facilities available for the high demand have adversely affected cancer care management system in the country creating adversities for cancer patients (National Cancer Incidence and Mortality Data Sri



Lanka, 2015; Jayasekara, Rajapaksha & Brandberg, 2008). The purpose of this study was to assess the QoL and its correlates among BC patients who had obtained treatment from the Teaching Hospital, Karapitiya (THK), Galle in Southern Sri Lanka.

## **METHODS**

### ***Study Design and Participants***

This cross-sectional study was conducted at the cancer unit, THK in Sri Lanka. The THK is the only teaching hospital in Southern Sri Lanka and provides health services using many specialties including oncology. Ninety-seven out of 400 cancer patients were breast cancer and were assessed for their QoL. BC patients were selected for the study because they satisfy the following conditions: having confirmed diagnoses as a BC patient; being able to understand the Sinhala language and being able to provide informed consent with sufficient physical and mental stability. Subjects with any surgical problems other than cancer-related and in a critical state/end-stage of medical condition were excluded.

### ***Instruments***

An interviewer-administered questionnaire (IAQ) was used to obtain socio-demographic characteristics of the participants such as age, gender, educational level, and marital status. The WHOQOL-BREF was also included in the IAQ. The IAQ questions were close-ended; after preparing this IAQ, pre-testing was done using ten BC patients who were excluded from the final analysis.

The World Health Organization – Quality of Life-BREF questionnaire (WHOQOL- BREF) was used to assess the QoL. This is a 26-item scale comprised of four domains of self-perceived QoL (WHOQOL, 1988). Twenty-four items of the scale were used to measure physical QoL (7 items), psychological QoL (6 items), social QoL (3 items), and environmental QoL (8 items). Two other items were used to measure overall QoL and overall satisfaction with health (Agnihotri et al. 2010). Each item has five responses that were rated on a Likert scale of 1-5. Higher scores indicate a higher level of self-perceived QoL. The scale has been validated in Sri Lanka and has been used in health research (Kumarapeli, Seneviratne & Wijeyaratne, 2006; Kumarapeli, Seneviratne & Wijeyaratne, 2011).

### ***Data Collection***

Data collection was done using an IAQ, bed head tickets, and the diagnosis cards of the corresponding participants. The participants were enrolled in the cancer unit at the THK during the year 2017-2018. Eligible participants were identified using medical records and were recruited using a ‘first-come-first-serve basis’. On the day of the data collection, the PI contacted them to explain the aim of the study, and those who had given consent were surveyed after obtaining written informed consent. To maintain confidentiality, each participant was offered a code known only to the PI. The questionnaire took approximately 10-15 minutes to complete.

### ***Data Analysis***

Data analysis was done using the Statistical Package of Social Science (version 20.0). Frequency distributions and basic descriptive statistics were used to describe the study sample. An independent t-test and one-way ANOVA were used as appropriate to establish the differences in QoL scores across socio-demographic and clinical characteristics. The level of statistically significant was set at  $p < 0.05$ .

### ***Ethical Considerations***

Ethical approval for the study was obtained from the Ethics Review Committee, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka. In addition, permission was obtained from the Director of THK and relevant consultants in the cancer unit. Before the data collection, we informed the participants about the study purpose, the risks, and benefits of participating in this research, the principles of voluntary participation, and their right to withdraw or refuse to participate in the study at any time without any penalties. They were also informed that the data collected would be used for research purposes only. Written informed consent from all participants were obtained before the interviews.

## **RESULTS**

### ***Sociodemographic and Clinical Characteristics of Study Participants***



Our study sample consisted of 97 women with breast cancer, and the mean age was  $52.39 \pm 8.72$  years (range 31-71 years). Most of the patients were married (78%), studied up to Advanced Level examination (82%), and unemployed (62%). A summary of the participants' socio-demographic and clinical characteristics is provided in [Table 1](#).

Nearly 84% of patients had local cancer at the time of the diagnosis (T stage – localized tumor) and 16% were in the severe stage (node and metastasis). Fifty-seven patients (59%) had been diagnosed in the previous 12 months; others were diagnosed for more than 1 year period at the time of data collection.

### ***Descriptive Statistics of Different Domains of QoL***

The total scores and sub-scale/domain scores of QoL are given in [Table 2](#). Physical, psychological, and environmental QoL was at a moderate level whereas low QoL was found to be in the social relationship domain ( $47.86 \pm 13.89$ ). Overall, a moderate level of QoL was observed in this sample.

### ***Correlates of participants' QoL***

Associations between socio-demographic and other clinical characteristics and QoL domains are presented in [Table 3](#). Age, marital status, past medical/surgical history (comorbidities), self-reported disabilities, and body image changes due to the cancer or cancer treatment seem to influence several QoL domains as shown in [Table 3](#). The level of income, time since diagnosis, stage of cancer, and current treatment were not related to the QoL of the participants.

Physical QoL was significantly higher among BC patients in advanced age than that of others. Psychological QoL was significantly higher among patients who had past surgical history, who had no self-reported disabilities, and who had not experienced any body changes due to cancer or treatment. Married BC patients had significantly higher social QoL. Further, environmental QoL was higher among those patients who had no self-reported disabilities compared to others. A moderate level of total QoL was observed across all categories of BC patients.

## **DISCUSSION**

In the present study, we investigated the QoL and its correlates in patients with BC in Sri Lanka. The participants, in general, had a moderate level of total QoL. Advanced age, unmarried status, having a history of medical/surgical comorbidities, having changes in body image due to cancer or treatment (e.g.- loss of breast and hair, scars on the body, lymphoedema, skin, and weight changes), and having disabilities were found to be the risk factors of having low QoL in BC patients.

There were no population norms to analyze the total score of WHOQOL-BREF. Also, different studies have used different QoL measures to assess the QoL of BC patients globally. Comparisons are made difficult due to these reasons, but studies conducted in other countries have suggested similar or contradictory findings. A moderate level of total QoL was reported in some countries such as Iran and India as observed in the current study (Kiadaliri, Bastani & Ibrahimipour, 2012; Muthanna, Khairkar & Hurtig, 2017). BC patients in some countries like Canada, Saudi Arabia, Pakistan, Korea, and Malaysia had reported higher total QoL (Arneja & Brooks, 2021; Imran et al., 2019; Muthanna et al., 2021; Park J-H et al., 2021; Yusoff et al., 2022) whereas a lower level of total QoL was found among certain BC patients in China and Colombia (Ban et al., 2021; Cui, Wang & Wang, 2021; Finck et al., 2018). In our study, the observed low level of social QoL has greatly contributed to lowering the total QoL to a moderate level.

According to the study findings, a high total QoL was reported by the younger age group ( $\leq 50$  years) and our result is consistent with some studies done in Malaysia, Saudi Arabia, Korea, and China (Edib et al., 2016; Imanan et al., 2019; Park J-H et al. 2021; Yan et al., 2016; Yusoff et al., 2022). Further, BC patients who were married (Ban et al., 2021; Cui, Wang & Wang, 2021; Muthanna, Khairkar & Hurtig, 2017; Yusoff et al., 2022) and patients with tumor stage (Ban et al., 2021; Edib et al., 2016; Muthanna, Khairkar & Hurtig, 2017, Park J-H et al., 2021; Yusoff et al., 2022) had shown a higher total QoL than their counter partners.

Younger age was found to be a protective factor of having a low QoL and this could be due to higher physical strength, less physical complaints, physical flexibility, and speedy recovery in patients in this



group. A larger capacity for recovery at a younger age may need less time for adjustment to the disease whereas older adults may need more time for the adjustment to the disease and recovery (Edib et al., 2016; Park J-H et al., 2021; Yusoff et al., 2022). However, few studies conducted in India and in Malaysia showed that BC patients at younger ages tend to have a lower QoL (Muthanna, Khairkar & Hurtig, 2017; Yusoff et al., 2022). Better emotional and social functioning were reported by 50 years of age and older group than the younger patients in a study conducted in Saudi Arabia (Imran et al., 2019). A study conducted in Iran found that young age is a risk factor for BC patients who had poor HRQoL than the older age group (Kiadaliri, Bastani & Ibrahimipour, 2012). Lower adjustment, unbearable treatment, less coping, and experience of severe distress in younger BC patients and better social and emotional functioning in older adults seemed to cause an enhanced QoL among older adults than in the younger age group.

Married BC patients had significantly higher social QoL in this study as has been reported in some other countries (Muthanna, Khairkar & Hurtig, 2017). Similarly, psychological, and environmental QoL were high in married BC patients than in unmarried BC patients possibly due to the strong relationship that they have with their partners in accordance with the culture and traditions of Sri Lanka. Physical QoL was lower among married BC patients as some of them were in older ages and were on treatments, and had comorbidities, self-reported disability, and body image changes due to cancer or treatment. But in some studies, conducted in China and Malaysia, no significant association was reported between marital status and domains of QoL (Cui, Wang & Wang, 2021; Yusoff et al., 2022). Married BC persons were reported to have lower QoL in a study conducted in Iran (Kiadaliri, Bastani & Ibrahimipour, 2012) probably due to the role changes and performances of women in a family. Partner relationships and sexual dysfunctions have an influence on QoL scores (Kiadaliri, Bastani & Ibrahimipour, 2012) in BC patients. Patients who had many unmarried children in their families seemed to be affected more (Cui, Wang & Wang, 2021). In contrast to our findings, unmarried BC patients reported significantly higher QoL than married and divorced patients in Malaysia (Edib et al., 2016) and in China (Tang et al., 2017).

Both who had medical and surgical comorbidities (past medical/surgical history) were found to be having lower psychological QoL. Long-term comorbidities and cancer itself affect psychological well-being and would result in lower QoL. Research conducted in Iran and the United States (US) showed that comorbid conditions can have a negative impact on the QoL (Kiadaliri, Bastani & Ibrahimipour, 2012; Park J et al., 2021; Wu, Davis & Chen, 2019). In a US study, having more comorbid conditions increase pain and reduce sleep quality, lesser physical and role functioning, and worse fatigue, dyspnea, appetite loss, and nausea and vomiting (Wu, Davis & Chen, 2019).

BC patients who did not have any self-reported disabilities were found to have a better psychological and environmental QoL as assumed. Physical and social QoL also was higher among non-disabled as expected. If patients had any disabilities, they had to face difficulties when doing daily activities. Further, other relationship issues caused social isolation and having to depend on others. Finally, all changes could be impacted psychologically. These reasons may affect adversely and tend to reduce QoL in all domains.

Body image changes due to cancer or treatment (e.g.- loss of a breast, loss of hair, scars on the body, lymphoedema, skin, and weight changes) affect in a similar way to that of self-reported disabilities and showed a significant impact on psychological QoL. Patients who did not have any body image changes scored higher values for all QoL domains as expected. Due to cancer, surgical interventions, treatment modalities, side effects, and disabilities, body changes or alterations could occur in the body. Women who received chemotherapy described greater physical and sexual difficulties than that of other BC patients in some selected European countries (Ruggeri et al., 2019). In a review study, surgery type, disease process, and treatment type interfered with the body image/physical appearance of BC patients causing distress among them (Rezaei et al., 2016). Body image changes in Ghana BC participants included hair loss, absence of the breast that was problematic by the inaccessibility of breast prosthesis, the incidence of lymphoedema, and skin changes (Iddrisu, Aziato & Dede, 2020).



None of the other socio-demographic and clinical variables (income level, cancer stage, time since diagnosis, and current treatment) were significantly correlated with the scores of QoL. Although the income level was not significant, lower QoL scores in all domains among BC patients who earned low income were observed in this study. BC patients who did not have a proper way of income suffer from all needs of them, and their family's needs. This situation would impact their QoL. If patients had a permanent income, QoL could be improved in many ways. As consistent with current findings, women who had lower income reported lower total QoL than the high-income group in Malaysia (Edib et al., 2016). Although we did not investigate employment status which is directly related to income, employment was not significantly associated with QoL domains in a study conducted among BC patients in Iran (Kiadaliri, Bastani & Ibrahimipour, 2012) whereas a significant higher QoL by the confirmed/well-organized/government or private job holders was reported in China (Yan et al., 2016). Unemployed and retired BC patients in China remarkably showed a better QoL than employed persons (Tang et al., 2017). In contrast, well-reputed job owners in China reported high QoL (Yan et al., 2016). In Sri Lanka per-capita income is low. Thus, economic stability is a vital factor that needs to be considered in programs targeted at improving the QoL of BC patients.

The present study has no evidence of any significant association between the stage of cancer and QoL in contrast to studies conducted in China (Ban et al., 2021; Cui, Wang & Wang, 2021; Tang et al., 2017). Node and metastasis were considered severe stages and BC patients with those conditions reported having low physical and environmental QoL than those with the tumor stage. If BC patients were in severe stages, they may have many more ailments than the tumor stage and it would cause to have a lower QoL (Edib et al., 2016; Park J-H et al., 2021). In China, the advanced stage was impacted to increase physical and psychological distress which negatively influenced the QoL of BC patients (Yeo et al., 2020).

Time since diagnosis did not show a significant impact on QoL scores in the present study. If BC patients could get a correct diagnosis during a short period, then the patient could start treatment which facilitate them to have a higher QoL. BC patients must face many bad outcomes due to delays in

reporting/presentation, diagnosis, and treatment. Studies conducted in China and Malaysia revealed that a short time since diagnosis could cause to have higher QoL (Cui, Wang & Wang, 2021; Yusoff et al., 2022). Edib et al (2016) showed that BC patients in Malaysia who had been diagnosed for more than 5 years scored significantly higher QoL than others. However, In Iran BC patients with a short duration of time since diagnosis had a lower QoL in contrast to our findings (Kiadaliri, Bastani & Ibrahimipour, 2012).

Treatment modalities such as surgery, chemotherapy, and radiotherapy influence the health and QoL of BC patients. The type of treatment or current treatment did not significantly influence the QoL of BC patients who participated in this study. In China, a higher QoL was observed for BC patients who were on other treatment methods compared to patients who were on chemotherapy or radiotherapy (Tang et al., 2017). Side effects associated with chemotherapy and radiotherapy would be the reason for this observation. Also, patients who had done breast-conserving surgery had significantly higher QoL than those who did mastectomy. In Malaysia, BC patients who had radiotherapy reported a low QoL than the patients who did not face radiotherapy treatment (Edib et al., 2016).

In contrast, chemotherapy, radiotherapy, hormone therapy, and surgery had not had any significant impact on QoL in BC patient in Colombia (Finck et al., 2018). Also, no effect of chemotherapy was found on the overall QoL of BC patients in Poland (Adamowic and Waliszewska, 2020), and they further demonstrated that hormone therapy and trastuzumab therapy had increased the QoL of the treated patients in clinical practice. Studies conducted in Malaysia and Korea on BC patients showed that those who did not receive chemotherapy/radiotherapy were more likely to have higher QoL (Edib et al., 2016; Park J-H et al., 2021). Further, severe menopausal symptoms experienced by some BC patients in China (who used adjuvant chemotherapy) had reported the worst breast cancer specific QoL (Yeo et al., 2020).

Shin et al. (2017) studied the physical activity and QoL of BC patients in Korea. An increase in physical activity would reduce fatigue and pain and has increased sexual functioning causing to increase in QoL. Physical activity is vital to have physical fitness



which would improve physical QoL. Tang et al. (2017) studied the impact of psychological variables on the QoL of BC patients in China. Depression, anxiety, health-related anxiety, dysfunctional illness perception, and sense of coherence would adversely affect the psychological well-being of BC patients. (Weeratunga, Senadheera & Ekanayake, 2016; Weeratunga et al., 2021) and it is important to provide psychological care services for BC patients to improve their QoL.

### LIMITATIONS

This study had several limitations. The research was conducted using a relatively small sample of BC patients and they were selected from a tertiary care hospital located in Southern Sri Lanka. It would be better if we were able to collect data on several potentially important correlates of QoL such as treatment cost. Response bias due to social desirability may also be a possible limitation.

### CONCLUSION

Our observation that the QoL of patients with BC was moderate is a good sign of the overall quality of services provided by the government for this target group. Socio-cultural support available for BC patients should be improved to enhance their QoL. Age, marital status, past medical/surgical history, self-reported disabilities, and body image changes were a vital component that needs to be considered in psychological support services targeted at this population group.

Future studies should explore the possible psychosocial factors in Sri Lankan BC patients, using both quantitative and qualitative methods using a larger sample of BC patients in different clinical settings. Longitudinal studies are warranted for the examination of causative factors of QoL of BC patients.

### ACKNOWLEDGEMENT

The authors wish to thank all study participants and collaborators of this study for their valuable time, contribution, and dedication to this study (former Consultant Oncologist, Dr. Upul Ekanayake, and administrative staff and healthcare professionals of Teaching Hospital, Karapitiya, Galle, Sri Lanka). The

Faculty Research Grant, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka was further acknowledged.

### REFERENCES

- Adamowicz, Z., & Waliszewska, B. (2020). Quality of life during chemotherapy, hormonotherapy or antiHER2 therapy of patients with advanced, metastatic breast cancer in clinical practice. *Health and Quality of Life Outcomes*, 18,134. <https://doi.org/10.1186/s12955-020-01389-x>
- Agnihotri, K., Awasthi, S., Chandra, H., Singh, U., Thakur, S. (2010). Validation of WHO QOL-BREF instrument in Indian adolescents. *Indian Journal of Pediatrics*, 77, 381–386. <https://doi.org/10.1007/s12098-010-0041-1>
- Alagazy, H. A., Soltan, M. R., & Soliman, S. S. (2020). Anxiety, depression and perceived stress among breast cancer patients: single institute experience. *Middle East Current Psychiatry*, 27(29), 1-10. <https://mecp.springeropen.com/articles/10.1186/s43045-020-00036-x>
- Arneja, J., & Brooks, J. D. (2021). The impact of chronic comorbidities at the time of breast cancer diagnosis on quality of life, and emotional health following treatment in Canada. *PLoS one*, 16(8), e0256536. <https://doi.org/10.1371/journal.pone.0256536>
- Ban, Y., Li, M., Yu, M., Wu, H. (2021). The effect of fear of progression on quality of life among breast cancer patients: the mediating role of social support. *Health and Quality of Life Outcomes*, 19:178. <https://doi.org/10.1186/s12955-021-01816-7>
- Cui, C., Wang, L., & Wang, X. (2021). Health-related quality of life and social constraints among Chinese breast cancer patients: a cross-sectional study. *Health and Quality of Life Outcomes*, 19, 238. <https://doi.org/10.1186/s12955-021-01871-0>
- Dehghan, M., Jazinizade, M., Malakoutikhah, M., Madadimahani, A., Iranmanesh, M. H., Oghabian, S., et al. (2020). Stress and Quality of Life of Patients with Cancer: The



- Mediating Role of Mindfulness. *Journal of Oncology*, 1-10. <https://doi.org/10.1155/2020/3289521>
- Edib, Z., Kumarasamy, V., Abdullah, N. B., Rizal, A. M., Dubai, S. A. (2016). Most prevalent unmet supportive care needs and quality of life of breast cancer patients in a tertiary hospital in Malaysia. *Health and Quality of Life Outcomes*, 14, 26. <https://doi.org/10.1186/s12955-016-0428-4>
- Finck, C., Barradas, S., Zenger, M., Hinz, A. (2018). Quality of life in breast cancer patients: Associations with optimism and social support. *International Journal of Clinical and Health Psychology*, 18, 27-34. <https://doi.org/10.1016/j.ijchp.2017.11.002>
- GLOBOCAN. (2020). *Sri Lanka*. Retrieved from: <https://gco.iarc.fr/today/data/factsheets/populations/144-sri-lanka-fact-sheets.pdf>
- GLOBOCAN. (2020). *World*. Retrieved from: <https://www.uicc.org/news/globocan-2020-new-global-cancer-data>
- Handbook on Comprehensive Breast Cancer Care for Healthcare Workers. (2021). *Know about Breast Cancer: Prevent, Diagnose, Treat & Care*. The National Cancer Control Programme, Ministry of Health, Sri Lanka. Retrieved from: <https://www.nccp.health.gov.lk/storage/post/pdfs/Comprehensive%20breast%20care%20book%20new%202021%20new%2003-18.pdf>
- Iddrisu, M., Aziato, L., & Dedey, F. (2020). Psychological and physical effects of breast cancer diagnosis and treatment on young Ghanaian women: A qualitative study. *BMC Psychiatry*, 353. <https://doi.org/10.1186/s12888-020-02760-4>
- Imran, M., Al-Wassia, R., Alkhayat, S. S., Baig, M., Al-Saati, B. A. (2019). Assessment of quality of life (QoL) in breast cancer patients by using EORTC QLQ-C30 and BR-23 questionnaires: A tertiary care center survey in the western region of Saudi Arabia. *PloS one*, 14(7), e0219093. <https://doi.org/10.1371/journal.pone.0219093>
- Jayasekara, H., Rajapaksha, L., & Aaronson, N. K. (2009). Health related quality of life in patients with head-and-neck cancer in Sri Lanka: psychometric properties of the 'Sinhala' version of the EORTC QLQ- H&N35. *Psycho Oncology*, 18, 1116-1121.
- Jayasekara, H., Rajapaksha, L.C., & Brandberg, Y. (2008). Measuring breast cancer –specific health- related quality of life in South Asia: psychometric properties of the Sinhala version of the EORTC QLQ- BR23. *Quality of Life Research*, 17(6), 927-932.
- Kiadaliri, A. A., Bastani, P., & Ibrahimipour, H. (2012). Health-related quality of life of breast cancer patients in Iran: pooled analysis using generalized estimating equations. *Asian Pacific Journal of Cancer Prevention*, 13, 941-944.
- Kumarapeli, V., Seneviratne, R. A., & Wijeyaratne, C. N. (2006). Validation of WHOQOL-BREF to measure quality of life among women with polycystic ovary syndrome (PCOS). *Sri Lanka Journal Collage of Community Physicians*, 11, 01-10.
- Kumarapeli, V., Seneviratne, R. A., & Wijeyaratne, C. N. (2011). Health-related quality of life and psychological distress in polycystic ovary syndrome: a hidden facet in South Asian women. *International Journal of Obstetrics and Gynaecology*, 118, 319-328.
- Mokhatri-Hesari, P., & Montazeri, A. (2020). Health-related quality of life in breast cancer patients: review of reviews from 2008 to 2018. *Health and Quality of Life Outcomes*, 18, 338. <https://doi.org/10.1186/s12955-020-01591>
- Muthanna, F. M., Karuppanan, M., Hassan, B. A., Mohammed, A. H. (2021). Impact of fatigue on quality of life among breast cancer patients receiving chemotherapy. *Osong Public Health and Research Perspectives*, 12(2), 115-125. <https://doi.org/10.24171/j.phrp.2021.12.2.09>
- Muthanna, N., Khairkar, P., Hurtig, A. K., Sebastián, M. S. (2017). Quality of Life Determinants in Breast Cancer Patients in Central Rural India. *Asian Pacific Journal of Cancer Prevention*, 18 (12), 3325-3332. <https://doi.org/10.22034/APJCP.2017.18.12.3325>
- National Cancer Control Programme. (2020). *Annual Report- Ministry of Health, Sri Lanka*.





- Retrieved from:  
<https://www.nccp.health.gov.lk/storage/post/pdfs/Annual%20report%202020%20E%20version.pdf>
- National Cancer Incidence and Mortality Data Sri Lanka. (2015). *National Cancer Control Programme*, Ministry of Health. Retrieved from:  
[https://www.nccp.health.gov.lk/storage/post/pdfs/2015%20Cancer%20Registry%20%20T%20o%20Email%20Only\\_compressed%20\(1\).pdf](https://www.nccp.health.gov.lk/storage/post/pdfs/2015%20Cancer%20Registry%20%20T%20o%20Email%20Only_compressed%20(1).pdf)
- Park, J-H., Jung, Y. S., Kim, J. Y., Bae, S. H. (2021). Determinants of quality of life in women immediately following the completion of primary treatment of breast cancer: A cross-sectional study, *PLoS one*, 16(10), e0258447. <https://doi.org/10.1371/journal.pone.0258447>
- Park, J., Rodriguez, J. L., O'Brien, K. M., Nichols, H. B., Hodgson, M. E., Weinberg, C. R., et al. (2021). Health-related quality of life outcomes among breast cancer survivors. *Cancer*, 127(7), 1114-1125. <https://doi.org/10.1002/cncr.33348>
- Prabhath, T. A., & Ruban, R. (2020). The prevalence and correlates of depression among patients with breast cancer, attending outpatient clinics at two cancer units in Sri Lanka. *Sri Lanka Journal of Psychiatry*, 11(2), 13-19. <http://doi.org/10.4038/sljpsyc.v11i2.8274>
- Rezaei, M., Elyasi, F., Janbabai, G., Moosazadeh, M., Hamzehgardeshi, Z. (2016). Factors Influencing Body Image in Women with Breast Cancer: A Comprehensive Literature Review. *Iranian Red Crescent Medical Journal*, 18(10), e39465. <https://doi.org/10.5812/ircmj.39465>
- Ruggeri, M., Pagan, E., Bagnardi, V., Bianco, N., Gallerani, E., Buser, K., et al. (2019). Fertility concerns, preservation strategies and quality of life in young women with breast cancer: Baseline results from an ongoing prospective cohort study in selected European Centers. *Breast*, 47, 85-92. <https://doi.org/10.1016/j.breast.2019.07.001>
- Seneviratne, S. (2020). Cancer in Sri Lanka; trends, care, and outcomes. *The Sri Lanka Journal of Surgery*, 38(3), 01-12. <http://doi.org/10.4038/sljs.v38i3.8772>
- Shin, W. K., Song, S., Jung, S.Y., Lee, E., Kim, Z., Moon, H. G., et al. (2017). The association between physical activity and health-related quality of life among breast cancer survivors. *Health and Quality of Life Outcomes*, 15,132. <https://doi.org/10.1186/s12955-017-0706-9>
- Sri Lanka Cancer Registry. (2019). *National Cancer Incidence and Mortality Data*. National Cancer Control Programme: 2019. Sri Lanka. Retrieved from:  
[https://www.nccp.health.gov.lk/storage/post/pdfs/Cancer%20Incidence%20Data%20Book-2019\\_compressed.pdf](https://www.nccp.health.gov.lk/storage/post/pdfs/Cancer%20Incidence%20Data%20Book-2019_compressed.pdf)
- Tang, L., Fritzsche, K., Leonhart, R., Pang, Y., Li, J., Song, L., Fischer, I., et al. (2017). Emotional distress and dysfunctional illness perception are associated with low mental and physical quality of life in Chinese breast cancer patients. *Health and Quality of Life Outcomes*, 15, 231. <https://doi.org/10.1186/s12955-017-0803-9>
- Weeratunga, E., Senadheera, C., Hettiarchichi, M., Perera, B. (2022). Validation of the Sinhalese Version of Brief COPE Scale for patients with cancer in Sri Lanka. *BMC Psychology*, 10, 157. <https://doi.org/10.1186/s40359-022-00863-z>
- Weeratunga, E., Senadheera, C., Hettiarchichi, M., Ekanayaka, U., Perera, B. (2019). Psychosocial factors associated with quality of life of patients with cancer in southern Sri Lanka. Faculty of Allied Health Sciences, University of Ruhuna. Proceedings of 2<sup>nd</sup> Annual Research Conference, 30-41. [https://www.researchgate.net/publication/338164108\\_Psychosocial\\_Factors\\_Associated\\_with\\_Quality\\_of\\_Life\\_of\\_Patients\\_with\\_Cancer\\_in\\_Southern\\_Sri\\_Lanka](https://www.researchgate.net/publication/338164108_Psychosocial_Factors_Associated_with_Quality_of_Life_of_Patients_with_Cancer_in_Southern_Sri_Lanka)
- Weeratunga, E. B., Senadheera, C., & Ekanayake, U. (2016). Psychological distress in cancer patients in Southern province of Sri Lanka. *The Galle Medical Journal*, 21(2), 1-7. <https://gmj.sljol.info/articles/abstract/10.4038/gmj.v21i2.7951/>
- Weeratunga, E. B., Senadheera, C., Hettiarchichi, M., Perera, B. (2021). The prevalence and correlates of depressive symptoms in patients with cancer treated in a Tertiary health care facility in Southern Sri Lanka. *International Journal of Multidisciplinary Studies*, 8(2), 13 – 29. <https://doi.org/10.31357/ijms.v8i2>



- World Health Organization Quality of Life Assessment Group (WHO-QOL group). (1988). Development and general psychometric prospects. *Social Science and Medicine*, 46, 1569- 86.
- Wu, H. S., Davis, J. E., & Chen, L. (2019). Impact of Comorbidity on Symptoms and Quality of Life Among Patients Being Treated for Breast Cancer. *Cancer Nursing*, 42(5), 381-387.  
<https://doi.org/10.1097/NCC.0000000000000623>
- Yan, X., Chen, X., & Li, M. (2019). Prevalence and risk factors of anxiety and depression in Chinese patients with lung cancer: a cross-sectional study. *Cancer Management and Research*, 11,4347– 4356.  
<https://www.dovepress.com/prevalence-and-risk-factors-of-anxiety-and-depression-in-chinese-patie-peer-reviewed-fulltext-article-CMAR>
- Yan, B., Yang, L-M., Hao, L-P., Yang, C., Quan, L., Wang, L-H., et al. (2016). Determinants of Quality of Life for Breast Cancer Patients in Shanghai, China. *PloS one*, 11(4), e0153714.  
<https://doi.org/10.1371/journal.pone.0153714>
- Yeo, W., Pang, E., Liem, G. S., Suen, J. J., Ng, R. Y., Yip, C. C., et al. (2020). Menopausal symptoms in relationship to breast cancer-specific quality of life after adjuvant cytotoxic treatment in young breast cancer survivors. *Health and Quality of Life Outcomes*, 18,  
<https://doi.org/10.1186/s12955-020-1283-x>
- Yuan, L., Pan, B., & Wang, W. (2020). Prevalence and predictors of anxiety and depressive symptoms among patients diagnosed with oral cancer in China: a cross-sectional study. *BMC Psychiatry*, 20: 394-409.  
<https://bmcp psychiatry.biomedcentral.com/articles/10.1186/s12888-020-02796-6>
- Yusoff, J., Ismail, A., Riza, M., Manaf, A., Ismail, F., Abdullah, N., et al. (2022). Quality of life of women with breast cancer in a tertiary referral university hospital. *Health and Quality of Life Outcomes*, 20(15),1-13.  
<https://doi.org/10.1186/s12955-022-01921-1>

**Table 1. Socio-demographics and clinical characteristics of BC patients (N= 97)**

Variables	Categories	N (%)
Age (years)	≤ 50	37 (38)
	> 50	60 (62)
Marital status	Married	76 (78)
	Unmarried/Single	21 (22)
Household income level	< Rs. 10000	60 (62)
	> Rs. 10000	37 (38)
Stage of cancer	Tumor	81 (84)
	Node+ Metastasis	16 (16)
Time since diagnosis	≤ 12 months	57 (59)
	> 12 months	40 (41)
Past Medical/Surgical history (comorbidities)	Medical	22 (23)
	Surgical	12 (12)
	Both	10 (10)
	None	53 (55)
Self-reported disabilities	Disables	38 (39)
	None disables	59 (61)
Body image changes (e.g., loss of breast/hair, skin changes, etc.)	Present changes	84 (87)
	No changes	13 (13)
Current or planned treatment	Chemotherapy	78 (80)
	Radiotherapy	12 (12)
	Other	7 (7)



**Table 2. The total scores and sub-scales/domains mean scores of QoL**

<b>Sub-scale/Domains</b>	<b>Mean (SD)</b>	<b>CI 95%</b>
Physical domain	60.97(11.56)	(58.64-63.30)
Psychological domain	63.52(11.63)	(61.17-65.86)
Social domain	47.86(13.89)	(45.05-50.66)
Environmental domain	69.05 (8.79)	(67.28-70.82)
Total score of QoL	248.09(34.07)	(241.23-254.96)



**Table 3. Effects of socio-demographics and clinical variables on QoL ( $\bar{x}$  (SD))**

Variables	n	Physical QoL - $\bar{x}$ (SD)	Psychological QoL- $\bar{x}$ (SD)	Social QoL- $\bar{x}$ (SD)	Environmental QoL- $\bar{x}$ (SD)	Total QoL- $\bar{x}$ (SD)
Age (years)						
≤ 50	37	64.08(10.12)	62.32(11.37)	51.51(16.86)	68.19(9.06)	246.11(36.42)
> 50	60	59.05(12.04)	64.25(11.82)	45.60(11.27)	69.58(8.66)	238.48(31.97)
<i>P</i> - value		<b>0.03</b>	0.43	0.06	0.45	0.28
Marital status						
Married	76	60.92(11.22)	64.61(10.80)	49.33(12.92)	69.53(7.25)	244.38(28.11)
Unmarried	21	61.14(12.98)	59.57(13.83)	42.52(16.19)	67.33(13.04)	230.57(48.40)
<i>P</i> - value		0.93	0.07	<b>0.04</b>	0.46	0.22
Household income						
≤ LKR. 10,000	60	60.92(12.13)	63.13(12.49)	45.85(13.57)	67.95(9.49)	237.85(35.56)
> LKR. 10,000	37	61.05(10.71)	64.14(10.23)	51.11(13.98)	70.84(7.30)	247.14(30.12)
<i>P</i> - value		0.95	0.66	0.07	0.11	0.18
Cancer stage						
Tumor	81	61.48(11.12)	63.46(11.70)	47.90(14.30)	69.32(9.07)	242.16(34.27)
Node+ Metastasis	16	58.38(13.66)	63.81(11.64)	47.63(12.02)	67.69(7.31)	237.50(31.62)
<i>P</i> - value		0.32	0.91	0.94	0.50	0.61
Time since diagnosis						
≤ 12 months	57	61.32(9.99)	64.91(11.52)	47.12(14.33)	69.00(8.19)	242.35(34.06)
> 12 months	40	60.48(13.60)	61.53(11.64)	48.90(13.35)	69.13(9.69)	240.33(33.65)
<i>P</i> - value		0.74	0.15	0.53	0.94	0.74
Past Medical/Surgical history (comorbidities)						
Medical	22	58.95(13.18)	61.23(8.91)	47.41(10.00)	69.91(9.12)	237.50(30.85)
Surgical	12	62.75(13.59)	65.75(9.02)	48.42(11.38)	71.00(4.67)	247.92(25.73)
Both	10	61.00(9.36)	55.10(10.55)	40.00(18.30)	68.80(8.80)	224.90(32.07)
None	53	61.40(10.93)	65.55(12.65)	49.40(14.70)	68.30(9.45)	244.64(36.32)
<i>P</i> - value		0.80	<b>0.04</b>	0.27	0.76	0.30
Self – reported disabilities						



Yes	38	58.39(12.94)	58.66(11.04)	46.16(16.18)	66.39(10.27)	229.61(37.60)
No	59	62.63(10.35)	66.64(10.99)	48.95(12.22)	70.76(7.29)	248.98(28.84)
<i>P</i> - value		0.07	<b>0.001</b>	0.36	<b>0.02</b>	0.005
Body image changes						
Yes	84	60.40(11.50)	62.68(12.07)	47.75(14.59)	68.79(9.11)	239.62(34.58)
No	13	64.62(11.68)	68.92(6.17)	48.54(8.41)	70.77(6.37)	252.85(25.80)
<i>P</i> - value		0.22	<b>0.007</b>	0.85	0.45	0.19
Current treatment						
Chemotherapy	78	58.82(12.10)	63.47(12.41)	48.55(13.93)	68.55(9.11)	240.40(35.27)
Radiotherapy	12	63.83(5.95)	62.08(9.43)	41.08(15.87)	68.83(7.96)	235.83(28.90)
Other	7	68.86(9.38)	66.43(3.20)	51.71(4.53)	75.00(3.46)	262.00(11.79)
<i>P</i> - value		0.09	0.73	0.16	0.17	0.22

NOTE:

$\bar{x}$  -Mean, SD- Standard deviation, QoL- Quality of life

For two groups independent t- test was applied and for more than 2 groups One-way ANOVA was performed.

Significant level was considered as  $p < 0.05$ .