

## Enhancing cancer care through addressing a neglected pillar: a narrative review on quality of life in Pakistani patients

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### Abstract

The current narrative review was planned to evaluate the quality of life of Pakistani cancer patients. Using relevant questionnaires and comparing global data over the last 2 decades, the review planned to explore artificial intelligence's role in cancer care, and to develop strategies for better outcomes. The review yielded poor results and exposed huge and neglected gaps in the overall approach towards the management of cancer patients based on different tumour types and categories. A few experimental interventions demonstrated promising results and echoed the need for further clinical and non-clinical experimentation for negating poor quality of life outcomes. Unsurprisingly, not a single study in the literature analysed, revealed a positive quality of life. A multi-pronged approach, therefore, must be brainstormed and safely implemented through experimentation of artificial intelligence and active coordination among healthcare bodies, finance/economic boards and welfare organisations that are active in countries like Pakistan to uplift the neglected quality of life domain among cancer patients, especially breast and oral cancers that have the highest incidences worldwide.

**Key Words:** Quality of life, Neoplasms, Breast neoplasms, Mouth neoplasms.

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### Introduction

In developing countries like Pakistan, the quality of life (QOL) domain is poorly investigated, particularly for cancer patients undergoing chemotherapies and complicated surgeries. Almost 40 years ago, a paper in the

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British Medical Journal stressed that QOL can “only truly be determined by the patient themselves”<sup>1</sup>.

The advent of personalized medicine, with advanced genomic testing, such as oncotype diagnosis (DX), and phenomenal tests measuring the effectiveness of planned chemotherapy (CT) through MammaPrint and BluePrint, are still a poor man's dream in developing countries, including Pakistan. They have brought into serious question the true benefits of strenuous CT.

Interestingly, a large review from the International Journal of Cancer, in addition to concluding a poor correlation between QOL and cancer treatment trials, found that almost 125,000 patients undergoing trials between 2010 and 2015 were not even assessed for QOL<sup>2</sup>. Developed countries are surely moving on from past documented complacencies<sup>3</sup>, but elsewhere the whole concept of a population-specific QOL is absent, and not only phase 3 clinical trials, but also patients undergoing chemoradiotherapy (CTRT) for years are not assessed for QOL changes before and after the treatment. The QOL of cancer patients at onset is generally poor due to low socioeconomic, nutritional status, and advanced disease presentation. Unfortunately, QOL is not even considered a prime factor before deciding different treatment/management plans for cancer patients. Today, even more important than investigating a greater number of patients is negating the complacency towards assessing QOL which is usually not included as an assessment tool during the treatment of patients. Not all patients are privileged to avail themselves of welfare and recreational respites at well-established tertiary care centres. A vast majority lives outside the realm of air-conditioned outpatient departments (OPDs) and daycare centres.

Breast and oral cancer incidences are among the highest<sup>4</sup> in Pakistan, not just in Asia, but globally. It must be interjected here how polychromatic QOL perception must be among the patients.

Are tamer options always presented conspicuously without bias to patients? Are the pros and cons thoroughly and patiently discussed in the OPDs? A skilled counsellor/planner should be assigned for individually

assessing and following patients regularly so they can be accorded freedom to choose devoid of guilt. Truly systematic approaches can only be implemented once patients can freely explore and brainstorm their emotional, psychosocial and financial indices with their family, primary oncologist, and a QOL assessor/counsellor whenever a patient so wishes. A fair percentage of patients and families will find much-needed respite, and guilt exoneration.

Cancer treatments are not split into acute failures or successes, but even a failed or refused treatment can become a happy journey as opposed to a successful one with a daunting QOL, i.e., progression-free survival (PFS) full of anxieties, depression, and low self-esteem.

It must be understood that experimental pictures of laboratory rat specimen X surviving a few weeks/months longer than specimen Y cannot be juxtaposed with humans whose QOL remains ambiguous and un-investigated. The choice is inevitably clear sometimes, like explaining hospice care in the face of God's miracles to an elderly person with anaplastic thyroid cancer<sup>5</sup>, or encouraging a young adult with anorectal carcinoma to undergo expensive CT with platinum analogues despite very rare side effects<sup>6</sup>. The scant overall literature<sup>7-19</sup> debriefed in the discussion section, from tertiary hospitals investigating patients in Punjab and Sindh reflects a bleak picture.

While according full closure to the remarkable progress of medical oncology so far through targeted and chimeric antigen receptor T (CAR-T) cell therapy and improved genetic testing, we must also question our medical fraternity regarding the true analysis of QOL in poor populations while propagating standard treatment protocols to patients, including the self-education of clinicians themselves regarding QOL, especially today when artificial intelligence (AI), in its primitive stages, could possibly be beneficial for filling gaps due to an extremely wide ratio between clinician/workforce and patients.

## Materials and Methods

The narrative review was conducted from January 2020 to February 2023, and comprised online search of PubMed, Google Scholar, Scopus and Cochrane databases using key words 'Quality of life', 'QOL', 'Cancer patients' and 'Pakistan'. All indexed and non-indexed studies from 2010 onwards were included. Cross-sectional surveys, retrospective and prospective cohort studies, and pilot studies were categorised and summarized based on the most common solid tumours in Pakistan, i.e., breast and head and neck (H&N) cancers, as well as haematological

malignancies. Moreover, studies which assessed interventions to address and experiment with QOL improvement were also included.

The studies were included if the sample comprised adults aged 18 years or older, diagnosed with cancer of any form, currently undergoing or having had cancer treatment within the preceding 5 years. The studies not meeting the inclusion criteria were excluded.

## Discussion

The earliest study locally investigating the prevalence of depression and anxiety among a general Pakistani cancer patient population of 60 different cancer patients was from the year 2010<sup>7</sup>. Unsurprisingly, a vast majority 70% (21/30) of the female population met the criteria for clinical anxiety and depression. In contrast, 33% (10/30) of the males accounted for the same maladies.

A cross-sectional study in Rawalpindi with 50 patients undergoing CT suggested that the QOL was linked to CT cycles<sup>8</sup>. Although the QOL scoring system did not demonstrate significant improvement in all the study areas, the obtained results indicated a significant correlation between QOL and the number of CT cycles in cancer patients.

Chagani et al. reported a dismal overall mean QOL score of  $57.37 \pm .13.11$  among 250 cancer patients undergoing CT for different tumours at the Aga Khan University Hospital (AKUH), Karachi<sup>9</sup>.

For ease of understanding, additional literature was categorised into specific cancer types.

### Breast Cancers

A cross-sectional survey assessed the QOL alongside physical, psychological and spiritual wellness among 250 female breast cancer (BC) survivors from the Institute of Nuclear Medicine and Oncology (INMOL) hospital and Mayo Hospital, Lahore. The majority of survivors (83%) reported fatigue during daily life activities, 75.1% experienced body aches or head pain, 77.1% revealed appetite problems, 63.2% reported weight-loss, 77.1% had sleep problems, and 90.5% reported feeling generalised weakness. Only 16.2% were content with their physical health and 2% were not content with their medication. In terms of psychological outcomes, 74.4% experienced different levels of anxiety and only 10% of patients reported hopes to achieve a desired life. The 21-40-year age group reported better physical health, whereas those aged 40-50 years and with a BC family history showed greater mental strength<sup>10</sup>.

An assessment of QOL conducted in 200 BC patients

using the EORTC QLQ C30/+ Br23 (European Organization for Research and Treatment of Cancer) questionnaire demonstrated a poor QOL index among the patients. An association between demographic parameters, i.e., age, marital status and education, and poor Global Health Scale (GHS) QOL was significant<sup>11</sup>.

An analytical cross-sectional study established lymphedema post-breast surgery/radiotherapy (RT) among 41.1% of 336 BC patients as an unpleasant and uncomfortable condition which was significantly associated with lower QOL due to arm symptoms severity. These symptoms were associated with decreased physical and psychosocial life quality<sup>12</sup>.

Almost one-third of 200 cancer patients were found to be depressed in a study, and mostly comprised those obtaining multimodality treatment or facing financial constraints, with religious/spiritual help being the main coping method sought predominantly by the females. Religion harbours an instrumental role in the lives of cancer patients, their QOL, and life determinations with respect to cancer progression<sup>13</sup>.

After categorizing into four main categories, i.e., feelings and perceptions of the patients, their challenges, coping methods, and teaching and informational needs, a study of 250 BC patients in Peshawar, Pakistan, concluded that women undergoing RT in their social culture suffered more intense psychological effects compared to the physical effects. Furthermore, cultural and religious norms turned into potential barriers for many female patients throughout the course of their illness presentation, diagnosis and treatment<sup>14</sup>.

### H&N tumours

A cross-sectional translational study of 361 H&N tumour patients identified 12 significant socio-demographic (age, gender, marital status, employment status, education level and ethnic background) and clinical-based factors (tumour site, tumour type, tumour size, tumour stage, treatment status and treatment type) of health-related QOL (HR-QOL)<sup>15</sup>.

A prospective, longitudinal study on oral and pharyngeal cancer survivors established a poor QOL outcome and perception among the 34 patients who completed the QOL survey<sup>16</sup>.

A large prospective cohort study was conducted among 250 brain cancer patients in Pakistan at AKUH to assess the QOL and resilience using validated scales. It concluded that QOL in the patients was a function of clinical indices, such as pre-existing comorbidities, usage of a urinary catheter, social factors, namely family income

and social support, and psychological factors, namely mental illness and resilience<sup>17</sup>.

### Haematological malignancies

In a large blood cancer patient pool of 400 participants from the twin cities of Islamabad and Rawalpindi in Pakistan, poor HR-QOL was reported, with emotional functioning and cognitive function being the most compromised domains overall<sup>18</sup>.

### Paediatric tumours

A HR-QOL survey comprising a paediatric population from Lahore, Pakistan, demonstrated a decreased QOL perception among patients compared to healthy children, which depicted the need for psychological health services to serve the physically challenged population. A yet primitive experimentation, i.e., psychological support, CT outreach, has seen very little progress or implementation for addressing and improving QOL among diseased children as opposed to healthy controls<sup>19</sup> (Table).

### Interventions for improving QOL

**Surgical interventions:** A prospective study on a sample of 84 patients in Lahore evaluated satisfaction/aesthetic outcomes between the patients undergoing mastectomy alone versus those undergoing mastectomy followed by immediate reconstruction. The results showed that the latter group experienced improvement in appearance, psychosocial and sexual wellbeing<sup>20</sup>.

Breast conservation surgery was associated with significant improvements in QOL scores in terms of social and psychological wellness, with comparable physical and spiritual wellness, in a study pool of 216 patients<sup>21</sup>.

**Non-surgical interventions:** A cross-sectional survey of 250 cancer patients from the cities of Lahore, Faisalabad and Sargodha illustrated that religiosity, QOL, and a sense of coherence were positively correlated with each other. Religiosity had a significantly positive and direct effect on QOL ( $p < 0.001$ ) and the significant indirect effect of religiosity through the need for a sense of coherence was also significant ( $p < 0.001$ ). It was concluded that religiosity increases the sense of coherence which consequently enhances the QOL of cancer patients. These results demonstrate significant practical and theoretical implications, particularly for patients with a Pakistani background<sup>22</sup>.

A study retrospectively audited documented care for 45 palliative care patients before and post-implementation of the end-of-life care (ELC) pathway. Results revealed that 67% patients were not prescribed PRN (pro re nata/as needed) medications for symptomatic management, 20%

**Table:** Studies analysed.

Authors	Year study conducted	Cancer type	Mode of Treatment	Number of Patients	Location	Parameters Assessed	Outcome/ Impact on Living
Dogar IA et al <sup>7</sup>	2010	Multiple	Chemotherapy	60	Karachi	Anxiety and Depression	Poor
Mohsin S et al <sup>8</sup>	2016	Multiple [Breast, Lung, Genitourinary & Oral cavity Cancers]	Chemotherapy	50	Rawalpindi	QOL correlation with number Chemotherapy [CT] cycles	Unfavourable
Chagani et al <sup>9</sup>	2017	Multiple [ Breast, Lung, Head & Neck, Colon, others]	Chemotherapy	250	Karachi	QOL	Unfavourable
Azam M et al <sup>10</sup>	2021	Breast	Multimodal	250	Lahore	Somatic symptoms, sleep quality and general well being	Poor
Saleha SB et al <sup>11</sup>	2009	Breast	Multimodal	200	Lahore	QOL	Poor
Waheed HY et al <sup>12</sup>	2012	Breast	Surgical + Radiotherapy	336	Karachi	QOL	Unfavourable
Rashid YA <sup>13</sup> et al	2012	Breast	Chemotherapy	200	Karachi	Depression	Unfavourable
Habibullah G <sup>14</sup> et al	2016	Breast	Radiotherapy	250	Peshawar	Psychosocial	Poor
Naqvi SU <sup>16</sup> et al	2017	Head & Neck	Surgical + Radiotherapy	34	Karachi	QOL	Poor
Zahid N et al <sup>17</sup>	2019	Head & Neck	Multimodal	250	Karachi	resilience and its relationship with socio-demographic factors and mental health	Unfavourable
Malik M et al <sup>18</sup>	2021	Haematological	Chemotherapy + Radiotherapy	400	Islamabad & Rawalpindi	QOL and Mental health	Poor
Chaudhry Z and Siddiqui S <sup>19</sup>	2012	Paediatric tumours [ Brain, haematological & Others]	Chemotherapy	26	Lahore	QOL	Unfavourable

Outcomes were categorised as Favourable, Unfavourable or Poor based on the reported and subjective conclusions from the study findings.

were not reviewed for assisted nutritional requirements, and 20% patients' primary team was not informed that their patient was dying<sup>23</sup>.

Relevant findings from a study on 80 patients concluded that social support can lower death anxiety and improve recovery in BC patients, the majority of whom continued to be affected by death anxiety, specifically based on their marital and educational statuses<sup>24</sup>.

Following 14 in-depth telephonic interviews conducted on oral cancer (OC) patients at the Shifa International Hospital, Islamabad, it was recommended that a socio-

behavioural change campaign can minimise financial burdens and enhance the QOL of OC patients. The campaign proved effective in minimising the financial strain on patients and the health system through earlier clinic consultations/presentation and negating reported delays before seeking medical advice<sup>25</sup>.

In a pilot study conducted on 25 controls and 25 intervention-receiving patients in Karachi, intervention through educational and emotional support was proven efficacious in improving QOL of BC patients undergoing CT, but a larger study would be required to confirm the findings<sup>26</sup>.

A significant reduction was demonstrated in the overall mean anxiety and depression scores of the experimental group ( $p=0.001$ ) from pre-test to post-test through individualised educational interventions in a pilot investigation among 65 RT-receiving BC patients, whereas the overall mean anxiety and depression scores of the control group showed no significant difference<sup>27</sup>.

### **Brief comparison/contrast with similar Asian & Middle Eastern populations**

Quality of Life (QOL) was assessed by the EORTC QOL in 20 studies, with 6034 patients from the Middle East. The reported mean QOL ranged between 31.1 and 75.6. Based on the random effect method results, the overall mean of the QOL was 60.5 (95% confidence interval (CI) 56.0, 65.0; (I<sup>2</sup> = 99.0%). Among six studies conducted on 1053 individuals, QOL was categorized as good, moderate, or poor. Fewer than one-third of patients (21%) demonstrated a good QOL<sup>28</sup>.

Of 232 initial studies, 18 final studies conducted on 2263 people were included for the final stages of the study. Based on the EORTC-QLQ-C30 and random effect method, the pooled mean score of QOL in 1073 people was 57.88 (95% CI 48.26–67.41) and the pooled mean score of QOL based on WHOQOL-BREF in 357 people was 66.79 (95% CI 45.96–87.62). As per results, a moderate QOL level was seen in these Iranian women with breast cancer (BC)<sup>29</sup>.

A cross-sectional survey conducted among 233 Malaysian patients concluded that age and employment were significant predictors for Global Health Status (GHS). The QOL among BC patients, reflected by the GHS, improved as age and employment increased. "Hair loss upset" demonstrated the highest symptom score<sup>30</sup>.

A cross-sectional study among 359 BC patients from Bangladesh revealed that women aged over 40 had higher odds of demonstrating poor QOL versus women aged under 40 years. It emphasized the need for integrating psychosocial segments for both patients and informal healthcare providers in the cancer treatment services domain<sup>31</sup>.

### **Studies using AI for obtaining QOL responses**

A study in Taiwan involving 402 BC patients aimed at validating the use of artificial neural network (ANN) models<sup>32</sup> for predicting QOL following BC surgery up to 2 years postoperatively, and compared the predictive capability of ANNs with linear regression (LR) models. The accuracy of the system models was assessed in terms of mean square error (MSE) and mean absolute percentage error (MAPE). Compared to the LR model, the ANN model

generally had lower MSE and MAPE values in both the training and testing datasets. In contrast to the conventional LR model, the ANN model demonstrated greater accuracy in predicting patient-reported QOL and had better overall performance indicators<sup>32</sup>.

The ONCORELIEF system<sup>33</sup>, a novel digital aiding tool from a European prospective study sample pool of 60 colorectal cancer and 30 acute myeloid cancer patients demonstrated promising potential by thoroughly identifying, collecting, and processing data from diverse patient domains to offer healthcare recommendations, support cancer patients in addressing their unmet needs, optimise survivorship care, and improve QOL<sup>33</sup>.

The current review highlights the significant challenges faced by Pakistan, the world's 5th most populous Muslim-majority nation, as it grapples with a faltering economy. The lack of improvement and worsening QOL, compared to similar populations/countries can be partly attributed to a poorer economy and rising inflation in Pakistan. The phase after the coronavirus disease-2019 (COVID-19) has seen a surge in inflation across the globe, particularly in Southeast Asia<sup>34</sup>, which reports one of the highest incidences of breast and H&N cancers<sup>35</sup>.

A silver lining for similar economies and populations is the recent global advent of AI, which, despite being in its early stages, might aid in addressing and balancing the ratio between clinician workforce and cancer patients when addressing and highlighting poor QOL outcomes, as is routinely practiced in the developed populations.

The current narrative review has its limitations. Excluding 2 studies using AI conducted internationally<sup>32,33</sup>, the review only analysed studies carried out within Pakistan. The findings have been mostly compared with studies done mostly in Muslim-majority populations/countries, as they share similar cultural norms and practices, especially among women diagnosed with BC. For clarity and to maintain brevity and relevance in comparisons, literature from non-Muslim Asian populations/countries was not included.

### **Conclusion**

Studies researching QOL among Pakistani cancer patients yielded poor results, and exposed significant gaps in the overall approach towards the management of cancer patients. A few interventions showed promising results and underscored the need for further clinical and non-clinical experimentation and interventions to counter poor QOL outcomes in disease-free, progression-free, and even end-stage cancer patients. A multi-pronged approach must be brainstormed and safely implemented



through the use of AI and active coordination among relevant stakeholders to uplift the QOL domain among cancer patients.

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**Authors' Contribution:**

**TKJ, SA:** Design, concept and drafting.

**SUK:** Literature search and data collection.

**FZ:** Critical review and final drafting of the discussion.

**HKA:** Final critical revision and reviewing.