



# Considerations for health-related quality of life in breast cancer survivorship

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Breast cancer is the most common type of cancer in women and is the leading cause of cancer-related death among females worldwide (1). Advances in oncologic diagnostics and treatment of cancer have progressed to the point in which cancer is considered a chronic disease (2). Of all chronic diseases, cancer and oncologic treatment may produce the most significant concern to those inflicted (2). Breast cancer and oncologic treatment can have significant negative effects on physical function (3) and health-related quality of life (HRQOL) (4).

Poor physical and mental HRQOL has been reported among cancers survivors, 24.5% and 10.1%, respectively (5). Comparing these incidences with adult non-cancer populations, 10.2% and 5.9% reveals significant ( $P < 0.0001$ ) differences (5). Additionally, incidence rates of common mental health conditions are relatively higher in individuals with cancer and there is a treatment gap (6). In another study, frailty and pre-frailty may be more common in breast cancer survivors compared to women with no history of cancer (7). Physical function (3) and HRQOL (4) are both predictors of breast cancer survival. Decreased physical function is associated with decreased health-related physical fitness and increased breast cancer-related morbidity and mortality (8,9). Cancer survivors with higher levels of objective and patient reported physical function are less likely to die prematurely than cancer survivors with lower levels of physical function (8,9). In a prospective cohort study functional limitations subsequent to breast cancer and oncologic treatment were associated

with reduction in all-cause and competing cause survival, irrespective of clinical, lifestyle and sociodemographic factors (3).

In an article entitled “Health-Related Quality of Life in a Predictive Model for Mortality in Older Breast Cancer Survivors”, published in the *Journal of American Geriatric Society*, by DuMontier *et al.*, developed a predictive model and risk score for 10-year mortality using HRQOL domains of physical function, mental health and social support in older women with early stage breast cancer (10). In this prospective cohort design 660 women aged 65 and older with stage I ( $\geq 1$  cm), II or IIIA breast cancer were studied (10). The main outcome measure was 10-year all-cause mortality. Baseline participant characteristics were: (I) 74% of the women were 70 years old or older; (II) 93.4% white; (III) 82.4% at least high school diploma; (IV) 86.2% had 1 comorbidity, 34.7% had 3 or more; (V) about half had Stage 1 breast cancer; (VI) 80.5% received definitive primary therapy; 75.5% received endocrine therapy; (VII) 65.8% reported good health-related physical function (PFI-10  $\geq 80$ ); (VIII) 68.9% half reported good mental health (MHI-5  $\geq 80$ ); and (IX) 50.5% reported good social support (mMOS-SSS  $\geq 80$ ). The final viable sample of participants was 641 women (97.2%).

Results from predictive modeling (from fully adjusted) showed improved physical function and mental health were each independently associated with lower mortality (PFI-10  $\geq 80$ : OR =0.64, 95% CI =0.44–0.94; MHI-5  $\geq 80$ : OR =0.56, 95% CI =0.37–0.83). Social support was modestly

associated with mortality ( $M_{\text{mortality}} \geq 80$ : OR =0.76, 95% CI =0.52–1.11). Modeling using age, breast cancer stage and comorbidity resulted in a Nagelkerke  $R^2$  (NR) model performance statistic of 0.151 and an area under the curve (AUC) discrimination statistic of 0.696. Adding definitive primary therapy, chemotherapy and endocrine therapy to the adjust model (above) resulted in a NR statistic of 0.190 and an AUC statistic of 0.715. Additionally including the HRQOL variables (physical function, mental health and social support) to the above adjusted model (6 variables) the fully adjusted model (9 variables) resulted in the highest overall model performance (NR =0.221) and calibration to the AUC of 0.742.

In summary, DuMontier *et al.* “despite their growing support in the literature, HRQOL measures are not widely employed in practice settings due to time and resource constraints, lack of knowledge regarding how to assess HRQOL in patients and lack of understanding how to use the gathered information”. Furthermore, the authors suggest that interventions targeted towards improving physical function, mental health and social support may improve HRQOL and survival.

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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