Psychometric properties and correlates of a brief scale measuring the psychological construct mattering to others in a sample of women recovering from breast cancer

Samantha M. Davis[1] · Stephen J. Lepore[2] · Levent Dumenci[3]

Abstract

Purpose Mattering to others, or perceiving one is a significant part of the social world, may be important to breast cancer survivors' quality of life. This study examines the reliability and validity of the 5-item general mattering scale (GMS) to assess mattering in breast cancer survivors.

Methods A secondary analysis and confirmatory factor analysis (CFA) were performed on data from an intervention study with breast cancer survivors that included the GMS and other psychological measures.

Results The unidimensional representation of the GMS was consistent with the data ($\chi^2 = 8.102$; df = 4; $p = .088$). The scale was highly reliable as indicated by McDonald's omega of .84. The scale was significantly correlated with all psychological measures in the predicted direction except anxiety. After controlling for social support, the scale was significantly, positively correlated with functional quality of life, self-esteem, positive affect, and having meaning in life. Mattering was significantly, negatively correlated with searching for meaning. Significantly higher level of mattering was found among married participants and among women who had not obtained psychological therapy.

Conclusions The 5-item GMS is a practical, reliable, and valid tool the measuring mattering to others among breast cancer survivors.

Keywords Breast cancer · Quality of life · Mattering · Meaning in life

✉ Samantha M. Davis
tug76730@temple.edu

Stephen J. Lepore
slepore@temple.edu

Levent Dumenci
tug27846@temple.edu

[1] Department of Social & Behavioral Sciences, College of Public Health, Temple University, 1301 Cecil B. Moore Avenue, 974 Ritter Annex, Philadelphia, PA 19122, USA

[2] Department of Social & Behavioral Sciences, College of Public Health, Temple University, 1301 Cecil B. Moore Avenue, 957 Ritter Annex, Philadelphia, PA 19122, USA

[3] Department of Epidemiology and Biostatistics, College of Public Health, Temple University, 1301 Cecil B. Moore Avenue, 939 Ritter Annex, Philadelphia, PA 19122, USA

Introduction

Breast cancer is one of the most common cancers among women [1]. Breast cancer is associated with increased depressive symptoms, fear of reoccurrence, distress, fatigue, and feelings of isolation, as well as decreased self-esteem and quality of life [2–9]. A breast cancer diagnosis can bring on an existential crisis, leading people to question life's meaning, purpose and value [10, 11]. Identifying modifiable factors that can potentially fill patients' life with meaning and value, and uplift their mood can inform theory related to psychosocial adjustment to cancer and provide targets for intervention [12–15]. Social factors, such as social support, are modifiable and have been extensively studied and linked to psychological adjustment to cancer [16–19]. This study describes a novel social factor, mattering to others, that may be both modifiable and linked to meaning in life and psychosocial adjustment in cancer survivors.

Mattering to others was first defined as a social psychological construct in 1979 [20]. Mattering has been defined as

viewing ourselves as a significant part of the world, in that we perceive others care about us, would seek advice from us, and would be distraught if we were no longer in the world [20, 21]. If individuals feel that they do not matter to others—that no one acknowledges them or relies on them—they must cope with the feeling of irrelevance [21, 22]. Mattering was first investigated in a study of adolescents, which showed that a higher feeling of mattering to one's parents was associated with lower levels of depression, anxiety, and delinquent behaviors [20]. Other studies have shown that mattering to others is positively related to self-esteem, psychological well-being, and having meaning in life, and inversely related to depression and distress [20, 23–26].

Mattering to others may be important to women recovering from breast cancer in various ways. For example, a mother with dependent children who is diagnosed with breast cancer may feel threatened by the cancer but also motivated to get better in order to meet the needs of her children. Similarly, mattering to other family members, friends, and co-workers may motivate breast cancer survivors to engage in rewarding and life affirming social and work activities. Among women with gynecological cancer, mattering to others has been identified as potentially important to psychological adjustment [27], but there is limited research measuring mattering and linking it to psychological outcomes in cancer survivors. The Handbook of Cancer Survivorship discusses strategies for increasing survivors sense of mattering and increasing a sense of life purpose [28], but, again, research is lacking. To develop this research area, it is first necessary to identify an appropriate, validated and reliable measure of mattering to others for cancer survivors.

The present study focuses on a frequently used brief measure of mattering to others, the 5-item general mattering scale (GMS) [20, 29]. The brevity of the measure makes it appealing as a research tool, particularly with clinical populations where response burden is a consideration. While the GMS has not been used with cancer patients, it has been used in a variety of populations, including employees, students, young adults, military personnel, homeless men, and the general population [22, 23, 26, 30–33]. In a community sample, women reported higher levels of mattering compared to men in a study of depression [23]. Social roles may influence perceived mattering. For example, within a general population, women, parents, those involved in a romantic relationship, those currently employed, and those with higher levels of education had the highest levels of mattering to others [22].

As stated above, the reliability and validity of the GMS within a cancer population has not yet been published but is an important research objective. Moreover, the construct mattering to others has not been studied extensively within the cancer population, which is a gap in the literature. Cancer may cause a re-evaluation of roles, posttraumatic growth,

or adoption of a new perceived identity [34–36]. Previous research has identified the need to explore how sense of mattering may change with role changes, and if mattering to others at times of role changes has any association (positive or negative) with outcomes, such as well-being [22]. For example, any change in role status due to a major life event, such as a life-threatening illness, could diminish a person's sense of mattering. This shift in mattering, in turn, could negatively affect psychological well-being and role functioning. Further, a lack of belonging and perceived mattering is related to the loss of the desire to live and suicidal behavior [24, 37]. If individuals feel that they do not matter to others, they may be more depressed and lose interest in life. These detrimental effects of low levels of mattering, coupled with a life-changing event, such as a cancer diagnosis, suggest that the construct of mattering within cancer patients is a significant area of research.

Supportive social connections may act as a buffer for stress and increase well-being in cancer patients [38, 39]. Longitudinal studies and systemic reviews of long-term breast cancer survivors have found that amount of social support positively predicts quality of life [40–42]. Mattering to others and social support are expected to be positively correlated, but also unique constructs that are independently related to quality of life outcomes in cancer survivors. Additionally, among cancer survivors, as observed in other populations, it is expected that mattering to others would be positively related to self-esteem, having a sense of meaning in life, psychological well-being (positive affect), and quality of life [20, 23–26]. The relations between mattering and these psychological factors could exist even when the related factor of social support is accounted for. For instance, in a community sample, the inverse relation between mattering and depression remained significant after controlling for social support [23]. Further, a person's status such as marital relationship has been associated with perceived mattering [22] and should be investigated within the cancer population.

The study hypothesized that mattering to others would be inversely related to depressive symptoms, anxiety and searching for meaning in life, and would be positively related to social support, self-esteem, having meaning in life, positive affect, and quality of life. The study also hypothesized the association between mattering and psychological outcomes, when controlling for social support, would demonstrate independence of these constructs, social support and mattering. Further, the study hypothesized that perceived mattering to others would vary by known groups based on prior research [22]: sense of mattering would be highest among those who are employed, married, and have not engaged in psychological therapy post cancer treatment. The study aims are to investigate these hypotheses and to report the reliability and validity of the GMS within a population of breast cancer survivors.

Methods

A secondary analysis was performed on data collected in a randomized controlled trial (ClinicalTrials.gov NCT01396174) designed to test the efficacy of two distinct online support groups on depression and anxiety in breast cancer survivors [43]. The study received approval from Temple University's Institutional Review Board and informed consent was obtained from all participants. Self-report data were collected via structured telephone interviews administered one-month before (baseline) and one-month after (follow-up) intervention (mean time between assessments = 76 days; SD = 14 days). Analyses used data from the pre-intervention baseline interviews to avoid contamination of measures and associations due to intervention.

Participants and setting

The original study used a state cancer tumor registry to identify and recruit potentially eligible women who had been diagnosed with early stage breast cancer [43]. Inclusion criteria included: stage I or II breast cancer in past 36 months; age 21 to 65 years; Internet access; fluency in English; and distressed (scoring above normal [≥ 8] for levels of depression or anxiety on the Hospital Anxiety and Depression Scale [HADS]) [44]. Exclusion criteria included: current or prior cancer, other than breast or non-melanoma skin cancer. Of the 184 enrolled participants, one was withdrawn due to inadvertently accessing the wrong support group, leaving 183 participants with baseline data.

Measures

The general mattering scale (GMS) consists of five questions: (1) "How important are you to others?"; (2) "How much do others pay attention to you?"; (3) "How much would you be missed if you went away?"; (4) "How interested are others in what you have to say?"; and (5) "How much do other people depend upon you?" Response categories are: (0) "not at all," (1) "a little bit," (2) "somewhat," (3) "quite a bit," and (4) "very much." An average score is calculated to generate a total GMS score, with higher scores signifying higher perceived mattering to others. The GMS has been found to be moderately reliable within a large community sample, a sample of homeless men and a sample of adolescents ($\alpha = 0.63$–0.85) [20, 23, 31]. A study using the GMS and a similar measure, the Mattering to Others Questionnaire, found the two scales

were significantly and positively correlated ($r = .29$, $p = .001$), and both measures were significantly and positively correlated with a wellness measure in adolescents [26]. In the current study, reliable and valid measures were used to evaluate the validity of the GMS in the sample of breast cancer survivors.

Social support was measured using three sub-scales from the Social Provisions Scale: attachment, guidance, and social integration [45]. The three sub-scales, comprising a total of 12 items, were largely correlated (r's range from .74 to .82) and thus were averaged into a single composite scale, with a higher score indicating more social support ($\alpha = .80$). The measure is validated and reliable [45] and has been used with breast cancer patients in previous research [46].

Positive affect was measured using the 10-item Positive Affect subscale from the Positive and Negative Affect Scale (PANAS) ($\alpha = 0.91$), with a higher score indicating more positive affect [47]. The measure is validated and reliable [47, 48] and has been used with breast cancer patients in previous research [49].

Self-esteem was measured using the 10-item Rosenberg's Self-Esteem Scale ($\alpha = .89$), with a higher score indicating more self-esteem [50]. The measure is validated and reliable [50] and has been used with breast cancer patients in previous research [51].

Quality of life was measured using two scales from the Functional Assessment of Cancer Therapy–Breast (FACT-B): the 7-item Physical Well-being scale ($\alpha = .82$) and the 7-item Functional Well-being scale ($\alpha = .78$) [52]. Higher scores indicate higher quality of life in each scale. The two sub-scales were examined independently, as they capture unique aspects of quality of life. The measure is validated and reliable [52] and has been used with breast cancer patients in previous research [53].

Purpose in life was measured using the two sub-scales of the Meaning in Life questionnaire: the 5-item Searching for Meaning scale ($\alpha = .90$), with a higher score indicating more ongoing searching for meaning in life and the 5-item Presence of Meaning scale ($\alpha = .89$), with a higher score indicating more perceived presence of meaning in life [54]. The measure is validated and reliable [54] and has been used with breast cancer patients in previous research [55].

Distress was measured using the two sub-scales of the Hospital Anxiety Depression Scale (HADS): the 7-item Anxiety scale ($\alpha = .67$) and the 7-item Depression scale ($\alpha = .77$), with higher scores indicating more anxiety or depression symptoms, respectively [44]. The measure is validated and reliable [44] and has been used with breast cancer patients in previous research [56].

Demographic and behavioral variables—marital status, employment status, and receiving psychological therapy—were used to assess validity based on known groups. Women who were more socially integrated by virtue of being

married or employed were expected to have higher mattering scores than their less socially-integrated counterparts. It was also expected that women who had obtained psychological therapy since their cancer diagnosis would rate themselves lower in mattering than women who did not obtain therapy.

Statistical analyses

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 25.0 [57]. Structural Equation Modeling analyses were conducted using Mplus Version 6.0 [58]. Data analysis began by looking descriptively at each item within the GMS. Two

confirmatory factor analytic models were tested: One-factor model (Model 1; see Fig. 1) and one-factor model with a method effect (Model 2; see Fig. 2). The testing of a method effect was warranted due to rephrasing of a specific domain in items 2 and 4. The method factor was specified as orthogonal to the mattering factor with unit factor loadings [59]. In addition to Chi square test, we used root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and comparative fit index (CFI) to evaluate model fit [60]. The RMSEA ranges from 0 to 1, with a value of .06 or less indicating acceptable model fit. The CFI > .90 indicates acceptable model fit. The SRMR of .08 or less indicates acceptable fit.

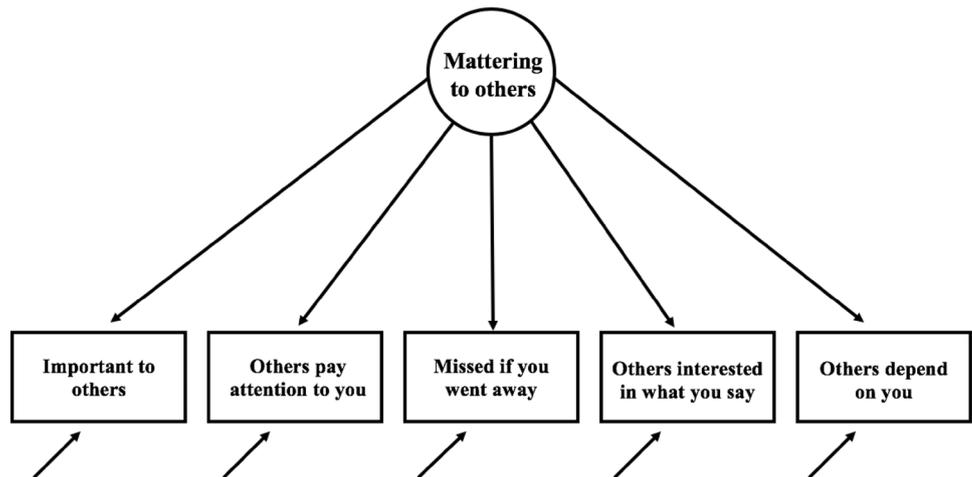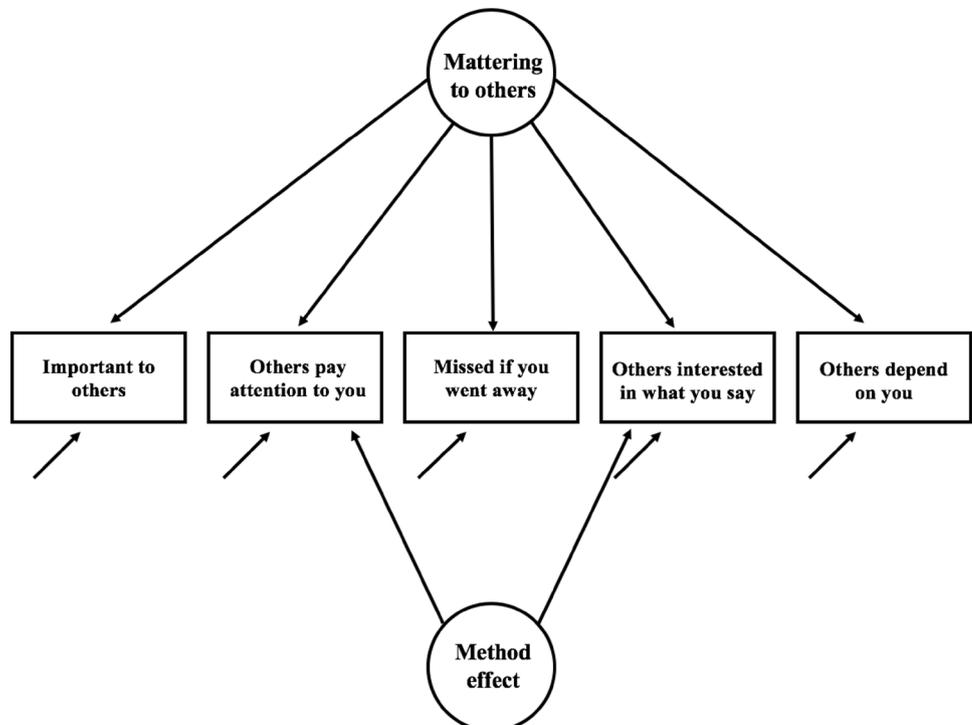**Fig. 1** Unidimensional depiction of mattering to others construct

Fig. 2 Unidimensional depiction of mattering to others construct with method effect

Items were examined for missing and non-response, as well as their skewness and kurtosis. A 5-point ordinal response format was considered as continuous in model fitting. All items were negatively skewed. For these reasons, we used MLF estimator in Mplus to explicitly take into account non-normal item distributions. One respondent missed item 5 at baseline and it was replaced with the scale mean; no additional data imputation or transformation was performed.

Scale reliability was estimated using McDonald's coefficient omega and corrected item-total correlations [61]. McDonald's omega was selected over Cronbach's alpha, as it has been shown to be a more reliable estimate and overcomes some of the inherent limitations of Cronbach's alpha, such as having fewer assumptions and problems associated with inflation and attenuation [62]. A high omega (> .70) and acceptable inter-item correlations (> .30) are needed to establish reliability based on internal consistency [63]. Correlation strength was defined using Cohen's widely accepted standards for labeling effect sizes: $r \sim .1$ = small, $r \sim .3$ = medium, and $r \sim .5+$ = large effect size [64].

Validity was investigated. The patterns of correlations between the GMS and other measures in the study were used to examine this, as well as examining the differences in GMS scores between possible known groups. The zero-order correlations examined were the GMS with social support, positive affect, quality of life (physical and functional), self-esteem, meaning in life (presence and searching), and psychological distress (anxiety and depression symptoms). Next, partial correlations for these factors with the GMS were examined controlling for social support, because we expected these two constructs to be highly related. Additionally, independent sample t-tests were used to test differences in mean levels of mattering across levels of marital status, employment status, and receipt of therapy.

Results

As shown in Table 1, on average, women were 52.26 (SD = 7.70) years old, white, married, and highly educated. The average total GMS score was 2.92 (SD = .66; Range = .60 – 4.00), indicating that the sample tended to perceive that they mattered to others "quite a bit." The Model 1 did not fit well (χ^2 = 40.29, df = 4, $p < .001$, RMSEA = .20, CFI = .91, SRMR = .06) but Model 2 did (χ^2 = 8.01, df = 4, p = .09, RMSEA = .07, CFI = .99, SRMR = .03). Consequently, the one-factor model with the method factor was accepted as the measurement structure of the GMS. As shown in Table 2, all standardized factor loadings were large (range: .59–.81). Internal consistency was high, based on McDonald's omega (ω = .84). All inter-item correlations showed medium effect size ($r \geq .28$; see Table 3).

Table 1 Sample characteristics ($N = 183$)

	N	%
Ethnicity		
White	174	95.1
Black or African American	3	1.6
Asian or Pacific Islander	2	1.1
More than one race	2	1.1
Other	1	0.5
Missing	1	0.5
Age group, years		
≤ 40	13	7.1
41–59	135	73.8
≥ 60	35	19.1
Marital status		
Married/living with someone	156	85.2
Not married/not living with someone	27	14.8
Education		
High school graduate or GED	31	16.9
Vocational school or some college	62	33.9
College degree	51	27.9
Above college degree (i.e., graduate degree)	39	21.3
Employment		
Employed (full-time or part-time)	126	68.9
Not employed	57	31.1

Validity

The study examined validity of the GMS in several ways. First, criterion validity was assessed based on the theoretical centrality of mattering to others to self-concept and psychological functioning. The study examined whether higher mattering to others was associated with better self-concept and psychological outcomes. As expected, zero-order correlations showed that mattering to others (GMS) was: (a) significantly and positively correlated with self-esteem (Rosenberg's Self-esteem Scale), having meaning in life, functional and physical quality of life (FACT-B), and positive affect (PANAS); and (b) significantly and negatively correlated with depressive symptoms (HADS-D) and searching for meaning in life (see Table 4). Mattering was inversely correlated with level of anxiety (HADS-A), but not significantly so.

Second, the study examined whether mattering to others (GMS) showed convergent validity with a similar social construct, perceived social support (Social Provisions Scale). As expected, the two measures were significantly, positively correlated ($r = .67$, $p < .001$) (see Table 4). The study next examined whether mattering to others accounted for unique variance in the psychological outcomes independent of social support. Partial correlations were calculated, with mattering to others as a predictor and social support as

Table 2 General mattering scale factor structure (N = 183)

Item	Standardized factor loadings	Corrected item-total correlation
Item 1. How important are you to others?	.79	.81
Item 2. How much do others pay attention to you?	.76	.67
Item 3. How much would you be missed if you went away?	.80	.82
Item 4. How interested are others in what you have to say?	.71	.63
Item 5. How much do other people depend upon you?	.53	.59

Robust maximum likelihood estimator was used to take into account non-normal item distributions in factor analysis

Table 3 General Mattering Scale inter-item correlation, covariance, and variance matrix (N = 183)

	Item 1	Item 2	Item 3	Item 4	Item 5
Item 1. How important are you to others?	.55	.56	.65	.54	.49
Item 2. How much do others pay attention to you?	.33	.66	.57	.69	.32
Item 3. How much would you be missed if you went away?	.43	.42	.83	.51	.52
Item 4. How interested are others in what you have to say?	.33	.46	.38	.68	.28
Item 5. How much do other people depend upon you?	.34	.24	.44	.22	.87
Mean	3.17	2.65	3.19	2.61	2.98
SD	.74	.81	.91	.82	.94

Variances on the diagonal, correlations above the diagonal and covariance below

Table 4 General Mattering Scale correlations with other psychological measures (N = 183)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. GMS, mattering[a]	1									
2. HADS, depression[b]	−.36**	1								
3. HADS, anxiety[b]	−.12	.28**	1							
4. Social provisions scale	.61**	−.49**	−.20**	1						
5. Meaning in life, presence	.56**	−.45**	−.26**	.54**	1					
6. Meaning in life, searching	−.28**	.14	.17*	−.25**	−.40**	1				
7. Rosenberg's Self-esteem	.56**	−.43**	−.29**	.50**	.72**	−.31**	1			
8. PANAS, positive affect[c]	.54**	−.62**	−.21**	.46**	.60**	−0.12	.61**	1		
9. FACT-B, functional[d]	.45**	−.66**	−.31**	.47**	.59**	−.21**	.58**	.71**	1	
10. FACT-B, physical[d]	.25**	−.52**	−.27**	.35**	.26**	−0.04	.31**	.51**	.60**	1

[a]*GMS* General mattering scale score

[b]*HADS* Hospital anxiety depression scale

[c]*PANAS* Positive and negative affect scale

[d]*FACT-B* Functional assessment of cancer therapy—breast

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

a control variable (see Table 5). After controlling for social support (Social Provisions Scale), mattering was still significantly and positively correlated with functional quality of life (FACT-B, functional), self-esteem (Rosenberg's Self-esteem Scale), positive affect (PANAS), and having meaning in life (see Table 5). Also, after controlling for social support, mattering was significantly and negatively correlated with searching for meaning. However, after controlling for social support, mattering to others was not correlated with

symptoms of depression (HADS-D) or physical quality of life (FACT-B, physical), and continued to be unrelated to anxiety symptoms (HADS-A).

Third, the study examined the extent to which the measure distinguished between groups that would be expected to vary in level of perceived mattering to provide evidence for validity. Validity was supported by finding significantly higher levels of perceived mattering to others: (a) among married participants (M = 14.94, SD = 3.10) than among

Table 5 General mattering scale partial correlations, controlling for social support (N = 183)

	Correlation	Significance
PANAS, positive affect[a]	.37	<.001
Rosenberg's Self-esteem	.37	<.001
Meaning in life, presence	.34	<.001
Meaning in life, searching	−.17	.023
FACT-B, functional[b]	.23	.002
FACT-B, physical[b]	.048	.516
HADS, anxiety[c]	.003	.964
HADS, depression[c]	−.093	.210

[a]*PANAS* Positive and negative affect scale

[b]*FACT-B* Functional assessment of cancer therapy—breast

[c]*HADS* Hospital anxiety depression scale

their unmarried counterparts ($M = 12.52$, $SD = 3.70$) $t(181) = -3.65$, $p < .001$ and (b) among women who had not obtained psychological therapy ($M = 15.04$, $SD = 3.16$) than among their counterparts who had ($M = 13.58$, $SD = 3.39$); $t(181) = 2.83$, $p = .005$. Women had higher levels of mattering if they were employed ($M = 14.87$, $SD = .29$) than if they were not employed ($M = 13.95$, $SD = 0.43$), but the difference was statistically marginal [$t(181) = .61$, $p = .08$].

Discussion

The findings add to the body of research that suggests the brief GMS is both a reliable and valid measure and adds to the literature on mattering within a sample of distressed breast cancer survivors. The measure has good internal consistency. Data supported unidimensional structure of the GMS scale with a method factor. The scale appears to be valid as it correlates in the expected direction with the other factors within the nomological network, including positive affect, depressive symptoms, functional and physical quality of life, meaning in life, and self-esteem. Further, as expected, mattering to others is positively correlated with social support, but it also accounts for unique variance in a range of psychosocial outcomes, suggesting it could be an important target for interventions among women with breast cancer. Comparable to previous research, married women reported higher levels of mattering than unmarried women [22]. However, significant group differences were not found for employment status within this population. Additionally, as predicted, women with a lower sense of mattering to others were significantly more likely to utilize psychological therapy post-diagnosis than women with a higher sense of mattering to others. These outcomes point towards the potential for future research identifying cancer survivors

with a low sense of mattering and designing interventions to boost connectedness within this population.

The GMS has many desirable qualities for inclusion in psychosocial cancer research. The brevity of the measure minimizes participant burden, especially if a large set of measures are being administered in a study. Even after controlling for social support, the measure significantly correlates with positive affect, meaning in life, functional quality of life, and self-esteem, so the GMS may be especially useful if these outcomes are important to the research question. Although mattering was not significantly correlated with physical quality of life, depression and anxiety after controlling for social support, there are many factors to consider. For instance, mattering to others could be a prerequisite or antecedent to social support, exerting an indirect influence on distress. Another consideration is that the 5-item GMS may not be capturing all of the dimensions of mattering. A longer, 24-item scale measuring mattering to others includes three dimensions: awareness, importance and reliance [21]. The GMS does include at least one question for each of these dimensions. Thus, the GMS is a useful scale, as its brevity will reduce patient burden, and it is still shown to be predictive and to capture the construct of mattering.

A positive association between social support and mattering to others was expected because often the individuals to whom we matter are a source of support, such as a spouse. This association may explain the lack of a relationship between anxiety/depression and mattering. However, a sense of mattering is not identical to social support and may influence quality of life in unique ways. For example, a woman with breast cancer may have a child who is a source of meaning, inspiration to live, and to whom she matters, but she would not seek support or advice from the child. Similarly, this same woman may matter to her ailing parents who depend on her in many ways but due to their own illnesses may not be able to reciprocate her support. Alternatively, persons might seek support form a therapist, but not feel they matter to the therapist. The findings support this theorized relationship between social support and mattering, and also provide evidence that that the two constructs are unique.

The findings from this investigation have implications for future research on the validity of the GMS measure as well as the overall construct of mattering to others within a cancer population. Further investigation on the validity of this measure in the target population is warranted. Additional research to explore the mental and physical health outcomes related to the construct of mattering is also needed. Expanding the mattering literature within the target population could lead to testable theories and frameworks for interventions that may bolster a sense of mattering and improve psychosocial outcomes, such as quality of life. Research calls for oncology nurses to work towards understanding the unique components of meaning in an

individual patient's life in order to aid in the exploration of how cancer fits into the patient's life [65, 66]. Building on this, helping patients identify to whom they matter could aid in finding meaning and coping with the existential plight of cancer. Often, time and financial resources are limited, yet the simple act of identifying important people in a patient's life could foster a sense of belonging and potentially improve outcomes. Since mattering has not been fully explored within the cancer population more research is needed to better understand the extent to which mattering to others may improve treatment and recovery outcomes. Thus, utilizing this brief scale in future studies within this population could further the understanding of the beneficial psychosocial effects mattering to others may have on cancer survivors.

Several limitations should be acknowledged. The study did not use a second measure of mattering to validate the construct. Future studies could include two mattering measures within this population to further verify the reliability and validity of the brief GMS. However, it is known the GMS correlates with the Mattering to Others Questionnaire from other research [26]. Another limitation is the select population, as breast cancer may be different than other cancer populations. The population within this study was female with a relatively high level of education and baseline distress, and was predominantly white. Relatively high levels of mattering were reported by this sample. It is also known that women have higher levels of mattering compared to men [23]. Future research should investigate cancer populations that include greater variance in socioeconomic status and gender to provide a more robust understanding of mattering to others within diverse cancer populations.

Conclusion

The results provide evidence that the brief GMS is a reliable and valid measure within a sample of women with breast cancer. Additional psychometric research on the measure within this and other cancer populations would be beneficial, as would research on mattering to others in relation to psychosocial interventions and outcomes with cancer survivors. The brief GMS would be a recommended tool to further the investigation and understanding of this important factor, mattering to others, which could lead to potentially impactful cancer specific interventions.

Compliance with ethical standards

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