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Comparing Disease-Specific and Generic Quality of Life in Korean Breast Cancer Survivors Using the FACT-B and QLI: The Importance of Instrument Selection

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Abstract

Background: Quality of life (QOL) has become an important indicator for evaluating patients' symptoms and their overall satisfaction with life. Thus, examining QOL is essential for fully understanding the life satisfaction of breast cancer survivors (BCS). However, selecting the appropriate instrument for QOL measurement is challenging, and few studies have compared disease-specific and generic QOL measures and how they reflect the impact of cancer-related symptoms on QOL in BCS. We examined QOL in BCS using both disease-specific and generic instruments and compared their representation of the QOL impacts of anxiety, depression, sleep, fatigability, and posttraumatic growth. **Methods:** This study involved analysis of follow-up data for an exercise intervention called the BLESS (Better Life after cancer, Energy, Strength, and Support) program, which included 40 BCS treated at 1 medical center in South Korea. Their QOL was assessed using both the Functional Assessment of Cancer Therapy-Breast (FACT-B) and Quality of Life Index (QLI). **Results:** Both FACT-B and QLI total scores revealed that Korean BCS had low levels of QOL. Furthermore, both FACT-B and QLI total scores were significantly related to anxiety, depression, sleep, fatigability, and posttraumatic growth in the participants. Notably, multivariate regression analysis of FACT-B and QLI total scores showed different predictors for QOL: with the FACT-B, depression was the only significant predictor, while with the QLI, posttraumatic growth was the only significant predictor. **Conclusion:** The selection of a given QOL instrument may affect the overall findings and interpretation of the impacts of related symptoms. The FACT-B should be considered for studies of symptoms such as depression, while the QLI is more appropriate for examining overall QOL and posttraumatic growth.

Keywords

breast neoplasms, depression, fatigue, measure, posttraumatic growth, quality of life, symptom

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Introduction

Quality of life (QOL) is a significant concern for breast cancer survivors (BCS) and is commonly used as a primary outcome in health research.[1-3] Although QOL improves over time after breast cancer diagnosis,[4] compared to healthy women, BCS exhibit worse QOL, and they still suffer from various cancer-related symptoms such as sleep disturbance, cognitive impairment, and fatigability.[5-7] In addition, BCS who received chemotherapy and who had

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comorbidities, lower social support, and more unmet needs report poorer QOL.[4] Because QOL is known to be closely related to multiple individual factors and various cancer symptoms,[8-11] it has become an important indicator in evaluating survivors' symptoms and their overall satisfaction with life.

The National Cancer Institute defines QOL as overall enjoyment of life, and many researchers evaluate particular aspects of peoples' perception of well-being and their capability to engage in the activities of daily life.[12] A wide variety of QOL instruments is available for use with BCS, and these instruments are broadly classified as disease-specific and generic.[13-14] Assessing multiple aspects of QOL, including physical, psychological, social, and spiritual aspects, is essential, but for both researchers and healthcare providers, selecting the most appropriate QOL instrument can be a challenge. Because findings regarding associations between cancer-related symptoms and QOL may differ depending on which instrument is applied, it is necessary to have a better understanding of the differences between QOL instruments in terms of their items, scope, and weight.

Few studies have compared disease-specific and generic QOL instruments and how they reflect the QOL impacts of cancer-related symptoms in BCS. To provide insights into these matters for the benefit of researchers and healthcare providers alike, two QOL instruments were selected for comparative analysis because they are known to be reliable and valid and because they emphasize different QOL aspects—disease-specific and generic. First, the Functional Assessment of Cancer Therapy-Breast (FACT-B) is a sensitive, disease-specific instrument for measuring the QOL of BCS. FACT-B incorporates items that specifically address the values and concerns of BCS. [15] Second, the Quality of Life Index (QLI)—Generic version was developed in 1984 by Powers and Ferrans to measure overall life satisfaction and is used to measure various aspects of life as a whole.[16] The present study compared the FACT-B and QLI and their representations of the relationships between QOL and cancer-related symptoms in BCS.

Methods

Study Design and Sample

This study reports follow-up data from an exercise intervention called the BLESS (Better Life after cancer, Energy, Strength, and Support) program.[17] Eligible women were aged 20 to 69 years; had been diagnosed with stage I, II, or III breast cancer; had completed surgery and chemotherapy; and had moderate or higher cancer-related fatigue (numeric rating scale score ≥4). Out of the 50 participants allocated to the experimental/control group, a total of 40 women who completed the 12-month follow-up survey after participation in the 12-week BLESS program were included in the study. The institutional review board of the authors' university approved this study (#4-2017-0164) before data collection began.

Measures

Disease-specific and generic QOL. To assess disease-specific QOL, the Korean version of the FACT-B instrument (version 4) was used to measure disease-specific QOL.[18] The instrument consists of 37 items in 4 domains that assess physical well-being, social/family well-being, emotional well-being, and functional well-being, and in a breast cancer subscale that constitutes the fifth domain. The instrument uses a 5-point Likert scale ranging from 0 to 4, and a higher score indicates higher QOL. The internal consistency for the Korean version of the FACT-B total score was high (alpha coefficient = .90) in a previous Korean study.[18] In the present study, the internal consistency for the FACT-B total score was also high (alpha coefficient = .859), with domain alpha coefficients ranging from .768 to .921.

To measure generic QOL, the generic version of the QLI developed in 1984 by Powers and Ferrans was used. This instrument consists of 33 items in the health and functioning, socio-economic, psychological/spiritual, and family domains. The items are scored on a 6-point Likert scale ranging from 1 to 6, and a higher score indicates better QOL. In a previous study of Korean BCS, the internal consistency of the Korean version of the QLI was high (alpha coefficient = .95).[6] In the present study, the QLI's internal consistency was also high, with domain alpha coefficients ranging from .800 to. 915.

Other data variables. Participants' demographic and clinical variables were collected through a self-reported survey. To collect cancer-related symptoms, both anxiety and depression were assessed using the Korean version of the Hospital Anxiety and Depression Scale (HADS).[19] The HADS consists of 14 items, divided into two 7-item subscales of anxiety and depression. Responses range from 0 to 3, and higher scores indicate greater levels of anxiety and depression. Sleep quality was assessed using the Korean version of the Pittsburgh Sleep Quality Index (PSQI),[20] which contains 19 items with scores ranging from 0 to 3. Fatigability was assessed using the Korean version of the Pittsburgh fatigability Scale (K-PFS).[21,22] This instrument is a 10-item scale that measures the degree to how they readily feel physical and mental fatigability according to various activities of fixed type, intensity, and duration. Response scores range from 0 to 5, and a higher K-PFS score means a high fatigue level. Posttraumatic growth was measured by the Korean version of the Post Traumatic Growth Inventory (K-PTGI). The K-PTGI is a 21-item scale that assesses the positive outcomes reported by individuals who experienced cancer. Response scores range from 0 to 5, and a higher K-PTGI score means more positive change after cancer experience.

The reliability and validity of the instruments used have been reported in detail elsewhere.[23]

Statistical Analysis

Descriptive analyses were applied to summarize patients' general and clinical characteristics, QOL, and anxiety, depression, sleep, fatigability, and posttraumatic growth. The analysis focused on detecting statistical associations among variables using the χ^2 test. In addition, the independent samples t-test and analysis of variance (ANOVA) were used to compare mean scores for continuous variables. Multivariate regression analysis was applied to identify predictors of QOL. All data were analyzed using STATA version IC 16.0.

Results

Sample Characteristics

Table 1 summarizes the participants' general and clinical characteristics. The mean age of the participants was 49 years, with ages ranging from 33 to 67. Most participants (n = 35, 87.50%) had been diagnosed with breast cancer within the past 3 years, and stage II was the most common cancer stage (n = 25, 62.5%). Almost all participants received chemotherapy (n = 39, 97.5%), and 36 (90%) received radiotherapy (n = 36, 90%).

Comparison of FACT-B and QLI

The mean total FACT-B score was 92.61 (SD = 22.51). The mean subdomain scores were as follows: physical well-being, 18.73 (SD = 7.20); social/family well-being, 16.93 (SD = 5.38); emotional well-being, 16.35 (SD = 4.30); functional well-being, 17.49 (SD = 5.05); and breast cancer subscale, 23.13 (SD = 6.84). Participants with stage 2 cancer showed the lowest mean total FACT-B score ($M = 86.04$, SD = 24.38), and there was a statistically significant difference between stages as determined by one-way ANOVA ($F(2, 37) = 3.48$, $P < .05$). Participants who received mastectomy showed a higher mean total FACT-B score than participants who received lumpectomy (mean: 88.71 vs 106.06, $t(38) = -2.125$, $P < .05$). Except for cancer stage and surgery type, the total FACT-B results showed no significant differences with respect to participants' general and clinical characteristics.

Regarding the QLI, the mean total QLI score was 18.03 (SD = 3.87). The mean subdomain scores were as follows: health and functioning, 17.24 (SD = 4.35); socio-economic, 17.90 (SD = 3.13); psychological/spiritual, 18.61 (SD = 4.39); and family 19.59 (SD = 5.05). The total QLI results showed no significant differences with respect to participants' general and clinical characteristics.

Table 1. Demographics and Clinical Characteristics (N = 40).

	Mean ± SD (range)
Characteristic	N (%)
Age (years)	48.8 ± 7.49 (33-67)
30-39	3 (7.5)
40-49	21 (52.5)
50-59	14 (35.0)
60-69	2 (5.0)
Marital status	
Married	27 (67.5)
Unmarried	13 (32.5)
Income, 10 000 KRW (US dollar)	
<300 ($2660)	20 (50.0)
≥300 ($2660)	20 (50.0)
Employment status	
No	25 (62.5)
Yes	15 (37.5)
Education level	
<Middle school	2 (5.0)
High school	21 (52.5)
≥College	17 (42.5)
Children	
No	9 (22.5)
Yes	31 (77.5)
Stage	
I	10 (25.0)
II	25 (62.5)
III	5 (12.5)
Surgery type	
Mastectomy	9 (22.5)
Lumpectomy	31 (77.5)
Time since diagnosis	
<2	16 (40.0)
2-3	19 (47.5)
≥3	5 (12.5)
Chemotherapy	
No	1 (2.5)
Completed	39 (97.5)
Radiation therapy	
None	4 (10.0)
Past	36 (90.0)
Endocrine therapy	
No	17 (42.5)
Yes	23 (57.5)
Target therapy	
No	25 (62.5)
Yes	14 (35.0)
Unknown	1 (2.5)

Abbreviations: KRW, Korean won (1110 KRW = approximately 1 US dollar).

Associations Among FACT-B- and QLI-Related Symptoms

Table 2 presents the correlations of FACT-B and QLI total scores with cancer-related symptoms. FACT-B and QLI

Table 2. Correlation of FACT-B and QLI Scores With Cancer-Related Symptoms.

	FACT-B	QLI
Anxiety	–.732***	–.611***
Depression	–.755***	–.626***
Sleep disturbance	–.565***	–.532***
Physical fatigability	–.441**	–.505**
Mental fatigability	–.397*	–.375*
Posttraumatic growth	.421**	.501**

Abbreviations: FACT-B, Functional Assessment of Cancer Therapy-Breast; QLI, Quality of Life Index.
*$P < .05$, **$P < .01$, ***$P < .001$.

showed similar correlation patterns. The total mean score for FACT-B was correlated with anxiety ($r = -.732$, $P < .001$), depression ($r = -.755$, $P < .001$), sleep disturbance ($r = -.565$, $P < .001$), physical fatigability ($r = -.441$, $P < .01$), mental fatigability ($r = -.397$, $P < .05$), and posttraumatic growth ($r = .421$, $P < .01$). The total mean score for the QLI was also correlated with anxiety ($r = -.611$, $P < .001$), depression ($r = -.626$, $P < .001$), sleep disturbance ($r = -.532$, $P < .001$), physical fatigability ($r = -.505$, $P < .01$), mental fatigability ($r = -.375$, $P < .05$), and posttraumatic growth ($r = .501$, $P < .01$).

The specific domains of the FACT-B and QLI also showed correlations with cancer-related symptoms. In the case of the FACT-B's domains, the mean scores for both emotional well-being and the breast cancer subscale correlated with anxiety ($r = -.735$, $P < .001$ and $r = -.565$, $P < .001$), depression ($r = -.531$, $P < .001$ and $r = -.584$, $P < .001$), sleep disturbance ($r = -.511$, $P < .01$ and $r = -.565$, $P < .001$), physical fatigability ($r = -.327$, $P < .05$ and $r = -.418$, $P < .05$), mental fatigability ($r = -.372$, $P < .05$ and $r = -.411$, $P < .05$), and posttraumatic growth ($r = .316$, $P < .05$ and $r = .386$, $P < .05$). The mean score for physical well-being was correlated with anxiety ($r = -.624$, $P < .001$), depression ($r = -.522$, $P < .001$), sleep disturbance ($r = -.505$, $P < .01$), physical fatigability ($r = -.444$, $P < .01$), and mental fatigability ($r = -.419$, $P < .01$). Also, the mean score for social/family well-being was correlated with anxiety ($r = -.392$, $P < .05$), depression ($r = -.593$, $P < .001$), and posttraumatic growth ($r = .342$, $P < .05$). Lastly, the mean score for functional well-being was correlated with anxiety ($r = -.565$, $P < .001$), depression ($r = -.748$, $P < .001$), sleep disturbance ($r = -.514$, $P < .01$), and posttraumatic growth ($r = .479$, $P < .01$).

Regarding the domains of the QLI, the mean scores for both health and functioning and socio-economic were correlated with anxiety ($r = -.580$, $P < .001$ and $r = -.578$, $P < .001$), depression ($r = -.624$, $P < .001$ and $r = -.472$, $P < .01$), sleep disturbance ($r = -.585$, $P < .001$ and $r = -.351$, $P < .05$), physical fatigability ($r = -.534$, $P < .001$ and $r = -.514$, $P < .01$), mental fatigability ($r = -.396$, $P < .05$ and $r = -.350$, $P < .05$), and posttraumatic growth ($r = .454$, $P < .01$ and $r = .500$, $P < .01$). In addition, the mean scores for both the psychological/spiritual and family domains were correlated with anxiety ($r = -.584$, $P < .001$ and $r = -.476$, $P < .01$), depression ($r = -.583$, $P < .001$ and $r = -.521$, $P < .001$), sleep disturbance ($r = -.448$, $P < .01$ and $r = -.412$, $P < .05$), physical fatigability ($r = -.393$, $P < .05$ and $r = -.397$, $P < .05$), and posttraumatic growth ($r = .443$, $P < .01$ and $r = .455$, $P < .01$).

Multiple Regression Analyses of FACT-B and QLI

Table 3 presents the main factors related to FACT-B and QLI total scores, and the multivariable regression revealed different QOL predictors for the FACT-B and QLI. The model for the FACT-B was statistically significant ($F = 11.71$, $P < .001$; $R^2 = .730$), and we found that depression was the only factor that influenced QOL measured with the FACT-B ($B = -3.163$, SE = 1.019, $P < .01$). However, posttraumatic growth was the only factor that influenced QOL measured with the QLI ($B = 2.472$, SE = .756, $P < .01$), and the model for the QLI was statistically significant ($F = 9.37$, $P < .001$; $R^2 = .684$).

Regarding the domains of the FACT-B, we found that no factors influenced QOL measured in terms of physical well-being and the breast cancer subscale. The model for social/family well-being was statistically significant ($F = 5.47$, $P < .001$; $R^2 = .558$), and depression ($B = -.993$, SE = .316, $P < .01$), sleep disturbance ($B = .754$, SE = .283, $P < .05$), and posttraumatic growth ($B = 3.354$, SE = 1.335, $P < .05$) were the factors that influenced QOL measured in terms of this domain. Also, the model for emotional well-being was statistically significant ($F = 5.63$, $P < .001$; $R^2 = .565$), and anxiety was the only factor that influenced QOL ($B = -.737$, SE = .267, $P < .05$). Lastly, the model for functional well-being was statistically significant ($F = 7.99$, $P < .001$; $R^2 = .648$), and depression ($B = -.890$, SE = .272, $P < .01$) and posttraumatic growth ($B = 2.549$, SE = 1.147, $P < .05$) were the factors that influenced QOL.

As for the QLI's domains, we found that no factors influenced QOL measured in terms of the psychological/spiritual domain. The model for health and functioning ($F = 8.61$, $P < .001$; $R^2 = .665$) showed that posttraumatic growth was the only factor that influenced QOL ($B = 2.026$, SE = .860, $P < .05$), and the model for the socio-economic domain ($F = 8.44$, $P < .001$; $R^2 = .661$) showed that both anxiety and posttraumatic growth influenced QOL ($B = -.465$, SE = .158, $P < .01$ and $B = 2.702$, SE = .636, $P < .001$). Lastly, the model for family ($F = 4.49$, $P < .01$; $R^2 = .509$) showed that posttraumatic growth was the only factor influencing QOL measured in terms of this domain ($B = 3.514$, SE = 1.278, $P < .05$).

Table 3. Multiple Regression Analyses of FACT-B and QLI.

Quality of life	*B*	SE	*t*	*p*
FACT-B				
(Constant)	104.720	20.588	5.09	.000
Anxiety	−1.144	1.071	−1.07	.295
Depression	−3.163	1.019	−3.10	.005
Sleep disturbance	.086	.912	0.09	.926
Physical fatigability	.107	.625	0.17	.866
Mental fatigability	−.523	.640	−0.82	.421
Posttraumatic growth	7.958	4.303	1.85	.076
QLI				
(Constant)	15.312	3.616	4.24	.000
Anxiety	−.267	.188	−1.42	.168
Depression	−.291	.179	−1.62	.117
Sleep disturbance	.017	.160	0.11	.914
Physical fatigability	−.131	.110	−1.19	.245
Mental fatigability	.070	.112	0.62	.540
Posttraumatic growth	2.472	.756	3.27	.003

Abbreviations: FACT-B, Functional Assessment of Cancer Therapy-Breast; QLI, Quality of Life Index.

Discussion

Our study contributes to understanding the differences between disease-specific and generic QOL instruments and their usefulness for identifying predictors for QOL. Our findings indicate that the choice of QOL instrument may affect the results of a given study and thus the interpretation of the impacts of cancer-related symptoms. On this basis, we think that researchers and health care providers alike should carefully consider the aims of their study and the characteristics of the variables they are investigating to ensure that they align with the selected QOL instrument, recognizing that selection of a QOL instrument may inadvertently affect the accuracy of capturing the true nature of participants' QOL.

Interestingly, our findings showed different predictors of QOL depending on the type of the QOL instrument applied. FACT-B, a disease-specific type of instrument, indicated that depression was the only significant predictor of QOL in our study sample. In a recent review,[24] the global prevalence of depression in breast cancer patients was reported to be 32.3%, and another recent study reported that depression was a significant predictor of QOL in breast cancer patients.[25] Consistent with those findings, our FACT-B results indicated that depression was a predictor of QOL, but this was not the case with the QLI results. With respect to the multivariate regression for the QLI, posttraumatic growth was the only factor significantly influencing QOL. Similarly, a recent systematic review of 37 studies (involving 7954 adult cancer survivors) found that posttraumatic growth had a positive association with QOL.[26] Thus, posttraumatic growth after cancer may be an essential facilitator of improvements in coping abilities and QOL in cancer survivors. The disparity in QOL-related results between the FACT-B and QLI illustrates the degree to which different QOL instruments can emphasize particular symptoms and, depending on the purpose of an instrument, the way in which it can influence study results. Thus, using disease-specific QOL instruments with cancer patients in the acute phase of active treatment can help to generate more sensitive results regarding the symptoms that they actually experience. In contrast, using generic QOL instruments, such as the QLI, may be more appropriate for identifying overall life satisfaction in disease-free survivors. In future studies of cancer patients and/or survivors, measurement of QOL with attention to selection of the most appropriate instrument can help researchers more accurately measure and interpret the QOL impacts of cancer-related symptoms.

Generally, disease-specific QOL instruments such as the FACT-B are developed to specifically evaluate disease-related symptoms and functional status components that impact QOL.[27] For example, a domain of the FACT-B specifically deals with breast cancer-related concerns, such as hair loss, sexual issues, and pain,[27] and this domain can be helpful in identifying cancer- or treatment-related side-effects and the efficacy of cancer care. On the other hand, generic QOL instruments, such as the QLI, are developed to assess life satisfaction with less weight on specific disease-related symptoms.[16] Thus, selection of a particular QOL instrument can influence the researcher's ability to capture specific aspects of QOL, a multidimensional concept. For example, a previous study of differences in what QOL instruments measure compared 3 instruments: the Functional Assessment of Cancer Therapy-General (FACT-G), European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), and SF-36 Health Survey (SF-36).[28] The comparison revealed that a larger proportion of SF-36 items addressed functional status, whereas the FACT-G and QLQ-C30 showed larger proportions of items addressing symptom status. Another study also showed that the FACT-B emphasized the emotional well-being domain of QOL in breast cancer women, while the EORTC Breast Cancer-Specific Quality of Life Questionnaire (EORTC QLQ-BR23) placed a greater weight on physical function.[29] Given the different emphases of various QOL instruments and recognizing the varying intentions underlying instrument development, researchers and health care providers should be aware of these nuanced but important differences and need to match their own research purposes with the QOL instrument that is most sensitive to their variables of interest.

Among the 5 FACT-B domains, we found that the emotional domain showed the lowest scores, while the health and functioning domain had the lowest scores among the QLI's 4 domains. In a previous study involving Korean

breast cancer patients undergoing chemotherapy (63.5% received less than 6 months of chemotherapy and 36.5% more than 6 months), the FACT-B scores for the physical and emotional well-being domains were similar to our FACT-B findings,[30] but our FACT-B results included higher scores for the social well-being, functional well-being, and breast cancer subscale domains. In contrast, a previous study[6] that applied the QLI to Korean BCS (mean time since diagnosis: 7.10 years; SD = 4.54) showed higher scores for all 4 domains than were found in our study. Because our study participants had finished active treatment relatively recently (mean time since diagnosis: 2.35 years; SD: 0.863), the 3 domains of FACT-B might have had relatively high scores and all domains of the QLI might have been relatively low, as the treatment-related effects may have subsided.

When the results of previous QOL studies for Korean breast cancer patients are considered, our FACT-B and QLI findings seem to be reasonable in terms of the overall QOL scores. However, when our findings are compared to the results of American studies using the same QOL instruments, the QOL scores of Korean BCS were considerably lower. For example, 1 American QOL study that used the FACT-B with BCS diagnosed with ductal carcinoma in situ (21.8%) and invasive breast cancer (78.2%) showed higher scores (ranging from 20.5 to 27.3) for all FACT-B domains than our own.[31] In addition, a previous study comparing QOL differences between American and Chinese BCS also reported that American BCS had higher scores for all 5 domains than BCS in our study, and Chinese BCS had higher scores for 3 domains (physical well-being, social/family well-being, and breast cancer subscale) than BCS in our study.[32] Similarly, a previous American study of BCS using the QLI instrument showed higher scores (ranging from 22.6 to 24.7) for all domains than our findings.[33] Jang et al. (2022) pointed out that QOL tends to be lower among Korean BCS compared to their American counterparts.[6] The relatively low QOL scores in our study compared to previous research likely occurred because our study included only BCS with moderate or higher levels of fatigue (numerical rating scale ≥ 4). Considering that Korean breast cancer patients have been reported to have lower QOL, both disease-specific and general, assessment of QOL is an essential component of cancer care in Korea, and future studies should determine which QOL components are significantly lower in Korea and which QOL predictors should be given close attention.

This study has some limitations that should be considered. Because the 2 QOL instruments compared were applied at a single point in time, we could not identify patterns of QOL over the long term or changes in their relationships with cancer-related symptoms. To reveal the patterns of cancer-related symptoms and QOL during cancer survivorship, further follow-up comparative assessments would be necessary. In addition, because the current study was an extension of a past interventional study, our analysis was limited to a comparison of QOL results for a small subgroup of 40 participants, with only 1 (5%) who did not receive chemotherapy. Thus, future studies should attempt to recruit larger samples from multiple cancer centers in order to enhance the generalizability of the results.

Conclusion

Our findings for disease-specific and generic QOL instruments confirm that the predictors identified for QOL may vary depending on the instrument applied. These findings emphasize the importance of selecting QOL instruments appropriate to the research objectives, understanding the reasons for the development of particular QOL instruments, and identifying the specific QOL components measured and their respective weights. Only with application of the appropriate QOL instrument can the accuracy and sensitivity of QOL research findings be maximized. In future studies, efforts to match the instrument purpose with the research purpose will enhance detailed identification of cancer patients' symptoms as well as their overall life satisfaction.

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