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Quality of Life Trajectories After Diagnosis of Gynecologic Cancer: A Theoretically-Based Approach

Brian D Gonzalez, PhD¹, Sharon L Manne, PhD¹, Jerod Stapleton, PhD¹, Shannon Myers-Virtue, PsyD², Melissa Ozga, DO³, David Kissane, MD^{3,4}, Carolyn Heckman, PhD⁵, and Mark Morgan, MD⁶

¹Rutgers Cancer Institute of New Jersey

²Temple University School of Dentistry

³Memorial Sloan Kettering Cancer Center

⁴Monash University

⁵Fox Chase Cancer Center

⁶University of Pennsylvania School of Medicine

Abstract

Purpose—The course of quality of life after diagnosis of gynecologic cancer is not well understood. We aimed to identify subgroups of gynecologic cancer patients with distinct trajectories of quality of life outcomes in the 18-month period after diagnosis. We also aimed to determine whether these subgroups could be distinguished by predictors derived from Social-Cognitive Processing Theory.

Methods—Gynecologic cancer patients randomized to usual care as part of a psychological intervention trial (NCT01951807) reported on depressed mood, quality of life, and physical impairment soon after diagnosis and at five additional assessments ending 18 months after baseline. Clinical, demographic, and psychosocial predictors were assessed at baseline, and additional clinical factors were assessed between 6–18 months after baseline.

Results—A two-group growth mixture model provided the best and most interpretable fit to the data for all three outcomes. One class revealed subclinical and improving scores for mood, quality of life, and physical function across 18 months. A second class represented approximately 12% of patients with persisting depression, diminished quality of life, and greater physical disability. Membership of this high-risk subgroup was associated with holding back concerns, more intrusive thoughts, and use of pain medications at the baseline assessment ($p < .05$).

Conclusions—Trajectories of quality of life outcomes were identified in the 18-month period after diagnosis of gynecologic cancer. Potentially modifiable psychosocial risk factors were

Corresponding concerning this manuscript should be addressed to Brian D. Gonzalez, Ph.D.: Rutgers Cancer Institute of New Jersey, 195 Little Albany Street, New Brunswick, NJ 08903 Brian.Gonzalez@Rutgers.edu.

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identified that can have implications for preventing quality of life disruptions and treating impaired quality of life in future research.

Keywords

gynecologic neoplasms; quality of life; depression; physical impairment; growth mixture modeling

Introduction

Gynecologic cancer and its treatment adversely affect quality of life (QOL) outcomes, such as mood, health-related quality of life (HRQOL), and physical functioning. Although overall QOL improves over time in most gynecologic cancer patients [1, 2], many survivors continue to report significant depressive symptoms, reduced HRQOL, and physical impairment [3].

One important gap in the literature is data to predict which women diagnosed with gynecologic cancer are at greatest risk for these negative sequelae. No studies to date have identified subgroups of gynecologic cancer patients with distinct QOL trajectories. These analyses can identify subsets of patients who exhibit similar patterns in QOL over time and can provide a more detailed understanding than what is possible with typical longitudinal analyses. Understanding the predictors of and changes in QOL outcomes can help clinicians identify patients in need of psychological intervention and targets for intervention.

It is important to examine relevant theoretical models when identifying risk factors for impaired QOL. One relevant theory is Social-Cognitive Processing Theory [4, 5], which posits that successfully adapting to a stressful situation involves sharing one's concerns with others and assimilating life experience into one's world view (social and cognitive processing, respectively). With respect to social processing, many cancer patients hold back from disclosing their concerns due to unsupportive behavior they experience from others (e.g., criticizing patients) [6–13]. Uns supportive behaviors from friends and family as well as holding back from sharing concerns are associated with worse QOL [6, 14–16]. QOL in cancer patients has also been linked with cognitive processes, including more benefit finding, perceived coping efficacy, using adaptive coping strategies, as well as fewer intrusive thoughts [2, 6, 17–19]. Thus, social and cognitive processing constructs should be studied as predictors of QOL trajectories in gynecologic cancer patients.

In addition, it is important to consider the impact of clinical factors when examining change over time in QOL. Factors such as disease stage at diagnosis and disease recurrence have been shown to impact QOL [20–22]. However, evidence is mixed with some studies showing no association between clinical factors and QOL [23, 24].

This study aimed to identify subgroups of gynecologic cancer patients with distinct trajectories in QOL in the 18 months after diagnosis. We also aimed to identify demographic, clinical, and psychosocial predictors of subgroup membership. We hypothesized that a worse QOL trajectory would be associated with greater holding back, greater unsupportive behavior from family and friends, less benefit finding, lower coping efficacy, more intrusive thoughts, more avoidance, and less use of adaptive coping strategies.

Method

Participants

Participants were women randomized to the usual care in a randomized clinical trial evaluating two psychological interventions for gynecologic cancer patients (NCT01951807). Usual care consisted of psychosocial care offered to patients in the medical center where they were being treated (e.g., psychiatric consultation, psychosocial care, social work services). Eligible women had primary gynecologic cancer (ovarian, endometrial/uterine, cervical, vulvar, or fallopian tube) and were undergoing treatment at one of seven hospitals in the northeastern United States. Participants were required to: be 18 years of age, be diagnosed within the previous 6 months, be ambulatory and capable of self-care (KPS 80 or ECOG 1), speak English, have no hearing impairment, and live within a 2-hour commute from a recruitment center.

Procedure

Eligible participants were identified via chart review, sent a letter describing the study, and contacted by study staff in person or by phone. Participants signed a consent form approved by an Institutional Review Board. Self-report questionnaires were completed at study entry, five weeks, nine weeks, six months, 12 months, and 18 months after study entry. Participants were paid \$15 for each survey completed. Outcomes were assessed at each assessment and potential predictors were assessed at baseline with the exception of clinical factors at or after the six-month assessment.

Measures

Demographics and Clinical Factors: Participants completed demographics questionnaires that assessed age, racial/ethnic background, education, marital status, and household income. Chart reviews assessed the following baseline variables: type of cancer, time since diagnosis, presence of metastasis at diagnosis, cancer treatment history, menopausal status, and use of medication for pain, depression, anxiety, and sleep disturbance. In addition, the presence of disease progression and/or recurrence as well as treatment with chemotherapy and/or radiation beyond six months after diagnosis was assessed in follow-up chart reviews.

Outcomes

Depression: The Beck Depression Inventory (BDI) is a 21-item measure of depressive symptoms [25]. Participants are asked to endorse statements about feelings such as sadness, loss of pleasure, and irritability on a 4-point scale. Higher scores indicate greater depressive symptomatology. The BDI is widely used in cancer populations and has demonstrated adequate validity and reliability [26, 27]. Internal consistency in the current study was adequate (α range=.84–.92). Scores 9, 10–18, 19–29, and 30–63 suggest minimal, mild, moderate, and severe depressive symptoms, respectively [27]. We used a cut score of 0.5 standard deviations (3.6 points in this sample) to determine clinically-important change in depressive symptomatology [28].

Health-Related Quality of Life: The Functional Assessment of Cancer Therapy (FACT-G) assesses HRQOL with items on a 5-point scale [29]. Items are summed to produce an overall HRQOL score, with higher scores indicating better HRQOL. The FACT-G is widely used in cancer populations and has demonstrated adequate validity and reliability [29–32]. Internal consistency in the current study was adequate (α range=.91–.94). A normative cancer population score (80) and a minimally important difference score (7) have been established [33, 34].

Physical Impairment: The 26-item Physical Function subscale of the Cancer Rehabilitation Evaluation System asks respondents to report on physical limitations they experience on a 5-point scale [35]. Scores are averaged to produce a Physical Impairment summary score, with higher scores indicating greater physical impairment. This scale is widely used in cancer populations and has demonstrated adequate validity and reliability [35–37]. Internal consistency in the current study was adequate (α range=.92–.96). We used a cut score of 0.5 standard deviations (9.6 points in this sample) to determine clinically important change in depressive symptomatology [28].

Social Processing Constructs

Holding Back From Sharing Concerns: A 13-item scale was used that measures the degree to which participants hold back from family and friends [15]. Participants are asked to rate, on a 6-point scale, the degree to which they hold back from discussing issues of concern with friends and family. Scores are averaged to produce a total score, with higher scores indicating greater holding back. Internal consistency in the current study was adequate (α =.93).

Unsupportive Behaviors from Family and Friends: The Cancer Support Inventory is a 13-item scale that measures the degree to which family and friends respond to patients in ways that are unsupportive [38]. The measure asks respondents to rate the frequency of unsupportive responses. Scores are summed, with higher scores indicating greater unsupportive behavior from family and friends. Internal consistency in the current study was adequate (α =.99).

Cognitive Processing Constructs

Benefit Finding: The 17-item Benefit Finding Scale measures how much participants feel their cancer and its treatment have made positive contributions in their lives [39, 40]. Respondents are asked to rate their agreement with statements of possible benefits from cancer and its treatment. Scores are averaged to produce a summary score, with higher scores indicating greater benefit finding. Internal consistency in the current study was adequate (α =.94).

Coping Efficacy: A 17-item scale was used to measure confidence in coping skills on a 5-point scale [16]. Respondents are asked to rate their ability to practice various coping strategies on a 5-point scale. Scores are summed to produce a total score, with higher scores indicating greater coping efficacy. Internal consistency in the current study was adequate (α =.94).

Intrusion and Avoidance: The Intrusion and Avoidance subscales of the 15-item Impact of Events Scale were used. These subscales ask respondents to rate, on a 4-point scale, the frequency with which they experienced intrusive thoughts related to their cancer and avoided thinking about their cancer [41]. Scores are summed to produce summary scores, with higher scores indicating more intrusive thoughts and greater avoidance. Internal consistency in the current study was adequate (α range=.83–.87).

Positive reinterpretation and Planning Coping: The Positive Reinterpretation and Growth subscale and the Planning subscale of the COPE Inventory were used to measure use of adaptive coping strategies [42]. These subscales ask respondents to rate the degree to which they use several coping strategies on a 4-point scale. Scores are summed to produce a total score for each subscale, with higher scores indicating greater use of active coping strategies. Internal consistency in the current study was adequate (α range=.88–.91).

Statistical Analysis

Consistent with established best practices [43] and previous cancer research [19], changes over time in each outcome were modeled separately using a three-stage procedure. First, changes in outcomes across the study period were modeled using mixed models which identified whether the overall sample demonstrated change over time. Second, growth mixture modeling was used to iteratively extract classes of participants with similar trajectories of change over time. We examined the fit of each model using the -2 log likelihood ($-2LL$) ratio test, the Akaike information criterion (AIC), the Bayesian information criterion (BIC), the Vuong-Lo-Mendel Rubin likelihood ratio test, and Entropy. After the best-fitting, most theoretically relevant, and most interpretable model was obtained for each outcome, univariate logistic regression analyses were conducted to identify predictors of class membership. All risk factors that were significant at $p < .05$ were simultaneously included in multivariate logistic regression analyses to determine the contribution of these risk factors in predicting class membership.

Lastly, Cohen's kappa tests were conducted to determine whether there was significant overlap in membership across outcomes. This test produces a kappa value with values ranging from 0–1, with higher values indicating greater overlap.

Results

Participants

Participant demographic and clinical characteristics are presented in Table 1. Briefly, participants averaged 56 years of age, 77% were Caucasian, and 82% had attended some college. Most participants (73%) were married. The average time from diagnosis to consent was 3.8 months. Most were diagnosed with ovarian cancer (60%); the remainder were diagnosed with fallopian tube cancer (14%), endometrial cancer (12%), uterine cancer (7%), cervical cancer (5%), or other gynecologic cancers (2%). Most participants had stage III disease (76%). At the time of diagnosis, 89% were receiving chemotherapy and 7% were receiving radiotherapy. Most (73%) had completed treatment by their 6-month assessment.

Of the 1,545 potentially eligible patients approached, 82 were deemed ineligible before consent and 372 consented to the larger randomized clinical trial (25%). Of these, 124 were assigned to the Usual Care arm and included in this study. Common reasons for refusal included the patient felt she lived too far from the site (14%), was overwhelmed (10%), or would not benefit from the study (9%). Participants were younger than refusers ($M_{\text{participants}}=56$, $M_{\text{refusers}}=60$ years; $p<.01$), but these groups did not differ on time since diagnosis, type of cancer (ovarian vs. other), stage of disease, or race/ethnicity ($p>.10$).

Change Over Time in Outcomes

Visual and statistical analysis revealed that depression, HRQOL, and physical impairment were best described using linear rather than quadratic or cubic models. Growth mixture modeling resulted in two-class models selected as the final models for each outcome (see Table 2). Figure 1 provides estimated mean scores, and Table 3 provides parameter estimates for each outcome in each class. On average, the sample displayed significant decreases in depressive symptoms, increases in HRQOL, and decreases in physical impairment ($p<.01$).

Depressive Symptoms—Class 1 comprised 88% and Class 2 comprised 12% of the sample. Class 2 ($M=23.22$) reported significantly worse depressive symptomatology than Class 1 ($M=9.79$) at baseline, as evidence by their non-overlapping 95% confidence intervals in Table 3. The statistically significant slope for Class 1 indicates that depressive symptoms reduced by approximately 4 points over the course of the 18-month follow-up period Class 1. Class 2 did not report significant change over time in depressive symptoms.

Health-Related Quality of Life—Class 1 comprised 89% and Class 2 comprised 11% of the sample. At baseline, HRQOL was significantly worse for Class 2 ($M=48.04$) than for Class 1 ($M=74.54$). Class 1 also reported an improvement in HRQOL by approximately 11 points over the course of the 18-month follow-up period, but HRQOL did not change significantly over time in Class 2.

Physical Impairment—Class 1 comprised 88% and Class 2 comprised 12% of the sample. As with depression and QOL, Class 2 ($M=54.61$) reported significantly greater physical impairment at baseline than Class 1 ($M=23.17$). Class 1 reported physical impairment scores improving by approximately 13 points over the 18-month follow-up period, whereas Class 2 reported no change over time in physical impairment.

Predictors of Class Membership

Results from univariate analyses of potential demographic and clinical predictors are presented in Table 1. Results for psychosocial predictors are presented in Table 4.

Depression—Patients taking pain medication and those reporting more holding back, lower coping efficacy, more intrusive thoughts, and greater avoidance were more likely to be in depression Class 2. In addition to those results presented in Table 1, depression class membership was not associated with receipt of chemotherapy or radiation, disease progression, or recurrence at or after the six-month assessment ($p>.16$). Significant

predictors were entered simultaneously into a logistic regression model predicting depression class membership. The Nagelkerke R^2 value indicated that the model predicted 54% of the variability in depression class membership. Use of pain medication and more intrusive thoughts remained significant predictors ($p = .01$) and greater holding back marginally predicted ($p = .09$) membership in the class of women with worse depressive symptoms.

Health-Related Quality of Life—Patients taking pain medication as well as those reporting more holding back, less benefit finding, less coping efficacy, more intrusive thoughts, and greater avoidance were more likely to be in HRQOL Class 2. In addition, HRQOL class membership was not associated with receipt of chemotherapy or radiation, disease progression, or recurrence at or after the six-month assessment ($p = .16$). Significant predictors were entered simultaneously into a logistic regression model predicting HRQOL class membership. The model predicted 57% of the variability in HRQOL class membership. Use of pain medication, greater holding back, greater benefit finding, and more intrusive thoughts remained significant predictors of membership in the class of women with worse HRQOL ($p = .04$).

Physical Impairment—Patients taking pain medication, who were not married, and reporting more holding back, more intrusive thoughts, and greater avoidance were more likely to be in physical impairment Class 2. In addition, physical impairment class membership was not associated with receipt of chemotherapy or radiation, disease progression, or recurrence at or after the six-month assessment ($p = .09$). Significant predictors were entered into a logistic regression model predicting physical impairment class membership. The model predicted 39% of the variability in physical impairment class membership. Use of pain medication, greater holding back, and more intrusive thoughts remained significant predictors of membership in the class of women with worse physical impairment ($p = .02$).

Overlap in Class Membership

Participants' class memberships significantly overlapped across outcomes. Kappa values ranged from .55 ($SE = .12$) to .77 ($SE = .10$) and were all significantly greater than zero ($p < .05$). These results indicate that, for example, women in depression Class 1 were more likely to be HRQOL Class 1 than would be expected by chance.

Discussion

To our knowledge, this is the first study to examine subgroup trajectories of depressive symptoms, HRQOL, or physical disability following diagnosis of gynecological cancer or to examine the demographic, medical, and social and cognitive processing constructs associated with these subgroup trajectories. Three major findings warrant discussion. First, our outcomes were characterized by two subgroups. Most participants reporting levels of QOL that were within normal limits and improved during follow-up; a subgroup reported persistently low QOL. These findings are in line with previous longitudinal studies showing that, on average, QOL improves after diagnosis of gynecologic cancer [17]. Our study

extends this by identify a subgroup of women who report persistently elevated depressive symptoms, HRQOL below normal limits, and more physical impairment. This subgroup reported stable and clinically significant depressive symptoms as well HRQOL values that were significantly below norms and remained stable. The larger subgroup of patients reported subclinical levels of depressed mood and normative levels of HRQOL at baseline, and the improvement in both outcomes exceeded the cutoff for clinical significance. Normative values for the physical impairment measure are unavailable; however, a subgroup of patients reported significantly worse physical impairment than the larger group of gynecologic cancer patients and worse physical impairment than a previous cohort of newly diagnosed breast cancer patients [44].

The second major finding was that social and cognitive processing constructs were significant predictors of class membership. Our findings that holding back and intrusive thoughts were associated with worse HRQOL and physical impairment support Social-Cognitive Processing Theory in that they adversely impact psychosocial adaptation [13]. Benefit finding has not been well studied among women with gynecological cancer, but there is a growing body of work suggesting that finding benefit in the cancer experience is associated with better outcomes for cancer patients [45–48]. The lack of an association between benefit finding and depression and physical impairment trajectories suggest that the role of benefit finding may be less strong than holding back and intrusions for these outcomes. We also found that women taking pain medication were more likely to have worse QOL, which is consistent with the longstanding literature showing strong associations between pain and QOL among cancer patients [49–51]. These findings may be helpful to clinicians in identifying those gynecologic cancer patients at greatest risk of impaired QOL. In addition, future research should develop and test interventions targeted to patients who are at elevated risk of impaired QOL.

The third major finding was a significant overlap in membership across outcomes, suggesting, for example, that women with worse depression trajectories were also more likely to exhibit worse trajectories of HRQOL and physical impairment. This is a major strength of the current study, which is among the first to examine subgroup trajectories of *multiple* outcomes in any cancer population. The finding of a similar sized and significantly overlapping group of women with negative QOL trajectories, all of which were predicted by Social-Cognitive Processing Theory constructs, further supports this model in the context of cancer survivorship. Additional strengths of this study include examination of theoretically based predictors, a focus on a population with significant psychosocial needs, a clinically relevant follow-up period starting soon after diagnosis, and a long follow-up period.

This study also had some limitations. The timing of our assessments may have affected the trajectories observed. Most of participants had ovarian cancer and were White, well educated, and earned at least \$50,000 per year, thereby limiting the generalizability of these findings to other populations. Lastly, the sample consisted of women who agreed to participate in a psychological intervention trial.

With regard to clinical applications, psycho-oncology clinics could aim to predict QOL trajectories of gynecologic cancer patients using holding back concerns, intrusive thoughts,

and use of pain medications as predictors. Use of pain medications can be easily assessed via electronic medical records or by inquiring with patients. Cancer-related distress can be assessed using such items as the 8-item Intrusion subscale of the Impact of Events Scale [41]. The 13-item holding back measure used in this study could also be helpful for assessing holding back concerns among gynecologic cancer patients [15].

In summary, growth mixture modeling identified classes of women with distinct trajectories of longitudinal depression, HRQOL, and physical functioning. We also found clinical and psychological risk factors that clinicians may screen for and intervene upon in order to try to improve outcomes for the subset of patients at greatest risk.

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Figure 1.
 Estimated means of (A) depression, (B) quality of life, and (C) physical disability scores for the overall sample and each patient class.

Table 1

Demographic and clinical factors as univariate predictors of class membership.

	Total Sample N=124	Depression		QOL		Physical Function		p
		Class 1 (n=15)	Class 2 (n=109)	p	Class 1 (n=11)	Class 2 (n=93)	p	
Age (X±SD)	56±10	57±10	54±8	.37	56±10	51±8	.11	.59
Race								
White/Caucasian	96 (77%)	10 (67%)	86 (79%)	.33	7 (64%)	18 (19%)	.24	.74
Other	28 (23%)	5 (33%)	23 (21%)		4 (36%)	75 (81%)		
Education								
High school degree	22 (18%)	17 (16%)	5 (33%)	.14	2 (18%)	12 (13%)	.64	.73
Some college	102 (82%)	92 (84%)	10 (67%)		9 (82%)	81 (87%)		
Marital Status								
Not married	34 (27%)	28 (26%)	6 (40%)	.35	5 (45%)	18 (19%)	.06	.03
Married	90 (73%)	81 (74%)	9 (60%)		6 (55%)	75 (81%)		
Household income								
\$49,999 per year	47 (38%)	39 (36%)	8 (53%)	.26	6 (55%)	31 (33%)	.19	.26
\$50,000 per year	77 (62%)	70 (64%)	7 (47%)		5 (45%)	62 (67%)		
Gynecologic Cancer Diagnosis				.33			.39	.12
Ovarian	75 (60%)	11 (73%)	64 (59%)		9 (82%)	53 (57%)		
Fallopian	17 (14%)	2 (13%)	15 (14%)		1 (9%)	13 (14%)		
Endometrial	15 (12%)	0 (0%)	15 (14%)		0 (0%)	14 (15%)		
Uterine	8 (7%)	0 (0%)	8 (7%)		0 (0%)	6 (7%)		
Cervical	6 (5%)	1 (7%)	5 (4%)		0 (0%)	5 (5%)		
Other	3 (2%)	1 (7%)	2 (2%)		1 (9%)	2 (2%)		
Months since diagnosis (X±SD)	3.8±1.7	3.8±1.7	4.2±2.0	.40	3.7±1.6	3.2±1.7	.32	.74
Menopausal status								
Premenopausal	11 (9%)	1 (7%)	10 (9%)		2 (18%)	9 (10%)		
Postmenopausal								

	Total Sample N=124	Depression		QOL		Physical Function		p
		Class 1 (n=15)	Class 2 (n=109)	p	Class 1 (n=11)	Class 2 (n=93)	p	
Perimenopausal	7 (6%)	1 (7%)	6 (5%)	.94	0 (0%)	5 (5%)	.51	.51
Postmenopausal	100 (80%)	12 (79%)	88 (81%)		8 (73%)	75 (81%)		
Missing	6 (5%)	1 (7%)	5 (5%)		1 (9%)	4 (4%)		
Chemotherapy at baseline								
No	13 (11%)	2 (13%)	11 (10%)		1 (9%)	7 (8%)		
Yes	107 (86%)	13 (87%)	94 (86%)	.67	10 (91%)	82 (88%)	0.99	.21
Missing	4 (3%)	—	4 (4%)		—	4 (4%)		
Radiation at baseline								
No	113 (91%)	15 (100%)	98 (90%)		11 (100%)	83 (89%)		
Yes	9 (7%)	0 (0%)	9 (8%)	.60	0 (0%)	8 (9%)	0.59	.99
Missing	2 (2%)	—	2 (2%)		—	2 (2%)		
Surgery								
TAHBSO	93 (75%)	10 (67%)	83 (76%)		8 (73%)	69 (74%)		
Other/None	19 (15%)	3 (20%)	16 (15%)	.46	2 (18%)	16 (17%)	>.99	.43
Missing	12 (10%)	2 (13%)	10 (9%)		1 (9%)	8 (9%)		
Distant metastasis present								
No	112 (90%)	14 (93%)	98 (90%)	>.99	10 (91%)	84 (90%)	>.99	>.99
Yes	12 (10%)	1 (7%)	11 (10%)		1 (9%)	9 (10%)		
Taking pain medication								
No	90 (72%)	6 (40%)	84 (77%)		4 (36%)	70 (75%)		
Yes	32 (26%)	9 (60%)	23 (21%)	<.01	7 (64%)	21 (23%)	.01	<.01
Missing	2 (2%)	—	2 (2%)		—	—		
Taking depression medication								
No	94 (75%)	12 (80%)	82 (75%)		9 (82%)	70 (75%)		
Yes	27 (22%)	3 (20%)	24 (22%)	>.99	2 (18%)	21 (23%)	>.99	>.99
Missing	3 (2%)	—	3 (3%)		—	—		

	Total Sample N=124	Depression		QOL		Physical Function	
		Class 1 (n=15)	Class 2 (n=109)	Class 1 (n=11)	Class 2 (n=93)	Class 1 (n=15)	Class 2 (n=109)
			<i>p</i>		<i>p</i>		<i>p</i>
Taking anxiety medication							
No	74 (60%)	9 (60%)	65 (60%)	4 (36%)	58 (62%)	9 (60%)	65 (60%)
Yes	47 (38%)	6 (40%)	41 (38%)	7 (64%)	32 (35%)	6 (40%)	41 (37%)
Missing	3 (2%)	—	3 (3%)	—	3 (3%)	—	3 (3%)
>.99							
Taking sleep medication							
No	100 (81%)	13 (87%)	87 (80%)	74 (80%)	10 (91%)	87 (80%)	13 (87%)
Yes	21 (17%)	2 (13%)	19 (17%)	16 (17%)	1 (9%)	19 (17%)	2 (13%)
Missing	3 (2%)	—	3 (3%)	3 (3%)	—	3 (3%)	—
>.99							

Table 2

Summary of statistical fit indices.

	Number of Classes	AIC	BIC	-2LL	Free parameters	Entropy	LMR p
Depression	1	3858.71	3889.74	1918.34	11	—	—
	2	3829.77	3869.25	1900.89	14	.90	<.01
	3	3816.75	3864.69	1891.37	17	.85	.46
Quality of Life	1	3422.00	3451.09	1700.00	11	—	—
	2	3414.23	3451.26	1693.12	14	.85	.05
	3	3413.00	3457.96	1689.50	17	.77	.37
Physical Disability	1	4964.10	4995.13	2471.05	11	—	—
	2	4928.59	4968.08	2450.30	14	.90	<.01
	3	4903.03	4950.97	2434.51	17	.85	.02

Table 3

Parameter estimates for growth mixture models.

Class	% of Sample	Fixed Effects			
		Intercept (SE)	95% CI	Slope (SE)	95% CI
Depression	1	9.79 (0.58)***	8.66 to 10.93	-0.05 (0.01)***	-0.07 to -0.04
	2	23.22 (1.27)***	20.73 to 25.72	0.01 (0.03)	-0.04 to 0.07
Quality of Life	1	74.54 (1.72)***	71.18 to 77.91	0.14 (0.03)***	0.10 to 0.19
	2	48.04 (3.03)***	42.10 to 53.98	-0.12 (0.06)	-0.23 to 0.02
Physical Disability	1	23.17 (15.93)***	20.32 to 26.02	-0.17 (0.03)***	-0.23 to -0.11
	2	54.61 (3.88)***	47.01 to 62.22	0.03 (0.06)	-0.10 to 0.15

Table 4

Psychosocial factors as univariate predictors of class membership.

Predictor	Total Sample N=124	Depression		QOL		Physical Function	
		Class 1 (n=109)	Class 2 (n=15)	Class 1 (n=93)	Class 2 (n=11)	Class 1 (n=109)	Class 2 (n=15)
							p
Religious/pastoral counseling							
None in past month	110 (89%)	95 (87%)	15 (100%)	83 (89%)	11 (100%)	95 (87%)	15 (100%)
Used in past month	13 (10%)	13 (12%)	0 (0%)	9 (10%)	0 (0%)	13 (12%)	0 (0%)
Missing	1 (1%)	1 (1%)	—	1 (1%)	—	1 (1%)	—
							.36
Other psychosocial services							
None in past month	92 (74%)	83 (76%)	9 (60%)	72 (77%)	7 (64%)	84 (77%)	8 (53%)
Used in past month	32 (26%)	26 (24%)	6 (40%)	21 (23%)	4 (36%)	25 (23%)	7 (47%)
							.06
Psychotropic medications							
None in the past month	53 (43%)	48 (44%)	5 (33%)	37 (40%)	5 (45%)	49 (45%)	4 (27%)
Used in the past month	70 (56%)	60 (55%)	10 (66%)	55 (59%)	6 (55%)	59 (54%)	11 (73%)
Missing	1 (1%)	1 (1%)	—	1 (1%)	—	1 (1%)	—
							.27
Holding Back	2.1 (1.3)	2.0 (1.2)	3.2 (1.2)	2.0 (1.2)	3.6 (1.0)	2.0 (1.3)	3.3 (0.9)
							<.01
Unsupportive Behavior From Family and Friends	16.3 (5.0)	15.7 (4.2)	21.2 (7.6)	15.9 (4.6)	22.5 (6.3)	15.9 (4.8)	19.4 (5.5)
							<.01
							.02
Benefit Finding	3.4 (0.9)	3.4 (0.9)	3.3 (1.0)	3.4 (0.8)	2.8 (0.7)	3.4 (0.9)	3.2 (0.9)
							0.03
							.29
Coping Efficacy	53.2 (13.9)	54.3 (13.9)	45.6 (11.5)	53.7 (13.7)	42.2 (8.5)	54.0 (14.0)	47.9 (11.9)
							0.01
							.12
Intrusive Thoughts	12.7 (8.9)	11.2 (8.1)	23.7 (7.3)	12.6 (13.7)	20.5 (7.5)	11.7 (8.5)	20.5 (8.1)
							0.01
							<.01
Avoidance	16.4 (9.5)	15.4 (9.2)	23.4 (8.7)	16.2 (9.4)	22.3 (8.5)	15.6 (9.5)	22.1 (7.3)
							0.05
							0.02
COPE: Positive Reinterpretation	11.2 (3.8)	11.3 (3.9)	10.7 (3.4)	11.3 (3.9)	10.1 (3.0)	11.3 (3.9)	10.5 (3.1)
							0.33
							.47
COPE: Planning	11.2 (3.8)	11.2 (3.8)	11.0 (4.2)	11.4 (3.7)	9.9 (3.6)	11.3 (3.9)	10.5 (3.3)
							0.21
							.45