The association of self-leadership, health behaviors, and posttraumatic growth with health-related quality of life in patients with cancer

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Abstract

Purpose: We tried to evaluate the association of self-leadership, effective health behaviors, and posttraumatic growth with health-related quality of life (HRQOL).

Methods: We recruited survivors of cancer from seven hospitals in Korea between 2011 and 2012. The patients completed the Seven Habits Profile (7HP) to evaluate leadership competency, the 10 rules for highly effective health behavior to evaluate health behavior, the Posttraumatic Growth Inventory (PTGI) to evaluate posttraumatic growth, the Short Form 36 (SF-36) to evaluate HRQOL, and the Hospital Anxiety and Depression Scale (HADS) to evaluate anxiety and depression. We performed multiple logistic regressions to identify significant associations.

Results: A total of 668 patients with cancer participated in the study. Patients who scored high on the leadership subscales of Be Proactive, Begin with the End in Mind, Put First Things First, Think Win-Win, Synergize, and Sharpen the Saw in 7HP tried to practice and keep their health behaviors more. The Begin with the End in Mind, Put First Things First, Synergize, and Sharpen the Saw subscales of the 7HP were also significantly correlated with subscales on the PTGI. Patients who scored high on the leadership subscales of Life Balance, Be Proactive, Begin with the End in Mind, Think Win-Win, and Sharpen the Saw had higher physical and mental component scale scores on the SF-36 and lower anxiety and depression subscale scores on the HADS.

Conclusion: Self-leadership, health behaviors, and posttraumatic growth are associated with QOL in survivors of cancer. Copyright © 2014 John Wiley & Sons, Ltd.

Introduction

The number of survivors of cancer has increased over the last two decades because of improvements in the early detection and treatment of cancer [1,2]. With long-term surveillance and planned care, cancer can often be managed as a chronic illness. Because of increased survivorship, the Institute of Medicine has stressed the need for new models of the cancer care continuum, such as the Chronic Care Model (CCM) [3]. Self-management (SM) helps patients actively participate in their own cancer care, obtain the information needed to set priorities, and manage their cancer plan [3]. Like proactive leadership in organization and manpower management, the self-leadership component of SM could empower patients to

become more able to take care of themselves. Self-leadership enables oncology care providers to form collaborative partnerships with patients and families as well as with other physicians. Several randomized clinical trials (RCTs) have been conducted to study the effectiveness of behavioral interventions on the health outcomes of survivors of cancer [4–7].

In this paper, we aimed to evaluate the impact of self-leadership competency as measured by the Seven Habits Profile (7HP), which is based on 'The Seven Habits of Highly Effective People' [8] by Stephen R. Covey, on effective SM within the CCM. In practice, Dr. Covey applied his model to diabetes management [9], and we also applied self-leadership competency assessment to patients with cancer. Because the number of survivors of

cancer is increasing rapidly in Korea, we have to develop new care models that enable survivors to overcome their cancer and to proactively self-manage a high quality of life. The SM program with 'The Seven Habits of Highly Effective People with Cancer' may empower patients with cancer to proactively manage their own health care and accomplish their goals. Just as the seven habits include habits for partnership with others such as Think Win-Win, Seek First to Understand, and Synergize, it may enable oncology providers to form collaborative partnerships with patients and families as well as with other physicians, as in the CCM model.

In the process of proactively overcoming cancer, patients can experience positive growth [10]. Posttraumatic growth (PTG) occurs when people reap benefits from a life risk, such as a diagnosis of cancer. Studies of the relationship between PTG and quality of life (QOL) are many but inconclusive; results have been reported as positive, negative, and null [11]. We included PTG, as a QOL correlates as a way to examine related PTG subscales that are associated with a QOL of patient with cancer.

In order to develop a new care model (Figure 1), we first hypothesized, based on previous studies, that self-leadership can have a positive influence on the regular practice of health behaviors and on PTG. Next, we examined the correlation of self-leadership, health behaviors, and PTG with health-related QOL (HRQOL) and mental health (anxiety and depression) in patients with cancer.

Patients and methods

Participants

For this cross-sectional study, 709 patients with cancer participated from seven hospitals in Korea. The study protocol was approved by the Institutional Review Board and passed the Ethical Committee Review of each hospital. Subjects were excluded from the study if they (a) were unable to read or understand Korean or communicate with others, (b) were psychologically unstable (e.g., had severe depression, symptoms of dyspnea, etc.), or (c) refused to
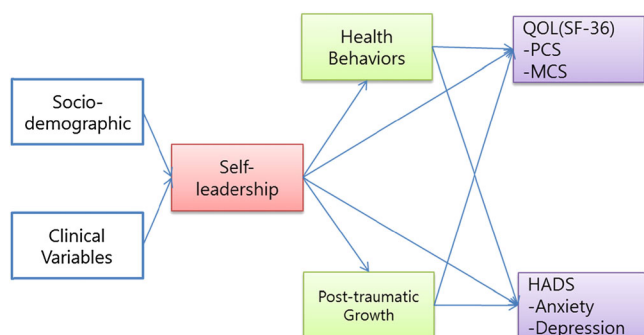
participate in the study. From the recruited participants, 668 were eligible for the study and completed the protocol.

Measures

Data collection

Investigators screened inpatients and outpatients from the cancer registries of seven Korean hospitals as potential participants. A checklist of inclusion and exclusion criteria was used to identify eligible patients with cancer. Survivors of cancer were recruited for the study if they (a) were over 18 years of age, (b) understood the intention of the study, and (c) agreed to participate. Survivors were excluded from the study if they (a) were unable to read or understand Korean or communicate with others, (b) were psychologically unstable (e.g., had severe depression or symptoms of dyspnea), or (c) refused to participate. Of the 813 survivors recruited, 104 (12.8%) refused to participate and 41 (5%) did not complete questionnaire. The remaining 668 (82.2%) were eligible for the study and completed the protocol.

Leadership competency

The 7HP [8,12] was used to measure leadership competency in each patient. Among nine subscales, the first two components of the 7HP consist of fundamental habits that evaluate the Emotional Bank Account (the amount of trust that has been built up in a relationship) and Life Balance. The remaining sections of the 7HP probe the Seven Habits: Be Proactive (take responsibility for your own behavior), Begin with the End in Mind (have a clear vision of what to achieve and accomplish), Put First Things First (focus heavily on highly important but not necessarily urgent activities), Think Win-Win (look for synergistic solutions to problems), Seek First to Understand (listen with the intent to fully understand the other person, both emotionally and intellectually), Synergize (believe the whole is greater than the sum of its parts), and Sharpen the Saw (seek continuous improvement). Each question was scored on a 6-point Likert scale from 1 to 6, with the sum of the three questions covering one domain. Thus, the total score possible for each domain was 18. The higher the scores, the more closely the patient conformed to the Seven Habits Principles. Following the standardized scoring manual [8,12], we assessed and dichotomized leadership competency from the 7HP into poor leadership ability (7HP < 10) and good leadership ability (7HP ≥ 10). To assess the internal consistency of the 7HP among the participants in this study, we used Cronbach's α, which was 0.935 for all variables.

Posttraumatic positive growth

The PTG Inventory (PTGI) was used to assess each patient's positive growth resulting from the cancer diagnosis

Figure 1. Conceptual framework of this study

[13]. The PTGI includes 21 questions that ask patients to indicate the degree to which they experienced each item in relation to overcoming cancer. To figure out the relationship between specific domains of PTG and other factors, we used subscale scores instead of total scores. Subscales of the PTGI describe positive life changes in five domains: relating to others (7 items, 35 points), personal strength (5 items, 25 points), new possibilities (4 items, 20 points), appreciation of life (2 items, 10 points), and spiritual change (3 items, 15 points). Each item was scored on a 6-point Likert scale from 0 to 5. Total scores of the five subscales were summed for each item. A higher score on the PTGI indicates greater posttraumatic positive growth [13]. Cronbach's α, which was used to assess the internal consistency of the PTGI in this study, was 0.954 for all variables.

Health-related quality of life

Health-related quality of life was measured using the Korean version of the Short Form 36 (SF-36) questionnaire, which was validated by the original author [14]. The SF-36 is a self-administered questionnaire that measures eight subscales of HRQOL [15]. In our study, the SF-36 was measured by two dimensions: the physical component scale (PCS) and the mental component scale (MCS) [16]. Each domain was categorized on a scale of 0 to 100 with higher scores indicating better HRQOL. The internal consistency of the HRQOL was assessed among the participants in this study with Cronbach's α, which was 0.848 for all variables.

Hospital Anxiety and Depression Scale

The Hospital Anxiety and Depression Scale (HADS) is a self-reported measurement tool with two domains: the anxiety subscale and the depression subscale [17]. Total scores ranged from 0 to 21 for each subscale [18,19]. The HADS score was dichotomized with a cutoff of 8 for each sub-scale. The internal consistency of the HADS was assessed among the participants in this study with Cronbach's α, which was 0.87 for all variables.

Health behavior factors

Self-reported health behaviors were surveyed to investigate each patient's association with leadership competency on the 7HP, PTG on the PTGI, and HRQOL from the SF-36. These self-reported health behavior indicators were derived from the '10 Rules for Highly Effective Health Behavior' by our research team and developed as a questionnaire. During 2004 and 2005, questionnaires were mailed to approximately 220 patients who had completed treatments for stomach, breast, or cervical cancer. In them, patients were asked to rate their behaviors on 10 critical factors that improve QOL: (a) Positive Thinking, (b) Regular Exercise, (c) Balanced Diet, (d) Proactive Living, (e) Regular Check-Ups, (f) Helping Others, (g) Regular Religious Life, (h) Smoking and Drinking Cessation, (i) Work–Life Balance,

and (j) Living with Loved Ones. Health behavior stages (precontemplation, contemplation, preparation, action, and maintenance stages) were based on the transtheoretical model and categorized on a continuum consisting of the readiness and practicable activity of the 10 health behaviors. Stages were converted into scales ranging from 1 (precontemplation) to 5 (maintenance stage) for each behavior item [20]. For statistical analysis, we dichotomized each health behavior into two groups with a focus on maintenance of behavior change. Cronbach's α, which was used to assess the internal consistency of the health behavior indicators in this study, was 0.817 for all variables.

Statistical analysis

Descriptive statistics were computed for both demographic (age, sex, education, income, religion, and residence) and clinical (cancer type and cancer treatment stages) characteristics. First, a univariate analysis was conducted to measure leadership competency as a relative predictor for highly effective health behaviors. The adjusted odds ratio was computed from a multiple logistic regression and used to estimate the association between relative leadership competency (as measured by the 7HP) and health behavior status. Next, univariate analyses and multiple logistic regression models were constructed to determine meaningful associations between leadership competency and positive growth on the PTGI. Significant factors were added to the model to assess the effect of 7HP variables on positive growth. For the final model, all independent variables, including

Table 1. Demographic and clinical characteristics of the participants

		Respondents (N = 668)	
		No.	%
Sex	Male	124	18.56
	Female	540	80.84
Age (years)	18–49	293	43.86
	50–59	254	38.02
	≥60	113	16.92
Marital status	Married	548	82.04
	Not married	110	16.47
Education	High school graduate or below	388	58.08
	University graduate	270	40.42
Monthly income ($US)	<3000	297	44.47
	3000–4000	129	19.31
	>4000	214	32.04
Residence	Metropolitan area	417	62.43
	Rural area	244	36.53
Religion	Religious	465	48.95
	Nonreligious	194	29.04
Cancer type	Breast cancer	434	64.97
	Gastric/Colorectal/ Uterine cancer	125	18.72
	Other	108	16.17
Treatment status	In treatment	348	52.1
	Treatment complete	314	47.01

Table 2. The association of leadership factors with maintaining 10 effective health behaviors for more than 6 months based on a backward-selected multiple logistic regression model[a,b,c]

Predictors	n (%)	Positive Thinking aOR (CI)	Regular Exercise aOR (CI)	Balanced Diet aOR (CI)	Proactive Living aOR (CI)	Regular Check-Ups aOR (CI)	Helping Others aOR (CI)	Regular Religious Life aOR (CI)	Smoking and Drinking Cessation aOR (CI)	Work–Life Balance aOR (CI)	Living with Loved Ones aOR (CI)
Leadership competency (7HP)											
Be Proactive											
<10	103 (15.4)		1	1		1		-	-		
≥10	556 (83.2)	NS	2.54 (1.14–2.47)	2.88 (1.53–5.45)	NS	2.06 (1.17–3.62)	NS	-	-	NS	NS
Begin with the End in Mind											
<10	213 (31.9)				1			-			
≥10	448 (67.1)	NS	NS	NS	1.68 (1.05–2.68)	NS	NS	-	NS	NS	NS
Put First Things First											
<10	226 (33.8)	1			1		1				
≥10	434 (65.0)	1.79 (1.20–2.68)	NS	NS	2.07 (1.27–3.36)	NS	3.66 (2.00–6.08)	NS	NS	NS	NS
Think Win-Win											
<10	75 (11.2)	1	-					1	-		
≥10	584 (87.4)	2.11 (1.47–3.03)		NS	NS	NS	NS	2.14 (1.06–4.30)		NS	NS
Synergize											
<10	141 (21.1)	1					1			-	
≥10	518 (77.5)	NS	NS	NS	NS	NS	2.40 (1.16–4.96)	NS	NS	-	NS
Sharpen the Saw											
<10	147 (22.0)	1	1	1	1	1			1	1	1
≥10	510 (76.3)	NS	2.21 (1.31–3.7)	1.96 (1.19–3.22)	1.70 (1.0–2.82)	2.05 (1.28–3.27)	NS	NS	1.91 (1.22–2.99)	1.85 (1.19–2.87)	2.05 (1.32–3.16)

Abbreviations: LD, leadership; aOR, adjusted odds ratio; CI, confidence interval; NS, not significant.
[a]Multiple logistic regression models were run for each of the 10 effective health behaviors via dichotomous outcome variables: precontemplation, contemplation, preparation, and action versus maintenance. These models included variables that were identified as statistically significant independent predictors in each univariate analysis of LD correlates (adjusted for age: <50 vs ≥50; educational status: high school graduate or below vs university graduate; monthly income: <$3000 vs ≥$3000; religion: religious vs nonreligious; sex: male vs female; cancer treatment: in treatment vs ≥ treatment complete; and cancer type: breast cancer vs other cancers).
[b]LD variables that were not significantly correlated with each health behavior in the univariate cross tabulations (data not shown) are presented as '-'; these variables were not included in the model.
[c]The backward-selected multiple logistic regression analysis was conducted with sl entry = 0.05 and sl stay = 0.10.

leadership competency factors from the 7HP, positive growth from the PTGI, and health behavior from the 10 Rules for Highly Effective Health Behavior, were analyzed to determine significant factors associated with the HRQOL and HADS. At this process, a logistic regression model was constructed to determine relative predictors of HRQOL and HADS. All multiple regression models were constructed using a backward feature selection method to identify significant independent factors, which were also adjusted for clinical and demographic variables. Factors with a significance level greater than 0.05 were eliminated. All analyses were conducted using SAS 9.3 software (SAS Institute, Cary, NC). All adjusted odds ratios are expressed with 95% confidence intervals.

Results

Characteristics of participants

The demographic and clinical characteristics of the participants are reported in Table 1. The mean age of the participants was 50.44 ± 10.24 years old, and the majority (80.84%) were women. The per cent of participants who were still receiving treatment (52.1%) was slightly higher than the per cent who had completed treatment (47.01%).

Leadership skills associated with health behaviors

Multivariate analysis after adjustment for demographic and clinical characteristics showed that the patients with cancer with higher leadership scores (7HP > 10) maintained health behaviors for more than 6 months (Table 2). Patients who scored high on Be Proactive maintained Regular Exercise, Balanced Diet, and Regular Check-Ups; those who scored high on Put First Things First maintained Positive Thinking, Proactive Living, and Helping Others; and those with higher

scores on Sharpen the Saw maintained Regular Exercise, Balanced Diet, Proactive Living, Regular Check-Ups, Smoking and Drinking Cessation, Work–Life Balance, and Living with Loved Ones. Patients who scored high on Begin with the End in Mind maintained Proactive Living, those who scored higher on Synergize maintained Helping Others, and those who had higher scores on Think Win-Win maintained Positive Thinking and Regular Religious Life.

Leadership skills associated with posttraumatic growth

Patients who possessed good leadership skills reported higher PTG following their cancer diagnosis (Table 3). Patients who scored high on Begin with the End in Mind reported greater improvements on PTG of Relating to Others, Personal Strength, New Possibilities, and Appreciation of Life. Patients who scored high on Put First Things First reported more Spiritual Change. Patients who scored high on Put First Things First and Synergize reported greater improvement in Relating to Others, Personal Strength, and New Possibilities. Patients with higher scores on Sharpen the Saw reported a greater Appreciation of Life.

Leadership skills, health behaviors, and posttraumatic growth factors associated with PCS, MCS, and HADS scores

Patients with high scores for leadership, PTG, and healthy behaviors showed greater HRQOL and less anxiety and depression (Table 4). Specifically, patients with higher Life Balance of the 7HP reported better physical HRQOL, and those who scored high on Be Proactive and Sharpen the Saw reported better mental HRQOL. Patients with a higher Think Win-Win score reported less anxiety and

Table 3. Leadership factors that are related to PTGI subscales based on a backward-selected multiple logistic regression model[a,b]

Predictors	n (%)	Relating to Others (ref; ≤23) aOR (CI)	Personal Strength (ref; ≤18) aOR (CI)	New Possibilities (ref; ≤15) aOR (CI)	Appreciation of Life (ref; ≤11) aOR (CI)	Spiritual Change (ref; ≤5) aOR (CI)
Leadership competency (7HP)						
Begin with the End in Mind						
<10	213 (31.9)	I	I	I	I	
≥10	448 (67.1)	1.70 (1.07–2.71)	3.47 (1.78–6.75)	2.00 (1.18–3.39)	2.29 (1.52–3.45)	NS
Put First Things First						
<10	226 (33.8)	I	I	I		I
≥10	434 (65.0)	1.96 (1.23–3.14)	2.29(1.22–4.29)	1.97(1.16–3.34)	NS	1.59 (1.08–2.24)
Synergize						
<10	141 (21.1)	I	I	I		
≥10	518 (77.5)	1.86 (1.12–3.40)	2.46 (1.14–5.28)	2.29 (1.23–4.28)	NS	NS
Sharpen the Saw						
<10	147 (22.0)				I	
≥10	510 (76.3)	NS	NS	NS	1.76 (1.1.69–2.80)	NS

[a]Ten multiple logistic regression models were run for each PTGI subscale. These models included variables that were identified as statistically significant independent predictors in each univariate analysis of LD correlates (adjusted variables are the same with those of Table 2).
[b]The backward-selected multiple logistic regression analysis was conducted with sl entry = 0.05 and sl stay = 0.10.

Table 4. Leadership, health behavior, and PTGI factors that are related to overall PCS, MCS, and HADS scores based on a backward-selected multiple logistic regression model[a,b]

| | | Predictive models for high HRQOL | | | | Predictive models for low HADS scores | | | |
| | | PCS > med (ref ≤ med) (N = 327) | | MCS > med (ref ≤ med) (N = 332) | | Anxiety ≥ 8 (ref; <8) (N = 468) | | Depression ≥ 8 (ref; <8) (N = 468) | |
Variables	n (%)	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Leadership									
Life Balance									
<10	83 (12.7)	l							
≥10	573 (85.8)	1.99	1.08–3.69		NS		NS		NS
Be Proactive									
<10	103 (15.4)			l					
≥10	556 (83.2)		NS	2.29	1.22–4.30		NS		NS
Begin with the End in Mind									
<10	213 (31.9)					l			
≥10	448 (67.1)		NS		NS	0.46	0.27–0.78		NS
Think Win-Win									
<10	75 (11.2)					l		l	
≥10	584 (87.4)		NS		NS	0.37	0.19–0.73	0.47	0.25–0.88
Sharpen the Saw									
< 10	147 (22.0)			l					
≥ 10	510 (76.3)		NS	1.6	0.94–2.73		NS		NS
Health behaviors									
Positive thinking									
≤Activation	250 (37.4)	l		l		l		l	
Maintenance	406 (60.8)	1.77	1.11–2.81	2.05	1.29–3.28	0.46	0.27–0.79	0.55	0.35–0.88
Balanced Diet									
≤Activation	417 (62.4)	l							
Maintenance	240 (35.9)	1.62	1.02–2.56		NS		NS		NS
Regular Exercise									
≤Activation	387 (57.9)			l					
Maintenance	270 (40.4)		NS	1.64	1.03–2.61		NS		NS
Proactive Living									
≤Activation	314(47.0)					l			
Maintenance	338(50.6)		-		NS	0.5	0.28–0.87		NS
Smoking and Drinking Cessation									
≤Activation	178 (26.6)							l	
Maintenance	441 (66.0)		NS		NS		NS	0.58	0.35–0.96
PTGI									
Personal Strength									
≤18	476 (71.3)	l		l					
>18	169 (25.3)	1.74	1.07–2.83	1.91	1.16–3.13		-		NS
Appreciation of Life									
≤11	338 (50.6)							l	
>11	317 (47.5)		NS		NS		NS	0.58	0.37–0.90

Abbreviations: PCS, physical component scale; MCS, mental component scale.

[a]The backward-selected multiple logistic regression model included variables that were identified as statistically significant independent predictors in each univariate analysis of LD correlates with sl entry = 0.05 and sl stay = 0.10 (adjusted variables are the same with those of Table 2).

[b]Variables that were not significantly correlated with each health behavior in the univariate cross tabulations (data not shown) are presented as '-'; these variables were not included in the model.

less depression, while those with high Begin with the End in Mind scores also reported less anxiety. Patients who maintained Positive Thinking reported better physical and mental HRQOL and less anxiety and depression. Patients who maintained a Balanced Diet reported better physical HRQOL, and those who practiced Regular Exercise routinely reported better mental HRQOL. Patients who maintained Proactive Living reported less anxiety, and those who stopped Smoking and Drinking reported less depression. In addition, patients who showed improvements in Personal Strength reported better physical and mental HRQOL, and those who reported a greater Appreciation of Life were less depressed.

Discussion

Our findings demonstrate that self-leadership could be associated as a critical factor with health behavior, PTG, and HRQOL among patients with cancer. Previous studies have suggested that differences in health behaviors, such

as diet and physical activity, may influence HRQOL among patients with cancer. The current study suggests that self-leadership may enable patients with cancer to proactively focus on overcoming cancer and, thereby, promote their health, PTG, and HRQOL.

We reviewed 'The Seven Habits of Highly Effective People' by Stephen R. Covey [8] and modified these habits into 'The Seven Habits of Highly Effective People with Cancer' [16]. Patients with cancer equipped with 'The Seven Habits of Highly Effective People with Cancer' may be able to proactively manage their own health and accomplish their goals. The results of the current study suggest that self-leadership could be an important core element of SM for both patients and their families. This self-leadership is similar to self-efficacy based on the Social Learning Theory of Bandura, which can help patients with cancer solve problems and deal with difficult emotions. We believe that building and increasing patients' self-leadership empower them and enable them to improve their health and QOL proactively. Some RCTs show that self-efficacy could improve health behavior in survivors of cancer [21,22]. In the final model of leadership, health behaviors, and PTGI factors that are related to HRQOL (Table 4), Be Proactive and Sharpen the Saw in self-leadership, only affected mental QOL. Proactivity and continuous refreshment of one's physical, mental, social, and spiritual life may be related to self-control [23]. When people feel that they can control their lives, psychological well-being, like self-confidence, increases [24]. That might explain why mental QOL was higher among those with the high self-leadership skills of being proactive and sharpening the saw [3]. Those components of the 7HP, however, may not have the power to enable patients with cancer to improve their physical QOL, anxiety, and depression.

We performed subgroup analysis in accordance with the patients' treatment stage to learn if there were differences between those still on treatment and those who completed treatment. Subgroup analysis did not find new correlates, however, and some correlates disappeared. Thus, further study is needed to clarify the issue.

There are some limitations to consider in the interpretation of the study results. One limitation of this study is selection bias. Our sample may not be representative of the general population of survivors of cancer, which restricts the generalizability of these findings to similar groups of survivors of cancer. Second, in this cross-sectional study, we were not able to determine causality or how self-leadership influenced the HRQOL in survivors of cancer. Further cohort studies or RCTs are needed for this. Third, excluding the patients with cancer with severe depression might have skewed the outcome variables of HRQOL, anxiety, and depression. Finally, we did not confirm the validity and reliability of the '10 Rules for Highly Effective Health Behavior', which successful survivors of cancer had selected as critical to improving their QOL.

Despite the limitations, our data conclusively suggest that self-leadership may empower patients with cancer to take care of themselves to keep healthy habits and positively grow by themselves. These self-leadership, healthy behaviors, and PTG factors are associated with HRQOL in survivors of cancer. As suggested by these findings, we will develop a novel health management program based on self-leadership that may empower patients to proactively improve their health.

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Conflict of interest

None disclosed.

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