

The relationship between baseline self-esteem and health-related quality of life outcomes in oncology patients

Abstract

Aims: Self-esteem plays an important role in the therapeutic process of oncology patients, as it influences how individuals cope with the diagnosis and respond during treatment. Changes in health-related quality of life (HRQoL) are common in the oncology population, with self-esteem representing an important psychological factor associated with these outcomes. The aim of this study was to examine baseline self-esteem and quality of life, as well as their association before and after treatment, in oncology patients.

Methods: This study included 53 oncology patients undergoing radiotherapy between February and July 2024. A prospective pre-post observational design was employed, utilizing the Rosenberg Self-Esteem Scale and the Functional Assessment of Cancer Therapy-General (FACT-G) questionnaire to assess self-esteem, health-related quality of life, and their interrelationship in oncology patients.

Findings: The Rosenberg Self-Esteem Scale demonstrated good internal consistency in the study population. Baseline self-esteem was higher in women than in men; however, this difference was not reflected in post-treatment quality of life. Following therapy, lower HRQoL scores were observed in physical, emotional, and functional domains, as well as in the FACT-G total score, while social/family well-being remained largely unchanged. Higher baseline self-esteem was associated with better HRQoL both before and after treatment. Age and sex were not significantly associated with post-treatment quality of life outcomes.

Conclusions: Cancer treatment was associated with declines in physical, emotional, and functional quality of life, while social and family well-being remained stable. Higher baseline self-esteem was consistently associated with better overall quality of life before and after treatment.

Keywords: FACT-G; oncology patients; psycho-oncology; quality of life; self-esteem

Introduction

Contemporary psychology views self-confidence as a core concept, with increasing interest in its study in recent years. It encompasses an individual's attitudes and emotional responses toward themselves, including how they assess their abilities, traits, and competencies when encountering challenges^[1,2]. Additionally, self-confidence indicates a sense of satisfaction, subjective well-being, and personal worth^[3]. Typically, a distinction exists between global self-confidence — a relatively stable perception of one's overall worth — and specific self-evaluations related to particular skills or roles. The former is often measured by standardized tools like the Rosenberg Self-Esteem Scale^[4]. Self-confidence consistently correlates with broader life outcomes such as social interactions, emotional stability, and health behaviors, highlighting its importance beyond pure psychology^[1]. Due to its close connection to self-image, identity, and perceived self-worth, self-esteem is a central concept for understanding psychological adjustment and well-being, especially in contexts involving chronic illness and clinical populations^[5].

Oncology places a high value on self-esteem. Even if their reactions differ substantially, a cancer diagnosis not only impairs patients' physical health but also profoundly impacts their psychological well-being, putting their sense of self-worth and emotional stability to the test^[6]. This disruption typically follows certain, recognizable routes. Appearance changes brought on by therapy, including hair loss, scars, and weight fluctuations, might affect one's body image and sense of self. Loss of routine and independence, as well as shifts in social and work responsibilities, may further lower one's sense of competence and self-esteem^[7]. This shows that low self-esteem is a psychological

obstacle in cancer care that is common rather than specific to a diagnosis since these consequences are observed across a variety of cancer types and treatments.

This psychological strain is substantial. According to meta-analytic data from numerous interview-based studies conducted in oncological, hematological, and palliative-care settings, a significant percentage of cancer patients suffer clinically significant anxiety, depression, or adjustment disorders throughout their illness [8]. Furthermore, long-term cancer survivors have higher rates of depression and anxiety than their spouses and healthy controls, indicating that psychological anguish lasts long after the initial diagnosis and treatment phase^[9]. These findings show that a lot of cancer patients may have low self-esteem during treatment because self-esteem is closely connected to emotional adjustment. This highlights the value of methodically evaluating self-esteem in addition to common outcomes such as depression and anxiety.

Treatment compliance and overall outcomes are immediately impacted by these psychological consequences. Because of this, healthcare providers and family members must make it a primary responsibility to preserve patients' self-esteem, as their support, empathy, and patience have a major impact on patients' capacity to manage their diagnosis^[10,11]. In the meantime, family caregivers often experience a lot of stress throughout the illness, which might lower the caliber of their assistance ^[12]. Consequently, for this especially susceptible group of patients, ongoing attempts to promote self-esteem are essential^[13–15].

Reliable assessment of these constructs necessitates the use of standardized and well-validated instruments. The Rosenberg Self-Esteem Scale (RSES), a well-known instrument that is brief, simple to administer, and has strong psychometric qualities across many populations and cultural backgrounds, was used to evaluate self-esteem in this study^[4, 16]. In the meantime, health-related quality of life (HRQoL) provides a useful structure for comprehending the effects of cancer and its treatment on patients' physical, emotional, functional, and social health. The Functional Assessment of Cancer Therapy-General (FACT-G) is one of the most widely validated instruments. It was developed specifically for a variety of oncology populations and has been shown to retain validity and reliability even among older patients, a population that is frequently underrepresented in validation studies. To obtain a more thorough and clinically significant understanding of patients' treatment experiences, rather than treating physical and psychological outcomes separately, HRQoL and psychological constructs like self-esteem—using validated, oncology-specific instruments—should be evaluated in conjunction. This is because radiotherapy frequently causes both physical and psychological stress.

Even so, evidence directly connecting self-esteem to HRQoL in oncology patients remains scarce and largely restricted to diagnostic subgroups, most often breast cancer, relying mainly on cross-sectional designs^[3]. Patient-reported outcomes have more broadly been shown to hold independent prognostic value in oncology^[10], and psycho-oncological interventions aimed at emotional well-being have produced measurable improvements in HRQoL^[11], yet the precise contribution of baseline self-esteem, measured before treatment begins, to later changes in HRQoL over the course of therapy has not been sufficiently examined in mixed-diagnosis, heterogeneous oncology populations. It remains particularly unclear whether baseline self-esteem predicts HRQoL trajectories independently of factors such as age and sex, and whether this relationship holds consistently across the physical, emotional, functional, and social/family domains of HRQoL.

In light of the above, this study aimed to investigate the relationship between psychological factors and treatment outcomes by focusing on baseline self-esteem and its association with health-related quality of life, measured using the Functional Assessment of Cancer Therapy-General (FACT-G) questionnaire, among oncology patients treated at the Department of Oncology, Clinical Hospital Centre Osijek, Croatia.

Materials and Methods

This prospective pre–post observational study, with two assessments conducted before the start and after completion of radiotherapy and no interim measurements, was carried out at the Department of Oncology, Clinical Hospital Centre Osijek, Croatia, between February and July 2024. The research was approved by the Ethics Committee of the Clinical Hospital Centre Osijek (R1-492-2/2023) and the Ethics Committee of the Faculty of Dental Medicine and Health Osijek (CLASS: 602-01/24-12/02, No.: 2158/97-97-10-24-03). Fifty-three oncology patients aged 30 to 87 years, all users of the Department's services, participated in this study. Participation was voluntary, and all participants were informed about the study's objectives. They confirmed their voluntary participation by signing the informed consent form and completing the questionnaire. During and after this study,

participants were guaranteed complete anonymity, and the collected data could not, in any way, be linked to their identity. Each participant had the right to withdraw from this study at any time.

For this research, a questionnaire divided into three sections was used. The first section included demographic questions related to gender, age, and cancer type. Baseline demographic and clinical characteristics were collected solely to describe the study population and were not used for subgroup or comparative analyses due to the limited and heterogeneous sample size. The second section comprised the Rosenberg Self-Esteem Scale (RSES), which is publicly available for use^[16] and consists of ten statements—five positively worded and five negatively worded—assessed using a five-point Likert scale (0 = completely false to 4 = completely true). The total score ranges from 0 to 40 and was analyzed and presented as a continuous variable. The RSES was administered only once, at baseline, i.e., at the beginning of this study.

The third section included the Functional Assessment of Cancer Therapy-General (FACT-G) questionnaire, approved by the author David Cella (PhD, IL, USA)^[17,18], which contains 26 items aiming to assess quality of life in relation to treatment outcomes across four dimensions: physical, social/family, emotional, and functional well-being. Approval for the use of the questionnaire is provided in the Supplementary Materials. Responses are rated on a Likert scale from 0 to 4, with higher scores indicating better quality of life. The total possible score ranges from 0 to 104, with the physical and functional well-being subscales ranging from 0 to 28, and social and emotional well-being subscales ranging from 0 to 24. During the analysis of both questionnaires, negatively worded items were reverse-coded. The questionnaire refers to the seven days preceding the assessment and, in this study, was administered twice, at the beginning and after completion of therapy, to enable comparison of results. Questionnaires were self-administered in a quiet setting. Only patients with adequate functional and cognitive status were included. A member of the research team was present and could read items aloud or assist with marking answers upon request, without influencing patients' responses.

To detect a medium effect size ($d_z = 0.5$) of the difference in continuous variables between two measurements, with a significance level of 0.05 and a statistical power of 0.90, the minimum required sample size is 44 participants (G*Power, version 3.1.9.7)^[19].

Statistical Method

Categorical variables were described using absolute and relative frequencies. Normality of data distribution was assessed using the Shapiro-Wilk test. Continuous variables with a normal distribution were presented as the mean and standard deviation, whereas non-normally distributed variables were described using the median and interquartile range. Differences between two independent groups were analyzed using the independent samples t-test, with mean differences and corresponding 95% confidence intervals reported. Differences between baseline and post-treatment continuous variables were assessed using the Wilcoxon signed-rank test, with Hodges-Lehmann estimates of the median difference and associated 95% confidence intervals provided. Associations between variables were evaluated using Spearman's rank correlation coefficient. Linear regression analysis was performed to examine the association between baseline self-esteem, assessed using the Rosenberg Self-Esteem Scale (RSES), and post-treatment health-related quality of life, measured by the FACT-G total score. Regression coefficients (β), 95% confidence intervals, and p-values were reported. All p-values were two-sided, and statistical significance was set at $\alpha = 0.05$. Statistical analyses were conducted using MedCalc® Statistical Software version 23.3.7 (MedCalc Software Ltd., Ostend, Belgium; 2025).

Findings

General characteristics of participants

This study included 53 oncology patients treated at the Department of Oncology, Clinical Hospital Center Osijek, Croatia. Of these, 23 (43%) were men and 30 (57%) were women. The median age of the participants was 68 years, with an age range of 30 to 87 years. The study population included participants with various cancer types, with breast cancer being the most common diagnosis, followed by other cancer types (Table 1).

Table 1. Baseline characteristics of participants.

<i>Rosenberg Self-Esteem Scale</i> baseline using has a possible to 40, with	Sex [n (%)]		
	Male	23 (43)	
	Female	30 (57)	
	Age (years)		
	[Median (interquartile range)]	68 (64 - 75)	
	Cancer types [n (%)]		
	Lung cancer	7 (13)	
	Throat cancer	2 (4)	
	Skin cancer	2 (4)	
	Bladder cancer	2 (4)	
	Colon cancer	4 (8)	
	Prostate cancer	6 (11)	
	Breast cancer	15 (28)	
	Breast cancer and lymph node cancer	3 (6)	
	Other forms of cancer	12 (23)	
			<i>Esteem Scale</i> was assessed at the RSES, which score range of 0 higher scores

indicating higher self-esteem. The internal consistency of the scale in this study was good, with a Cronbach's alpha of 0.808. The mean RSES score was 28 (SD = 7), with observed values ranging from 9 to 40. Women demonstrated significantly higher self-esteem scores than men (mean: 30 vs. 25; t-test, $p = 0.006$).

FACT-G reliability, treatment-related changes, and associations with baseline self-esteem

The primary outcome, health-related quality of life, was assessed using the Functional Assessment of Cancer Therapy-General (FACT-G) questionnaire at baseline (before radiotherapy) and post treatment. Changes in FACT-G total and domain scores between baseline and post-treatment assessments were subsequently analyzed. The internal consistency of the FACT-G total score and its subscales was acceptable-to-excellent at both time points, as indicated by Cronbach's alpha coefficients. Cronbach's alpha values ranged from 0.700 to 0.915 across domains, supporting the reliability of the FACT-G questionnaire in this study population. Significant reductions in physical, emotional, and functional well-being domains, as well as in the FACT-G total score, were observed between baseline and post-treatment assessments, indicating a measurable decline in HRQoL (physical, emotional, and functional well-being), while social/family well-being remained unchanged. Baseline self-esteem demonstrated positive correlations with the FACT-G total score and most domain scores at both baseline and post-treatment assessments. Moderate positive correlations were identified for the physical, emotional, and functional well-being domains, as well as for the FACT-G total score. However, no statistically significant association was observed for the social/family well-being domain (Table 2).

Table 2. Internal consistency, treatment-related changes, and associations of baseline self-esteem with FACT-G cores

*Wilcoxon test; bold values denote statistical significance. Abbreviations: IQR—interquartile range; CI—confidence interval; RSES—Rosenberg Self-Esteem Scale; FACT-G—Functional Assessment of Cancer Therapy-General.

	Cronbach's coefficient alpha		Median (IQR) FACT-G		Difference	95% CI	* <i>p</i> -value	Spearman's correlation coefficient (ρ) with baseline RSES (p-value)	
	Baseline	Post treatment	Baseline	Post treatment				Baseline	Post treatment
Physical well-being	0.797	0.811	19 (13 - 24)	17 (12 - 20)	-3	-3 to -2	<0.001	0.539 (<0.001)	0.543 (<0.001)
Social/family well-being	0.708	0.700	25 (21 - 26)	25 (21 - 27)	0	0 to 0	0.47	0.244 (0.08)	0.246 (0.08)
Emotional well-being	0.818	0.837	18 (13 - 22)	16 (12 - 20)	-2	-2 to -1	<0.001	0.632 (<0.001)	0.634 (<0.001)
Functional well-being	0.832	0.847	20 (15 - 24)	19 (15 - 23)	-1	-2 to -0,5	<0.001	0.539 (<0.001)	0.624 (<0.001)
FACT-G	0.906	0.915	81 (68 - 92)	76 (64 - 87)	-5	-6 to -5	<0.001	0.641 (<0.001)	0.658 (<0.001)

Linear regression models were fitted with post-treatment FACT-G total score as the dependent variable and baseline self-esteem as the main independent variable, with additional adjustment for age and sex. Given the sample size, analyses were restricted to the FACT-G total score.

In adjusted linear regression analysis, higher baseline self-esteem was independently associated with a higher post-treatment FACT-G total score ($\beta = 1.22$; 95% CI: 0.71–1.74; p -value < 0.001) after adjustment for age and sex, indicating better HRQoL among participants with higher baseline self-esteem. Age and sex were not significantly associated with the outcome (Table 3).

Table 3. Linear regression analysis of baseline self-esteem associated with post-treatment FACT-G total score, adjusted for age and sex.

	β	95% CI	p-value
Age (years)	-0.14	-0.47 to 0.19	0.39
Sex (female vs. male)	5.62	-1.55 to 12.78	0.12
Baseline RSES	1.22	0.71 to 1.74	<0.001
Model: $R^2_{\text{adj}} = 0.402$; $F(3,49) = 12.65$; $p < 0.001$; Cohen's $f^2 = 0.67$			

Abbreviations: β —unstandardized regression coefficient; CI—confidence interval; RSES—Rosenberg Self-Esteem Scale; FACT-G—Functional Assessment of Cancer Therapy-General.

Discussion

Malignant diseases cause significant changes in the lifestyle of patients and can lead to serious disruptions in daily functioning. Overall, cancer patients often face numerous complex psychological challenges at all stages, from initial diagnosis through treatment and even during rehabilitation. Inevitably, the quality of life of patients and their family members gradually decreases, causing difficulties in performing daily tasks^[7,12].

However, each person has an individual experience, and the way they cope with a cancer diagnosis and their emotional state within a group of cancer patients is a story in itself^[20, 21]. Considering difficulties and individuality is crucial for ensuring comprehensive care, which shows that psychological support is necessary as an integral part of the treatment process for cancer patients. In oncology specifically, psychological factors play an important role. Previous research suggests that support aimed at emotional and mental well-being may be associated with reduced symptoms of depression and anxiety, better treatment adherence, and better overall quality of life^[22]. Furthermore, empirical evidence suggests that psychological status is associated with therapeutic outcomes in oncology patients, highlighting the relevance of psychological functioning within the broader context of cancer care^[23]. In line with previously identified gaps in the literature, where studies have often focused on specific patient subgroups and cross-sectional designs, the present study contributes additional insight into the relationship between self-esteem and HRQoL by employing a prospective design.

Assessing self-esteem is a key aspect of researching individual psychological functioning, particularly among populations facing malignant diseases. It is defined as examining the extent to which individuals believe in their own abilities, values, and decisions. To evaluate self-esteem, various standardized psychological instruments are used, among which the Rosenberg Self-Esteem Scale is the most widely applied^[16]. This scale consists of statements that respondents rate according to their degree of agreement or disagreement, enabling a quantitative assessment of self-esteem levels^[4]. The results obtained in this study demonstrate a wide range of self-esteem scores, indicating pronounced individual differences among participants. Statistically significantly higher self-esteem scores were also observed in women compared with men. The literature confirms that men more frequently experience a greater decline in self-esteem after diagnosis, which is linked to social expectations and perceptions of masculinity, factors that make them less likely to seek emotional support and more reluctant to accept a loss of independence^[24, 25]. These findings underscore the importance of considering self-esteem in both sexes and suggest that male oncology patients may represent a group warranting particular attention in future research and greater supportive care. Together, these findings highlight the variability in self-esteem among oncology patients and underscore its relevance as an important psychological construct.

The numerous physical, emotional, and psychological changes experienced by oncology patients require continuous adaptation and efforts to maintain or improve self-esteem, which represents one of the key

factors in coping with malignant disease. Adaptation can be particularly challenging, as changes in physical appearance may influence self-acceptance and perceptions of self, thereby affecting self-esteem^[26]. A high level of self-esteem, on the other hand, acts as a protective factor, reducing fear of death and treatment side effects while facilitating acceptance of the illness^[27]. Although many cancer patients display a generally positive attitude toward themselves and life, a considerable proportion still struggle with low self-esteem. This highlights the need for systematic psychological support and the integration of psychosocial care into all phases of the oncological therapeutic process^[9]. Structured nursing interventions targeting psychological resources such as hope have similarly been shown to reduce fatigue and improve quality of life in oncology patients, further supporting the value of psychosocially oriented care models^[14].

At the individual level, the emotional experience accompanying a cancer diagnosis most often includes anxiety and emotional stress, primarily resulting from uncertainty surrounding the disease outcome and fear of death itself^[13]. A considerable number of patients also develop depressive symptoms, closely related to the burdens associated with therapeutic procedures and sudden changes in life circumstances. In parallel with emotional stress, cancer patients experience numerous physical changes, such as weight fluctuations, hair loss, and persistent fatigue. The combined effect of physical and emotional changes further undermines self-esteem and body perception, frequently leading to social isolation. In such circumstances, patients often confront existential questions and begin reflecting on the meaning of life^[8,28]. Given that these changes affect various aspects of patients' daily functioning and subjective well-being, it is important to consider them within a broader quality of life framework. Within this context, examining self-esteem alongside HRQoL allows for a more comprehensive understanding of psychological and functional adjustment in oncology patients.

Against this background, to better understand the relationship between self-esteem and broader aspects of well-being, we additionally assessed quality of life using the FACT-G questionnaire, which encompasses physical, emotional, social, and functional dimensions^[18,28]. Previous research suggests that although symptom burden and psychological distress are common among oncology patients, certain aspects of quality of life assessed by the FACT-G, particularly social and family well-being, may remain relatively preserved at specific stages of treatment^[18,28].

In the present study, the FACT-G questionnaire demonstrated acceptable-to-excellent internal consistency across all domains and at both assessment points, indicating that the instrument reliably captured HRQoL in this study population (Table 2.).

Evaluation of pre-post changes in FACT-G total and domain scores showed a measurable decline in several aspects of health-related quality of life, particularly physical, emotional, and functional well-being, while social and family well-being did not change significantly (Table 2.). Our study showed preserved social and family well-being as a notable positive finding, suggesting that social support may play an important role in maintaining overall patient well-being. Strong social support, whether from family or friends, has been shown to reduce anxiety and stress levels, mitigate feelings of social isolation, and promote a sense of safety and emotional comfort^[29]. Positive interactions and supportive social relationships have been associated with greater motivation and higher overall quality of life and may indirectly support engagement with treatment^[30]. Conversely, insufficient social support has been linked to an increased risk of depression, whereas socially active patients tend to exhibit lower rates of depressive symptoms and greater emotional resilience^[31,32]. Taken together, these findings highlight strong and consistent social support as a potential protective factor that may buffer emotional distress and enhance patients' capacity to cope with the challenges of cancer therapy.

In addition to outlining changes in quality of life across various domains, it is crucial to investigate how individual psychological traits correspond to these outcomes. Considering the variability in self-esteem and its possible influence on psychological adjustment, we examined the connection between baseline self-esteem and health-related quality of life, both at the start and following treatment.

Baseline self-esteem was moderately and positively associated with overall health-related quality of life, as well as with physical, emotional, and functional well-being, both before and after treatment (Table 2.). This suggests that individuals with higher self-esteem tend to report better perceived functioning and emotional adjustment across time. In contrast, no significant association was observed with social and family well-being (Table 2.), indicating that this domain may be less dependent on individual self-esteem and more influenced by external sources of support. This pattern suggests that the treatment period may be associated with changes that extend beyond a transient symptom burden and, in a subset of patients, represent a substantial decline in subjective functioning. These findings indicate that the therapeutic process may significantly affect patients' perception of health and everyday functioning, particularly in the domains of physical, emotional, and functional well-being. Similar studies have reported that self-esteem is associated with HRQoL in oncology patients, whereas social well-being appears to be more strongly influenced by external sources of support^[33,34]. This underscores the importance of early identification of

individuals who may be more vulnerable to such declines, as well as the need to integrate multidisciplinary approaches into routine oncological care.

Adjusted regression analysis showed that higher baseline self-esteem was independently associated with better quality of life after treatment, even after controlling for age and sex (Table 3.). This finding suggests that self-esteem assessed prior to treatment may represent an important psychological factor related to patients' subsequent overall functioning and well-being. In contrast, age and sex did not contribute significantly to the model, further underscoring the relative importance of baseline psychological resources in shaping post-treatment quality of life.

Although this study provides a broad overview of psychological and quality of life outcomes in oncology patients, an additional limitation of this study should be noted. In particular, the lack of detailed clinical variables precluded stratified analyses and limits the interpretation of changes in quality of life. Future studies should incorporate more detailed clinical data to enable more precise analyses and to provide a more comprehensive understanding of the factors influencing quality of life in oncology patients during and after treatment. Despite this limitation, this study provides valuable insight into the psychological domains of quality of life in oncology patients, particularly the role of baseline self-esteem.

Conclusions

In this study of oncology patients, health-related quality of life, assessed using the FACT-G questionnaire, declined after treatment, particularly in the domains of physical, emotional, and functional well-being, while social and family well-being remained largely preserved. Baseline general self-esteem, measured by the Rosenberg Self-Esteem Scale, was positively associated with overall quality of life and with most FACT-G domains at both baseline and post-treatment assessments. In adjusted analyses, higher baseline self-esteem remained independently associated with higher total FACT-G scores after treatment. However, given the observational design of this study, causal conclusions regarding the influence of self-esteem on treatment outcomes cannot be drawn. Taken together, these findings suggest that baseline self-esteem is meaningfully associated with patients' perceived quality of life during cancer treatment and may represent a relevant self-reported psychological characteristic. Future research with larger samples and interventional designs is warranted to further clarify the role of self-esteem in the context of oncological treatment and supportive care.

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