Research article
UDC 616-01
https://doi.org/10.21702/rpj.2025.3.9

Validation of the Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment in Cancer Patients Receiving Chemotherapy and Radiation Therapy

Marina K. Karakurkchi[1], Aleksander Sh. Tkhostov[2], Elena I. Rasskazova[2], Sofia A. Kirsanova[2]

[1] S.S. Yudin City Clinical Hospital, Moscow, Russian Federation
[2] Lomonosov Moscow State University, Moscow, Russian Federation

Corresponding author: karakyrkchi_m@mail.ru

Abstract

Introduction. According to Self-Determination Theory (SDT), the satisfaction of basic psychological needs for autonomy, competence, and relatedness is associated with subjective well-being, treatment motivation, and adherence—particularly in cancer patients. The aim of this study was to validate the Scale of Satisfaction of Basic Psychological Needs in the Context of Treatment in cancer patients receiving chemotherapy and radiation therapy. **Methods.** The study included 203 cancer patients undergoing systemic anticancer treatment. The assessment instruments were: the Scale of Satisfaction of Basic Psychological Needs in the Context of Treatment (Kovyazina et al., 2019), the Illness Perception Questionnaire–Revised (Moss-Morris et al., 2002; Rasskazova, 2016), and the Illness and Treatment Self-Regulation Questionnaire (Kovyazina et al., 2019). **Results.** The scale demonstrated adequate internal consistency (with the exception of the Autonomy subscale, which requires further investigation) and acceptable factor validity. Higher satisfaction of basic psychological needs was associated with greater treatment self-efficacy and lower levels of health anxiety and helplessness. Patients receiving radiation

therapy reported higher satisfaction of basic psychological needs compared to those undergoing chemotherapy. **Discussion.** The findings support the use of this scale for assessing basic psychological needs satisfaction in cancer patients undergoing treatment. Such assessment may facilitate the development and implementation of psychological interventions aimed at enhancing treatment motivation and improving engagement in rehabilitation.

Keywords

psychodiagnostics, self-determination theory, satisfaction of basic psychological needs, oncological diseases, chemotherapy and radiation therapy

Acknowledgments

The authors express their profound respect and gratitude, as well as their sorrow, at the untimely passing of the distinguished clinical psychologist, our co-author and colleague Aleksander Sh. Tkhostov, who made a significant contribution to the advancement of psychological science.

For citation

Karakurkchi, M. K., Tkhostov, A. Sh., Rasskazova, E. I., Kirsanova, S. A. (2025). Validation of the Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment in Cancer Patients Receiving Chemotherapy and Radiation Therapy. *Russian Psychological Journal*, 22(3), 153—174. https://doi.org/10.21702/rpj.2025.3.9

Introduction

Psychological adaptation to oncological diseases and their treatment is a long, complex, and dynamic process that requires patients' active and purposeful involvement. It begins at the stage of diagnosis (Secinti et al., 2019) and continues through antineoplastic drug therapy and surgical interventions. The post-treatment period is characterized by long-term medical monitoring, fear of recurrence (Tauber, 2019), and challenges in social reintegration (Andrykowski, Lykins, & Floyd, 2008). The quality of life of cancer patients declines at every stage of treatment, starting from diagnosis (Lewandowska, 2022; Mehnert et al., 2018).

Patients' behavior during treatment is closely related to their subjective well-being (Shagarova, 2019). Encouraging cancer patients to engage actively in treatment is an essential component of psychological support.

According to self-determination theory (Ryan & Deci, 2000), health, well-being, and motivation to seek treatment among patients with mental and somatic conditions are determined by the extent to which their basic psychological needs are satisfied (Sheldon et al., 2003). Autonomy refers to the need to experience a sense of volition and self-direction in one's life and actions. It is associated with the development of intrinsic motivation, which in turn fosters greater personal engagement in activities. Competence is the need to feel effective and capable of mastering tasks and challenges. Relatedness reflects the need to establish and maintain meaningful connections with others. The satisfaction of these basic psychological needs is linked to both the quality of life and treatment adherence of patients with somatic conditions (Xia et al., 2023).

The extent to which patients receive tangible social support from family and loved ones, as well as from the interdisciplinary oncology team, along with autonomy support within the medical process, determines not only their quality of life but also their engagement in and satisfaction with treatment (Kroemeke, 2022; Bonetti et al., 2022).

Psychological support at different stages of treatment, tailored to the individual's personal values and meaning orientations, can facilitate adaptation; however, it is not always accompanied by a positive emotional state (Hulbert-Williams et al., 2018).

Lynch and Lee (2021) investigated the roles of social support and psychological needs in predicting social well-being among older adult cancer survivors. They found that social support is positively associated with social well-being, with support from family and friends emerging as a significant predictor even after controlling for key demographic variables. Similarly, Rivera-Rivera (2021) reported that social support from family members and friends significantly predicts social well-being. Moreover, the satisfaction of basic psychological needs—autonomy, competence, and relatedness—was identified as an important predictor of social well-being.

Kroemeke and Sobczyk-Kruszelnicka (2022) explored how healthcare professionals provide autonomy support within patient–caregiver dyads and how this support influences patients' well-being following hematopoietic cell transplantation. Their data indicated that patients' perceptions of the autonomy support they received were associated with positive emotions and satisfaction with their relationships. In a study on maintaining autonomy in individuals with intellectual disabilities, Stefánsdóttir et al. (2018) concluded that, even among those with severe intellectual disabilities, individuals can achieve greater autonomy through specific interactions and support from family members and loved ones.

A meta-analysis of experimental studies based on self-determination theory (SDT) in healthcare (Ntoumanis et al., 2021) demonstrated the effectiveness of SDT interventions, with the strongest effects arising from autonomy support and competence development, the creation of environments that satisfy basic psychological needs, and the promotion of autonomous motivation.

In this context, it is crucial to develop and validate methodologies across various clinical populations that assess the satisfaction of autonomy, competence, and relatedness needs in relation to treatment and rehabilitation. A corresponding scale was subsequently developed and underwent initial testing in a sample of patients who had experienced a stroke (Kovyazina et al., 2016, 2017, 2019). However, no studies have examined the relationship between the satisfaction of basic psychological needs and subjective well-being or quality of life in patients with other medical conditions, nor has the questionnaire been tested in cancer patients.

The aim of the research is to validate a scale assessing the satisfaction of autonomy, competence, and relatedness needs in relation to treatment among cancer patients undergoing chemotherapy and radiotherapy.

Research objectives:

1. To assess the reliability, internal consistency, and factorial validity of the scale in cancer patients.
2. To identify the relationships of gender and age with the satisfaction of basic needs related to treatment in cancer patients.
3. To compare satisfaction with basic needs related to treatment across patients undergoing chemotherapy versus radiotherapy.
4. To examine the associations between autonomy, competence, and relatedness in relation to treatment and patients' perceptions of their illness and treatment.

Methods

The study was conducted at S.S. Yudin City Clinical Hospital, Moscow, Russian Federation; N.N. Blokhin National Medical Research Center of Oncology, Moscow, Russian Federation; and MEDSI International Oncology Center, Moscow, Russian Federation.

The study included 203 cancer patients receiving systemic antineoplastic therapy, comprising 149 women and 54 men (mean age = 49.94 $\pm$ 12.20 and 46.50 $\pm$ 12.68 years, respectively). The distribution of patients by diagnostic category was as follows: 37% had breast cancer, 20% had malignant neoplasms of the intestine, and the remaining patients were diagnosed with oncological diseases of other localizations.

A total of 149 participants (103 women and 46 men) were receiving chemotherapy (CT), and 54 participants (46 women and 8 men) were receiving radiation therapy (RT). At the time of assessment, all participants were undergoing active treatment — either chemotherapy (CT) or radiotherapy (RT). Some patients were receiving neoadjuvant chemotherapy, while those undergoing RT had previously undergone surgical intervention and chemotherapy.

Eighty-nine participants reported having an additional chronic condition, 99 reported no comorbidities, and for 15 participants this information was not available. This variable

was considered relevant due to the potential influence of comorbid medical burden and prior experience with chronic illness on the satisfaction of psychological needs.

Respondents completed the following questionnaires:

1. Scale of Satisfaction of Basic Psychological Needs in the Context of Treatment (M.S. Kovyazina et al.; see Appendix 1), which is a modification of T.O. Gordeeva's (2015) Basic Psychological Needs Questionnaire.
2. Illness Perception Questionnaire–Revised (IPQ-R; Moss-Morris et al., 2002) in the Russian adaptation by Rasskazova (2016), designed to assess the cognitive component of illness representation. The questionnaire consists of three sections: *Identity*, *Illness Representations*, and *Causes of Illness*. In the present study, only the *Illness Representations* section was used, with questions referring specifically to the respondents' current oncological disease. This section includes 38 statements rated on a 5-point Likert scale (from 1 = "strongly disagree" to 5 = "strongly agree") and comprises the and comprises the following subscales: 1) *Timeline* (acute/chronic), which reflects perceptions of how long the illness will last; 2) *Consequences*, which represents the perceived negative impact of the illness on life; 3) *Personal control*, which indicates the perceived ability to control the illness; 4) *Treatment control*, which reflects confidence in the effectiveness and importance of treatment; 5) *Illness coherence*, which reflects the perceived understanding (or lack of understanding) of the illness (reverse item); 6) *Timeline* (cyclical), which represents perceptions of the cyclical nature of the illness; and 7) *Emotional representations*, which describe emotional responses related to the illness.
3. Illness and Treatment Self-Regulation Questionnaire (Kovyazina et al., 2019), which assesses patients' current attitudes and decisions regarding their health and treatment. It includes the following subscales: Health Anxiety, Helplessness in the Rehabilitation Process, and Self-Efficacy in the Rehabilitation Process.

Statistical analysis was performed in RStudio (version 2024.09.0) using functions from the *psych* (version 2.4.6.26), *tidyverse* (2.0.0), and *lavaan* (0.6.19) packages, as well as functions from the base R library (version 4.3.3).

The reliability of the scales was assessed using Cronbach's alpha (α). Structural (factorial) validity of the instrument was evaluated by means of confirmatory factor analysis (CFA). Since the individual items used ordinal (Likert-type) scales, a CFA method designed for ordinal data and robust to non-normality was applied—specifically, the diagonally weighted least squares (DWLS) estimation method.

The following indices were used to evaluate model fit: root mean square error of approximation (RMSEA; the model is considered a good fit for RMSEA < 0.08), comparative fit index (CFI), and Tucker–Lewis index (TLI). Values of CFI and TLI of ≥ 0.90 are regarded as acceptable, and ≥ 0.95 as good (Hu & Bentler, 1999).

Intercorrelations among the scales and analyses of external validity (correlations with scores from other instruments) were assessed using correlation coefficients; given

the non-normal distribution of the scales, the Spearman correlation coefficient was calculated.

Differences between male and female participants were compared using Welch's t-test (an adaptation of Student's t-test for unequal variances).

Results

Reliability, internal consistency, and factorial structure of the scale

Structural validity of the three-factor model was assessed to examine the factor structure. Confirmatory factor analysis (CFA) was conducted using maximum likelihood estimation. Model fit indices fell below commonly accepted thresholds, although they approached acceptable levels: $\chi2(123) = 416.404$, $p < 0.001$, RMSEA = 0.106, CFI = 0.839, TLI = 0.813.

In this model, factor loadings were statistically significant at $p < 0.001$ for all items except Item 13. Item 13, formulated as "I feel that I choose my treatment approaches as I see fit" [Я чувствую, что сам выбираю свои способы лечения так, как я сам считаю нужным], belongs to the Autonomy scale. The wording of the question likely sounds contradictory for oncological patients due to the specific nature of cancer disease and treatment and, in essence, the lack of alternatives in prescribed treatment regimens, which are often complex and accompanied by pronounced adverse effects causing patient suffering. Following removal of this item from the model, fit indices increased somewhat but remained below commonly accepted criterion values: $\chi2(116) = 340.728$, $p < 0.001$, RMSEA = 0.100, CFI = 0.870, TLI = 0.848.

Based on technical assessment using modification indices and given the substantive content links identified, correlations were added in the formulations of the following item pairs: 3–5, 6–14, 8–10. Items 3 and 5 address the theme of emotional support from healthcare providers; items 6 and 14 address the theme of pressure and conflict related to treatment process participants; items 8 and 10 address the theme of rehabilitation task completion effectiveness. The final model demonstrated acceptable fit indices: $\chi2(113) = 270.970$, $p < 0.001$, RMSEA = 0.085, CFI = 0.909, TLI = 0.890. All factor loadings differed significantly from zero at $p < 0.001$. Standardized factor loadings are presented in Table 1.

In the one-factor model, analysis yielded less acceptable fit indices: $\chi2(104) = 432.187$, $p < 0.001$, RMSEA = 0.128, CFI = 0.811, TLI = 0.789. Following the addition of correlations, fit indices became more acceptable: $\chi2(99) = 273.420$, $p < 0.001$, RMSEA = 0.095, CFI = 0.900, TLI = 0.878. All factor loadings differed significantly from zero at $p < 0.001$.

Table 1
Standardized Factor Loadings in the Three-Factor Model

Factor	Item Number	Loading	Standard Error
Relatedness	SDT1	0.859	0.041
	SDT3	0.584	0.056
	SDT5	0.572	0.058
	SDT2	-0.577	0.058
	SDT4	-0.706	0.057
	SDT6	-0.574	0.070
Competence	SDT7	0.761	0.036
	SDT9	0.750	0.037
	SDT11	0.771	0.037
	SDT8	-0.549	0.048
	SDT10	-0.371	0.063
	SDT12	-0.587	0.050
Autonomy	SDT15	0.307	0.068
	SDT17	0.713	0.065
	SDT14	-0.456	0.076
	SDT16	-0.255	0.070
	SDT18	-0.395	0.066

Note. ** all factor loadings differed significantly from zero at p <0.001.*

This model showed strong correlations between the factors Relatedness and Competence ($r = 0.639$, $p < .001$) and between Relatedness and Autonomy ($r = 0.642$, $p < .001$). The very high correlation between the Relatedness and Autonomy subscales ($r = 0.922$, $p < .001$) suggests substantial overlap between these dimensions.

Reliability analysis indicated that the Relatedness and Competence scales demonstrated relatively high internal consistency (Cronbach's $\alpha = 0.741$ and 0.734, respectively), whereas the Autonomy scale showed low reliability (Cronbach's $\alpha = 0.438$), reflecting heterogeneity within this subscale. Overall, the questionnaire exhibited satisfactory reliability (Cronbach's $\alpha = 0.807$).

Descriptive statistics for the three subscales and the overall scale are presented in Table 2.

Table 2

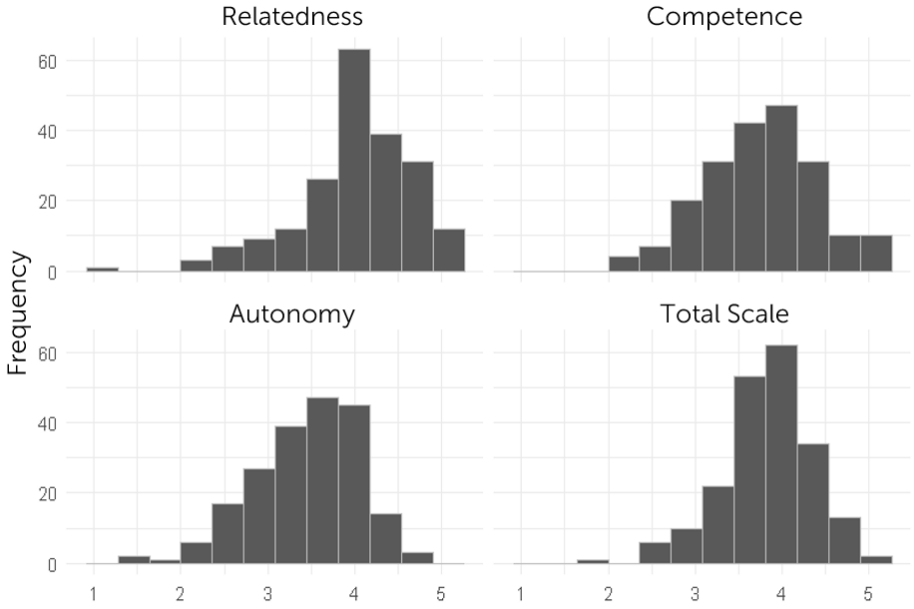
Descriptive Statistics for the Basic Needs Satisfaction Questionnaire Scales

Scale	Mean (SD)	Skewness	Normality Test Result*
Relatedness	4.026 (0.668)	-0.962	< 0.001
Competence	3.76 (0.643)	-0.044	0.017
Autonomy	3.441 (0.595)	-0.370	0.012
Total Scale	3.833 (0.52)	-0.460	0.019

Note. **Shapiro-Wilk test of normality.*

The distributions of all scales in the questionnaire deviated significantly from normality. Examination of the scale distributions (see Fig. 1) revealed some skewness, with scores shifted toward lower values; however, no ceiling or floor effects were observed. The distributions of scores are presented in Figure 1.

Figure 1
Distribution of Basic Needs Satisfaction Scales



The distribution of scores across questionnaire scales was analyzed to examine empirical relationships between scales using Spearman's rank correlation. Results revealed significant correlations between Relatedness and Competence: $r = 0.429$, $p < 0.001$; between Relatedness and Autonomy: $r = 0.322$, $p < 0.001$; and between Competence and Autonomy: $r = 0.487$, $p < 0.001$.

Comparison of scale scores between men and women revealed no significant differences across all scales.

No significant correlations were found between basic needs satisfaction scales, age, disease duration, and functional status.

Comparison of groups with and without comorbid chronic conditions revealed no significant differences.

Comparison of Two Types of Treatment

Comparison of results between the two treatment groups showed that patients receiving radiotherapy demonstrated significant differences on the overall scale of satisfaction of basic psychological needs, as well as a marginally significant difference on the Competence subscale. In both cases, the mean scores were higher in the radiotherapy group (see Table 3).

Table 3

Comparison of Two Types of Treatment

Scale	Treatment Type		t-Test Result	Effect Size (Cohen's d)
	CT	RT		
Relatedness	3.984 (0.693)	4.142 (0.583)	t(110.7) = -1.616, p= 0.109	-0.246
Competence	3.707 (0.634)	3.908 (0.651)	t(92.1) = -1.961, p= 0.053	-0.314
Autonomy	3.638 (0.665)	3.781 (0.608)	t(102.6) = -1.446, p= 0.151	-0.225
Total Scale	3.79 (0.535)	3.953 (0.461)	t(108.3) = -2.138, p= 0.035	-0.328

Relationship between the Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment and the Illness Perception Questionnaire–Revised, attitudes toward treatment, and self-regulation in the rehabilitation process

During the analysis of the relationships between the Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment and the Illness Perception Questionnaire–Revised, negative correlations were found between Emotional representations and the Total Scale, between Consequences and the Total Scale, and between Consequences and Competence. In other words, the higher the subjective perception of the satisfaction of psychological needs in treatment, the less likely patients are to develop emotional representations of the illness and its consequences. The higher the subjective perception of the satisfaction of the need for competence, the less negative the representations of the illness consequences. Significant positive correlations were identified between Treatment control and the Total Scale, between Illness coherence and Competence, and between Treatment control and Relatedness.

Parameter *Autonomy* shows the weakest correlations compared to the other scales, while the strongest correlations are observed with *Total Scale* and *Competence*. Complete data on correlations between the scales of the two questionnaires are presented in Table 4.

Table 4

Relationship Between Satisfaction of Basic Psychological Needs and Illness Representation: Pearson Correlation Analysis

Illness Representations	Relatedness	Competence	Autonomy	Total Scale
Timeline (acute/ chronic)	r = -0.14, p = 0.041	r = -0.1, p = 0.137	r = -0.069, p = 0.329	r = -0.15, p = 0.036
Timeline (cyclical)	r = -0.13, p = 0.07	r = -0.27, p < 0.001	r = 0.001, p = 0.991	r = -0.19, p = 0.008
Consequences	r = -0.22, p = 0.002	r = -0.34, p < 0.001	r = -0.24, p < 0.001	r = -0.36, p < 0.001
Personal control	r = 0.12, p = 0.076	r = 0.23, p < 0.001	r = 0.12, p = 0.084	r = 0.19, p = 0.006
Treatment control	r = 0.36, p < 0.001	r = 0.32, p < 0.001	r = 0.2, p = 0.004	r = 0.39, p < 0.001
Illness coherence	r = 0.23, p = 0.001	r = 0.38, p < 0.001	r = 0.26, p < 0.001	r = 0.36, p < 0.001
Emotional representations	r = -0.35, p < 0.001	r = -0.38, p < 0.001	r = -0.26, p < 0.001	r = -0.41, p < 0.001

The obtained results confirm significant relationships with all three scales of the tested questionnaire. *Autonomy* shows the weakest but significant negative correlations with the scales *Health Anxiety* and *Helplessness in the Rehabilitation Process*. In other words, the higher the subjective evaluation of satisfaction of the need for autonomy, the lower the perceived health anxiety and the sense of helplessness in the rehabilitation process. A strong negative correlation is shown between the scale *Health Anxiety* and the scale *Competence*, i.e., the higher the subjective evaluation of satisfaction of the need for competence, the less patients tend to report health anxiety. Significant negative correlations with the overall needs satisfaction scale were found for *Helplessness in the Rehabilitation Process* and *Health Anxiety*, and a positive one with the scale *Self-Efficacy in the Rehabilitation Process*. In other words, the data indicate that the higher the patients' subjective perception of satisfaction of needs in treatment, the less they tend to report health anxiety and helplessness during rehabilitation and the more they report self-efficacy in the rehabilitation process.

Significant negative correlations were found between the scale *Relatedness* and the scales *Helplessness in the Rehabilitation Process* and *Health Anxiety*, and a positive correlation with the scale *Self-Efficacy in the Rehabilitation Process*. In other words, the

stronger the subjective sense of satisfaction of the need for relatedness, the less patients tend to exhibit health anxiety and report helplessness during rehabilitation, and the more they tend to feel self-efficacy in the rehabilitation process.

All correlations, except for the pair *Self-Efficacy in the Rehabilitation Process–Autonomy*, are statistically significant. Complete data on correlations between the scales of the two questionnaires are presented in Table 5.

Table 5

Correlation Analysis Between the Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment and the Illness and Treatment Self-Regulation Questionnaire

Illness and Treatment Self-Regulation Questionnaire	Relatedness	Competence	Autonomy	Total Scale
Health Anxiety	r = -0.28, p < 0.001	r = -0.39, p < 0.001	r = -0.21, p = 0.002	r = -0.36, p < 0.001
Helplessness in the Rehabilitation Process	r = -0.28, p < 0.001	r = -0.35, p < 0.001	r = -0.17, p = 0.018	r = -0.38, p < 0.001
Self-Efficacy in the Rehabilitation Process	r = 0.25, p < 0.001	r = 0.36, p < 0.001	r = 0.14, p = 0.055	r = 0.35, p < 0.001

Discussion

Reliability, internal consistency, and factorial structure of the scale

The analysis of the obtained results indicates that the questionnaire demonstrates adequate internal reliability. Acceptable model fit indices were also observed, although they were less robust in the one-factor model. The high correlations among all factors and the low discriminant validity of the scales are likely attributable to the substantial interconnectedness and interdependence of the basic psychological needs themselves. This interdependence may also be reflected in the way patients interpret the questionnaire items, as well as in the screening nature of the instrument, where the limited number of items per scale may be insufficient for a more differentiated assessment. A larger sample size would allow for a more comprehensive evaluation of this convergence. This explanation remains hypothetical and requires further verification; however, the current findings suggest that the internal consistency of the Autonomy scale, considered as a homogeneous construct, is limited. Overall, both the one-factor and three-factor models demonstrate generally acceptable fit. Nevertheless, the three-factor model shows superior fit indices, and all factor loadings are substantial and statistically significant in both models.

Thus, the instrument can be considered to demonstrate adequate structural validity.

Associations Between Gender, Age, Disease Duration, Treatment Type, and Satisfaction of Basic Psychological Needs During Treatment

No significant correlations were identified between the *Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment* and age, disease duration, the presence or absence of comorbidity, or functional status. These results suggest a relative independence of basic psychological needs satisfaction in treatment from sociodemographic and clinical factors. However, given that the sample did not include patients receiving palliative care or those in terminal stages of illness, these findings should be interpreted in light of these limitations.

Significant differences were observed on the *Total Scale* of needs satisfaction, as well as a marginally significant difference on the *Competence* scale. In both cases, mean values were higher in the radiation therapy group. This may be explained by the fact that patients receiving radiation therapy had previously undergone chemotherapy and surgical treatment, whereas patients receiving chemotherapy had not received other modalities of systemic anticancer treatment. According to the clinical practice guidelines for breast cancer pharmacotherapy (Tyulyandin et al., 2022), the recommended first-line treatment for primary breast cancer is neoadjuvant chemotherapy, while radiation therapy represents the final treatment phase prior to follow-up surveillance, administered after breast-conserving surgery or mastectomy and preceded by one or more courses of chemotherapy or hormone therapy.

Patients receiving neoadjuvant chemotherapy for breast cancer—often asymptomatic at presentation—experience treatment-related adverse effects and uncertainty regarding surgical options (breast-conserving surgery versus mastectomy). Similarly, patients undergoing post-neoadjuvant or adjuvant chemotherapy following surgical treatment (37% of the sample) may demonstrate different patterns of needs satisfaction compared to patients receiving radiation therapy as a sequential or final treatment course. This difference may be attributable not only to the type of treatment modality but also to additional factors, including surgical recovery and adaptation, experience with more complex treatment schedules, optimism regarding treatment completion, and associated psychosocial variables.

The difference observed on the *Competence* scale may be related to patients' cumulative treatment experience and to their differential perception of various systemic anticancer modalities. Chemotherapy, as a systemic therapeutic intervention affecting the entire body, is often associated with significant apprehension about treatment-related adverse events and uncertainty regarding the unpredictable nature, frequency, and intensity of these adverse effects. Chemotherapy-induced adverse effects constitute distinct medical conditions that often require additional supportive management. The difficulty of predicting the type and severity of adverse effects may contribute to substantial concerns regarding treatment necessity and efficacy.

Although the chemotherapy administration process itself is more familiar to patients (Tkhostov, 2002) compared to radiation therapy procedures, concerns regarding the necessity of chemotherapy tend to be more pronounced. Radiation therapy prescription is generally associated with fewer doubts; however, the organization of radiation therapy—involving invisible radiation and the unclear, seemingly "magical" manner of its delivery through specialized apparatus under specific conditions—is likely associated with increased susceptibility to magical thinking and may elicit both placebo and nocebo effects (Tkhostov, 2002). Patients typically have limited knowledge about radiation therapy (Zinchenko et al., 2020), and its adverse effects are perceived as less predictable, which depending on the clinical context may provoke either reassurance or increased anxiety. Confidence in the necessity of radiation therapy is not necessarily associated with the absence of doubts or overall patient well-being (Zinchenko et al., 2020); however, the decision to receive radiation therapy may be perceived as more autonomous, potentially leading to a subjective sense of greater satisfaction of basic psychological needs. To our knowledge, no studies directly compare attitudes toward radiation therapy as a primary systemic anticancer treatment with attitudes among patients who previously received chemotherapy prior to radiation therapy. Treatment modality appears to be an important but not the sole factor influencing patient well-being and satisfaction of psychological needs.

External Validity of the Questionnaire: Relationships with the Illness Perception Questionnaire–Revised and the Illness and Treatment Self-Regulation Questionnaire

The obtained data indicate that higher satisfaction of basic psychological needs is associated with a greater sense of treatment control and illness coherence, and, conversely, with reduced tendencies toward emotional representations of the illness and negative perceptions of its consequences. The Autonomy parameter shows the weakest correlations compared with the other scales, whereas the strongest correlations are observed with the Total Scale and the Competence scale.

Similar results were found in the context of pain management: higher satisfaction of psychological needs was associated with greater engagement in active pain management strategies and reduced reliance on avoidance behaviors. It is likely that the satisfaction of basic psychological needs contributes to enhanced psychological resilience and a greater capacity to maintain realistic appraisals of illness-related threat (Ionescu et al., 2023). In other words, higher subjective satisfaction of basic psychological needs in the treatment context is associated with reduced formation of emotional representations of the disease and its consequences. These results correspond with findings from research on motivation for physical activity (Ntoumanis et al., 2021), where the quality of motivation—autonomous versus controlled—rather than the presence or absence of illness, served as the primary predictor of physical activity engagement. This suggests that the relationship between Self-Determination Theory (SDT) constructs and illness perception may be bidirectional and mutually reinforcing.

Our findings also align with existing literature showing that individuals' appraisal of basic psychological needs satisfaction is associated with their selection of health behaviors, which in turn influences subjective well-being (Kim et al., 2023). The Common Sense Model of illness adaptation (Leventhal et al., 2016) posits that cognitive appraisal of illness plays a central role in shaping adaptive coping strategies (Moss-Morris et al., 2002). Within this framework, patient competence serves a dual function: it is both an ethical imperative in medical practice—supporting informed participation and autonomy—and a fundamental psychological need which, when fulfilled, enhances treatment outcomes. Addressing this dual role requires collaborative work between healthcare providers and patients to create conditions supportive of competence and other basic psychological needs. Such collaboration is most effectively achieved through clinical interventions and medical-psychological support specifically designed to promote the satisfaction of these needs.

Higher satisfaction of basic psychological needs is also associated with lower levels of helplessness and health anxiety, as well as higher self-efficacy during rehabilitation. These findings, particularly the association between satisfaction of the need for relatedness, increased rehabilitation-related self-efficacy, and reduced helplessness, are consistent with existing research. A longitudinal study by Schroevers et al. (2010) showed that emotional support received within the first three months after diagnosis predicted more positive perceptions of illness consequences eight years later. In other words, posttraumatic growth was significantly associated with early social support in the initial post-diagnosis period.

These results are theoretically expected and can be explained through bidirectional mechanisms. They are consistent with empirical literature demonstrating the influence of perceived social support on subjective well-being. The association between SDT constructs and reduced health anxiety aligns with findings from other studies showing that satisfaction of basic psychological needs is linked to better self-rated physical and mental health status (Leow, Lynch, & Lee, 2021).

Conclusion

The findings of this study support several key conclusions:

1. The Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment demonstrates adequate internal consistency and factor validity, with the exception of the Autonomy subscale, which requires further refinement. These psychometric properties support the use of the Competence and Relatedness subscales, as well as the Total Scale score, for assessing satisfaction of basic psychological needs in future research.

2. The *Autonomy* subscale exhibited lower internal consistency relative to the other scales, which may reflect the specific characteristics of autonomy perception among cancer patients undergoing active treatment.

3. Higher satisfaction of basic psychological needs was associated with greater treatment-

related self-efficacy and lower levels of health anxiety and helplessness, indicating a meaningful relationship between satisfaction of basic psychological needs and adaptive coping within the treatment process.

4. No significant differences in basic psychological needs satisfaction were found across gender, age, disease duration, or comorbidity status, suggesting that these sociodemographic and clinical variables do not substantially influence the assessed constructs within this sample.

5. Patients receiving radiation therapy reported higher satisfaction of basic psychological needs compared to those receiving chemotherapy. This difference may reflect variations in treatment trajectory, perceived treatment burden, and subjective appraisal of treatment phases.

Overall, these results demonstrate the utility of the *Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment* for evaluating basic psychological needs satisfaction among cancer patients undergoing treatment. Such assessment may support the development of targeted psychological interventions aimed at strengthening treatment motivation and rehabilitation engagement. Future research should prioritize improving the internal consistency of the Autonomy subscale and further examining the associations between basic psychological needs satisfaction, subjective well-being, and health outcomes in oncology populations.

References

Andrykowski, M. A., Lykins, E., & Floyd, A. (2008). Psychological health in cancer survivors. *Seminars in Oncology Nursing, 24(3),* 193–201. https://doi.org/10.1016/j.soncn.2008.05.007

Bonetti, L., Tolotti, A., Anderson, G., Nania, T., Vignaduzzo, C., Sari, D., & Barello, S. (2022). Nursing interventions to promote patient engagement in cancer care: A systematic review. *International Journal of Nursing Studies, 133*, 104289. https://doi.org/10.1016/j.ijnurstu.2022.104289

Gordeeva, T.O. (2015). *Psychology of Achievement Motivation (2nd ed.*). Smysl. (In Russ.).

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6(1)*, 1–55. https://doi.org/10.1080/10705519909540118

Hulbert-Williams, N. J., Beatty, L., & Dhillon, H. M. (2018). Psychological support for patients with cancer: Evidence review and suggestions for future directions. *Current Opinion in Supportive and Palliative Care, 12*(3), 276–292. https://doi.org/10.1097/SPC.0000000000000360

Ionescu, C. M., Mun, C. J., & Burns, J. W. (2023). The role of self-determination theory in pain management: A systematic review and meta-analysis. *The Journal of Pain, 24(5),* 757–772. https://doi.org/10.1016/j.jpain.2022.12.006

Kim, C.-J., Yun, H.-W., Kang, H. S., Jung, J.-Y., & Schlenk, E. A. (2023). Predicting physical activity and sarcopenia-related health outcomes in women with rheumatoid arthritis: A test of the self-determination theory. *Nursing Open, 10,* 6369–6380. https://doi.org/10.1002/nop2.1885

Kovyazina, M., Rasskazova, E., Prigorneva, E., Varako, N. (2019). Self-determination theory in rehabilitation of patients with somatic and mental illnesses: Validation of Illness and Treatment Self-Regulation Questionnaire in the Russian neurological sample. *European Psychiatry*, 56S, S699.

Kovyazina, M. S., Varako, N. A., & Rasskazova, E. I. (2017). Psychological aspects of rehabilitation. *Voprosy Psikhologii, 3*, 40–50. (In Russ.).

Kroemeke, A., & Sobczyk-Kruszelnicka, M. (2022). Daily analysis of autonomy support and well-being in patient-caregiver dyads facing haematopoietic cell transplantation. *British Journal of Health Psychology, 27(3),* 789–801. https://doi.org/10.1111/bjhp.12573

Leow, K., Lynch, M. F., & Lee, J. (2021). Social support and well-being in older cancer survivors. *International Journal of Aging and Human Development, 92(1),* 100–114. https://doi.org/10.1177/0091415019887688

Leventhal, H., Phillips, L. A., & Burns, E. (2016). The Common-Sense Model of Self-Regulation (CSM): A dynamic framework for understanding illness self-management. *Journal of Behavioral Medicine, 39(6),* 935–946. https://doi.org/10.1007/s10865-016-9782-2

Lewandowska, A., Rudzki, G., Lewandowski, T., Stryjkowska-Góra, A., & Rudzki, S. (2022). Risk factors for the diagnosis of colorectal cancer. *Cancer Control*, 29. https://doi.org/10.1177/10732748211056692

Lynch, M. F., & Lee, C. S. (2021). The contribution of social support and psychological needs to social well-being in older adult cancer survivors. *Journal of Psychosocial Oncology, 39(5),* 666–680. https://doi.org/10.1080/07347332.2020.1870642

Mehnert, A., Hartung, T. J., Friedrich, M., Vehling, S., Brähler, E., Härter, M., Keller, M., Schulz, H., Wegscheider, K., Weis, J., Koch, U., & Faller, H. (2018). One in two cancer patients is significantly distressed: Prevalence and indicators of distress. *Psycho-oncology, 27*(1), 75–82. https://doi.org/10.1002/pon.4464

Moss-Morris, R., Weinman, J., Petrie, K. J., Horne, R., Cameron, L. D., & Buick, D. (2002). The Revised Illness Perception Questionnaire (IPQ-R). *Psychology and Health, 17(1),* 1–16. https://doi.org/10.1080/08870440290001494

Ntoumanis, N., Ng, J. Y. Y., Prestwich, A., Quested, E., Hancox, J. E., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Lonsdale, C., & Williams, G. C. (2021). A meta-analysis of self-determination theory-informed intervention studies in the health domain: effects on motivation, health behavior, physical, and psychological health. *Health Psychology Review, 15(2),* 214–244. https://doi.org/10.1080/17437199.2020.1718529

Rasskazova, E. I. (2016). Russian version of the Illness Perception Questionnaire (IPQ-R): validation in the patients with non-psychotic depressions. Lomonosov Psychology Journal, 1, 123–142. (In Russ.).

Rivera-Rivera, J. N., Badour, C. L., & Burris, J. L. (2021). The association between psychological functioning and social support and social constraint after cancer diagnosis: a 30-day daily diary study. *Journal of Behavioral Medicine, 44,* 355–367. https://doi.org/10.1007/s10865-021-00200-6

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55(1),* 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Schroevers, M. J., Helgeson, V. S., Sanderman, R., & Ranchor, A. V. (2010). Type of social support matters for prediction of posttraumatic growth among cancer survivors. *Psycho-Oncology, 19(1),* 46–53.

Secinti, E., Tometich, D. B., Johns, S. A., & Mosher, C. E. (2019). The relationship between acceptance of cancer and distress: A meta-analytic review. *Clinical Psychology Review, 71,* 27–38. https://doi.org/10.1016/j.cpr.2019.05.001

Shagarova, I. V. (2019). Situational determinants of coping behaviour in the situation of oncological disease. *Herald of Omsk University, 3,* 84–88. (In Russ.).

Sheldon, K. M., Williams, G., & Joiner, T. (2003). Self-determination theory in the clinic: Motivating physical and mental health. *Yale University Press*.

Stefánsdóttir, G., Björnsdóttir, K., & Stefánsdóttir, Á. (2018). Autonomy and people with

intellectual disabilities who require more intensive support. *Scandinavian Journal of Disability Research, 20(1),* 162–171. https://doi.org/10.16993/sjdr.21

Tauber, N. M., O'Toole, M. S., Dinkel, A., Galica, J., Humphris, G., Lebel, S., & Maheu, C. (2019). Effect of psychological intervention on fear of cancer recurrence: A systematic review and meta-analysis. *Journal of Clinical Oncology, 37(31),* 2899–2915. https://doi.org/10.1200/JCO.19.00572

Tkhostov, A. Sh. (2002). *Psychology of embodiment.* Smysl. (In Russ.).

Tyulyandin, S. A., Artamonova, E. V., Zhukova, L. G., Kislov, N. V., Koroleva, I. A., Parokonnaya, A. A. et al. (2022). Practical recommendations for drug therapy of breast cancer. *Malignant Tumors: Practical Recommendations RUSSCO, 12*(#3s2), 155–197. (In Russ.).

Xia, Q., Kularatna, M., Virdun, C., Button, E., Close, E., & Carter, H. E. (2023). Preferences for palliative and end-of-life care: A systematic review of discrete choice experiments. *Value in Health, 26(12),* 1795–1809. https://doi.org/10.1016/j.jval.2023.07.005

Zinchenko, Yu. P., Rasskazova, E. I., Shilko, R. S., Kovyazina, M. S., Chernyaev, A. P., Varzar, S. M., Zheltonozhskaya, M. V., Lykova, E. N., & Rozanov, V. V. (2020). Efficiency of Radiation Therapy: A Study of Radiological and Psychological Risk Factors. *Science Intensive Technologies, 21(1)*, 50–62. https://doi.org/10.18127/j19998465-202001-08 (In Russ.).

Appendix 1

Scale of Satisfaction of Basic Psychological Needs—Autonomy, Competence, Relatedness—in the Context of Treatment

№	За время лечения я … [During treatment, I…]	Абсолютно не согласен [Strongly disagree]		В чем-то согласен, в чем-то нет [Partially agree]		Абсолютно согласен [Strongly agree]
1	Я чувствую, что у меня установились хорошие отношения, связь с медицинскими работниками [I feel that I have established good relationships and connection with healthcare providers]	1	2	3	4	5
2	Я часто чувствую себя одиноким [I often feel lonely]	1	2	3	4	5
3	Я чувствую эмоциональную связь и поддержку со стороны медицинских работников, которые со мной работают [I feel emotional connection and support from the medical professionals working with me]	1	2	3	4	5

№	За время лечения я … [During treatment, I…]	Абсолютно не согласен [Strongly disagree]		В чем-то согласен, в чем-то нет [Partially agree]		Абсолютно согласен [Strongly agree]
4	Я чувствую, что врачи или другие медицинские работники меня недооценивают или не понимают [I feel misunderstood or undervalued by doctors or other medical professionals]	1	2	3	4	5
5	Я чувствовал душевную близость с врачом или другими медицинскими работниками, которые со мной работают [I felt emotional closeness with the doctor or other medical professionals working with me]	1	2	3	4	5
6	У меня возникали разногласия или конфликты с людьми, которые участвуют в моем лечении или реабилитации [I have had disagreements or conflicts with people involved in my treatment or rehabilitation]	1	2	3	4	5
7	Я успешно выполняю трудные задачи, связанные с лечением и реабилитацией [I successfully complete difficult tasks related to my treatment and rehabilitation]	1	2	3	4	5
8	Я испытывал неудачи в лечении и реабилитации, НЕ мог успешно справиться с некоторыми моими делами [I experienced failures in treatment and rehabilitation and could not successfully manage some of my tasks]	1	2	3	4	5

№	За время лечения я … [During treatment, I…]	Абсолютно не согласен [Strongly disagree]		В чем-то согласен, в чем-то нет [Partially agree]		Абсолютно согласен [Strongly agree]
9	Я берусь за трудные задачи в реабилитации и справляюсь с ними [I take on difficult rehabilitation tasks and manage them successfully]	1	2	3	4	5
10	Стараясь восстановиться, я иногда чувствую себя некомпетентным, как будто у меня ничего не получается, как нужно [While trying to recover, I sometimes feel incompetent, as if nothing I do succeeds]	1	2	3	4	5
11	Я хорошо справляюсь даже с трудными задачами, связанными с лечением или реабилитацией [I handle even difficult tasks related to my treatment or rehabilitation]	1	2	3	4	5
12	Я испытываю трудности даже в тех задачах в лечении и реабилитации, с которыми вполне мог бы справиться [I experience difficulties even with tasks in treatment and rehabilitation that I could reasonably manage]	1	2	3	4	5
13	Я чувствую, что сам выбираю свои способы лечения, так, как я сам считаю нужным [I feel that I choose my treatment approaches as I see fit]	1	2	3	4	5

№	За время лечения я … [During treatment, I…]	Абсолютно не согласен [Strongly disagree]		В чем-то согласен, в чем-то нет [Partially agree]		Абсолютно согласен [Strongly agree]
14	Я испытываю много излишнего внешнего давления со стороны медицинских работников [I experience considerable external pressure from medical professionals]	1	2	3	4	5
15	Решения, которые я принимаю в отношении своего лечения, взвешенные и действительно МОИ собственные [The decisions I make regarding my treatment are well-considered and truly my own]	1	2	3	4	5
16	Люди вокруг меня все время говорят, что я должен делать для своего лечения [People around me constantly tell me what I should do for my treatment]	1	2	3	4	5
17	Я чувствую себя вовлеченным в процесс лечения, я активно участвую в нем, а не просто соглашаюсь на предложения врачей [I feel involved in the treatment process; I actively participate in it rather than simply accepting the doctors' suggestions]	1	2	3	4	5
18	Во время лечения я вынужден делать многие вещи против своего желания [During treatment, I am forced to do many things against my will]	1	2	3	4	5

Шкалы: «Автономия» (13–18), «Компетентность» (7–12), «Связанность» (1–6).
[Scales: Autonomy (Items 13–18), Competence (Items 7–12), Relatedness (Items 1–6)].

Received: May 14, 2025
Revised: August 10, 2025
Accepted: August 14, 2025

Author Contributions

All listed authors (Marina K. Karakurkchi, Aleksander Sh. Tkhostov, Elena I. Rasskazova, Sofia A. Kirsanova) contributed equally and comparably at all stages of the work—from formulating the research objectives and collecting the data to analyzing the results and writing the manuscript.

Author Details

Marina K. Karakurkchi, Medical Psychologist at Oncology Center No. 1, S.S. Yudin City Clinical Hospital; Postgraduate Student at the Department of Neuro- and Pathopsychology, Faculty of Psychology, Lomonosov Moscow State University, Moscow, Russian Federation; ORCID ID: https://orcid.org/0009-0007-6105-7798; e-mail: karakyrkchi_m@mail.ru

Aleksander Sh. Tkhostov, Dr. Sci. (Psychology), Professor at the Department of Neuro- and Pathopsychology, Faculty of Psychology, Lomonosov Moscow State University, Moscow, Russian Federation; Researcher ID: I-4782-2012; Scopus Author ID: 6603614962; ORCID ID: https://orcid.org/0000-0001-9676-4096; e-mail: tkhostov@gmail.com

Elena I. Rasskazova, Cand. Sci. (Psychology), Associate Professor at the Department of Neuro- and Pathopsychology, Faculty of Psychology, Lomonosov Moscow State University; Senior Researcher at the Mental Health Research Center, Moscow, Russian Federation; Researcher ID: I-6603-2012; Scopus Author ID: 8379943500; ORCID ID: https://orcid.org/0000-0002-9648-5238; e-mail: e.i.rasskazova@gmail.com

Sofia A. Kirsanova, Postgraduate Program Graduate, Faculty of Psychology, Lomonosov Moscow State University, Moscow, Russian Federation; ORCID ID: https://orcid.org/0009-0002-6993-4306; e-mail: sonyakirsanova@mail.ru

Conflict of Interest Information

The authors have no conflicts of interest to declare.