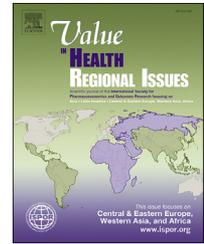




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Patient-Reported Outcomes

Factors That Predict Overall Patient Satisfaction With Oncology Hospital Care in Bulgaria

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ABSTRACT

Background: The relevance of studies focusing on patient satisfaction becomes imperative for patients with cancer, who often face major changes in their lifestyles. Their perceived uncertainty in illness and their personal experiences with the services received are crucial factors for a qualitatively adequate assistance. **Objectives:** To assess the determinants of patient satisfaction, using a sample of 306 Bulgarian oncology outpatients. **Methods:** The hypotheses tested concern the extent to which patient satisfaction depends on the uncertainty in illness; the patients' assessment of technical and interpersonal skills of nurses and medical staff; the information provision; and some organizational aspects. Patients were asked to answer a questionnaire composed of internationally validated scales assessing the determinants of patient satisfaction (measured through the European Organization for Research and Treatment of Cancer), uncertainty in illness (assessed through the Mishel Uncertainty in Illness Scale), and patients' health status (assessed through the EuroQol 5-dimensional questionnaire and the visual analogue scale). An ordered logit model

was run, using the level of overall patient satisfaction as a dependent variable. **Results:** This is one of the first studies carried out in Bulgaria for oncology patient satisfaction of subjective factors related to the frailty of the oncology patient status such as age, self-assessed health-related quality of life, and uncertainty in illness. Nevertheless, other determinants, reflecting the quality of the care provided, also have an impact on patient satisfaction, namely, the assessment of the nonmedical personnel, the perception of medical technical skills, and the access to a medical center. **Conclusions:** Results stress the relevance of reducing uncertainty in illness in patients with cancer by implementing a satisfactory patient-physician relationship in the management of the disease.

Keywords: Bulgaria, health technology assessment, HTA, oncology diseases, patient satisfaction

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Introduction

Any approach to care for chronic and long-term diseases should address the needs and requirements of the patients.^{1,2} In this perspective, social policy makers should develop programs aimed at improving patients' health conditions and, consequently, their satisfaction.³

The assessment of patients' satisfaction may help to draw guidelines and protocols, improving patients' assistance and support—a priority in all cancer-related services.⁴

Patient satisfaction is fundamental in the implementation of the customer satisfaction management model, which requires the involvement of citizens/users in programming, producing, and assessing a service.

Although this model regards patient satisfaction and the attention to patients' perspective as essential factors in determining the quality of the healthcare delivered, literature about oncology patients' satisfaction in Bulgaria is still limited.⁵

The present study aims at filling this gap. It proposes to evaluate the satisfaction of 306 Bulgarian oncology patients with regard to the assistance received by medical centers and investigate its determinants. It considers the impact on patient satisfaction of the patients' clinical conditions, their feelings of anxiety and depression, their personal experiences with the services received, and the impact of uncertainty in illness.

The article is organized as follows: the next 2 sections illustrate the framework of analysis, reporting the relevant literature and describing the Bulgarian institutional framework. The following 3

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sections present the tools used to build the data set, some descriptive statistics, and the regression model, respectively. A discussion of the results, together with some comments, concludes the article.

Theoretical Background and Hypothesis Setting

Patient Satisfaction With Care in Oncology

Health service researchers, healthcare providers, and regulators have acknowledged patient satisfaction as a constituent part—alongside clinical results, economic measures, and health-related quality of life—of the quality of the health service outcome.⁶ In particular, patient satisfaction has been considered a key patient-focused outcome to assess and enhance.⁷

Patient satisfaction is largely affected by the interpersonal facets of the process of healthcare delivery.⁸ This holds, a fortiori, in the case of oncology patients, who often face a prolonged care experience and become highly dependent on the healthcare system.⁹ For them, satisfaction becomes an important facet of general life satisfaction.

Oncology patient satisfaction is determined by the accessibility of care and the treatment environment, the technical aspects of care, the patient's education, the interpersonal aspects of care, the information offered by the medical personnel,¹⁰ the staff's sensitivity to the patient's condition and the personal difficulties linked to the oncology treatment, the staff's understanding of the patient's emotional needs, and the staff's capability of conveying information.⁷

The relevance of the information on quality perception conveyed to oncology patients is tackled by different contributions^{11–14} and is embedded in the questionnaires used to assess patient satisfaction.^{15,16}

This discussion leads to the following set of hypotheses related to patients' satisfaction with their treatments. This may depend on the following:

- HH1: technical and interpersonal skills of nurses and medical staff, respectively;
- HH2: information provided by nurses and medical staff, respectively;
- HH3: organizational aspects of care; and
- HH4: other personnel's evaluation.

The Oncological Experience and Uncertainty

Mishel defines uncertainty as “the inability to determine the meaning of illness-related events.”^{17,18} Uncertainty is a determinant of stress for people suffering from life-threatening illness and their caregivers.¹⁹ It promotes the onset of anxiety and depression,^{20,21} lowers compliance with medical treatments,²² and negatively affects patients' quality of life.²³

Uncertainty is a significant part of the oncology patients' experience, characterized by a complex care, requiring different professionals and providers.²⁴ Often, oncology patients are uncertain about the diagnosis and prognosis, do not understand the necessity and the importance of further diagnostic examinations, and are puzzled about the possible treatment choices.²⁵ The perception of the physician as a reliable source of information is paramount in the sense-building of the illness experience, because it reduces uncertainty.²⁶

From this discussion it follows that:

- HH5: oncology patient satisfaction with the treatment depends on different facets of uncertainty in illness.

The Framework of Analysis

Bulgaria had a population of 7,101,859 inhabitants in 2016. The Bulgarian population is aging, which is common in European Union (EU) member states. In fact, the percentage of people aged 65 years and older is constantly rising; it was 11.9% in 1980, 16.6% in 2000, 17.4% in 2009, and 20.7% in 2016.

Bulgaria still lags behind the EU averages in most mortality and morbidity indicators. The 3 main causes of death are circulatory diseases, respiratory diseases, and malignant neoplasms.

In 2013, the standardized death rate for malignant neoplasms in Bulgaria was 306.7 per 100 000 in males and 195.0 per 100 000 in females, whereas in EU these indices were 212 per 100 000 in males and 126 per 100 000 in females.²⁷ Cancer incidence is slightly lower than in other countries in southeastern Europe, although the trends are similar. Cancer incidence per 100 000 inhabitants rose from 285.1 in 1995 to 426.0 in 2008; in 2013, it was 557.6 per 100 000 in males and 458.8 per 100 000 in females.²⁷

There were 34 864 new cancer cases registered in 2011. The most common cancer in males was lung cancer (18.9% of all cancer cases in males), whereas breast cancer was the most common in females (27.3% of all cancer cases in females).²⁷

Oncology care in Bulgaria is almost always hospital care. Bulgarian healthcare is a mixed model system. All patients have to be hospitalized (an overnight stay) at least once per month. In addition, if the time between the chemotherapy cycles is less than a month, the second cycle is performed in outpatient settings. This means that practically all oncology patients are hospitalized for an overnight stay as well as treated in an outpatient setting, that is, for less than 12 hours of stay.

Diagnostics, procedures, infusions, and patients' long-term follow-up are performed in the same hospital setting. Oncological hospitals coexist with bigger hospitals, where the medical oncology department is just a single division among many others.

In Bulgaria, there is a relatively good access to innovative treatment, such as target therapy and immunotherapy.⁵ Nevertheless, despite the universal coverage, the scarcity of professionals involved in cancer care may have an impact on the quality of assistance provided to patients. It is estimated that about 40 medical oncology specialists are currently caring for all patients with cancer in the entire country.²⁸

The quality of medical care has always been one of the most substantial problems.²⁹ Sixty-eight percent of citizens evaluate the overall quality of healthcare as bad and 72% (the highest percentage in EU) think that the quality of healthcare in Bulgaria is worse than in the other EU member states.³⁰

Adequate allocation of public resources for cancer care is achievable through an integrated approach to the treatment, in which every step of the clinical path is part of an individual treatment plan for each patient, to be implemented and controlled in stages. In this perspective, it is necessary to introduce mechanisms for monitoring the treatment outcomes, relying on qualitative data as a starting point for improvement.³¹

Methods

Instruments

To assess the different dimensions of patients' disease experience, an ad hoc questionnaire has been developed. It includes internationally validated scales: the EuroQol 5-dimensional questionnaire (EQ-5D), the visual analogue scale (VAS), the European Organization for Research and Treatment of Cancer (EORTC), and the Mishel Uncertainty in Illness Scale (MUIS).

The EQ-5D measures the health-related quality of life,^{32,33} looking at 5 dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), each rated according to

its level of severity (1 = no problems, 2 = slight problems, 3 = moderate problems, 4 = severe problems, and 5 = extreme problems).

The VAS asks to assess the health status on a vertical scale with end points 0 (worst health) and 100 (best health).³⁴

The EORTC IN-PATSAT32¹⁵ is a 32-item questionnaire assessing patients' appraisal of hospital doctors and nurses, as well as specific organizational and structural aspects of the service delivery. It contains 11 multi-item and 3 single-item scales. Each item is rated on a 5-point Likert scale (5 = excellent, 4 = very good, 3 = good, 2 = fair, and 1 = poor). The multi-item scales assess the technical competence, information provision, interpersonal skills, and availability of physicians and nurses. They also evaluate the other hospital staff's interpersonal skills and information provision, waiting time, and access.

In our version, the multi-item scales measuring nurses' technical skills and nurses' availability, respectively, were reduced to single-item scales, because some items referring to the in-patient experience were dropped.

The 3 single-item scales concern the exchange of information, comfort, and overall satisfaction of care, respectively. Through this last item of the questionnaire it was possible to collect the relevant information about patient satisfaction to include in the regression analysis as the dependent variable.

In line with the EORTC items, an additional question was introduced to assess the degree of the patient's involvement in all the medical choices that have an impact on his or her own health.

The MUIS has often been used for oncology patients to assess the uncertainty associated with the course and the treatment of the disease.^{17,35–37} Subsequent re-elaborations of the original MUIS have led to a 4-factor structure encompassing 32 items and 4 dimensions that may condition patients' daily life and psychological well-being: ambiguity, complexity, inconsistency, and unpredictability.

Ambiguity consists of 13 items and addresses “the cues about the state of illness that are vague and indistinct and tend to blur and overlap.” Complexity consists of 7 items and takes into account “the cues about the treatment and the system of care that are multiple, intricate and varied.” Inconsistency contains 7 items and refers to the information received “that either changes frequently or is not in accord with information previously received.” Unpredictability consists of 5 items that relate to “the lack of contingency between illness and treatment cues and illness outcome.”^{17,18}

The items of the MUIS are rated on a 5-point Likert scale: 5 = strongly agree, 4 = agree, 3 = I don't know-undecided, 2 = disagree, and 1 = strongly disagree. The patient had to select the degree to which he or she agreed or disagreed with the statements or was undecided/did not know.

Data

Data were collected at 4 oncology private centers (Serdika Medical Centre, Nadejda Medical Centre, the University Hospital “Tsaritzia Yoanna”—ISUL, and Central Onco Hospital) that only perform chemotherapy on solid tumors. These centers assist about 5 000 patients every year.

Patients were recruited between June 2015 and December 2015. A total of 400 patients were consecutively approached, 306 of whom accepted to be interviewed during their hospital stay.

The average response rate was 76.5%, with slight differences among oncology centers: the Serdika Medical Centre response rate was 78% (167 patients approached; 131 respondents); the Nadejda Medical Centre response rate was 74% (65 patients approached; 48 respondents); the ISUL response rate was 77% (101 patients approached; 78 respondents); and the Central Onco Hospital response rate was 73% (67 patients approached; 49 respondents).

The interviewers were psychologists or physicians who had received a brief training. The objective of the study was clearly explained by the physicians.

The interview lasted between 0.5 and 1 hour. The interviewers answered the patients' doubts, gave explanations if required, and assisted them in case of need (if, eg, the patient was too tired to read carefully and answer the questions).

The Regression Model

The single item from the EORTC referring to the patient satisfaction with the service and the assistance received (“In general, how would you rate the care received during your hospital stay?”) was the dependent variable of an ordered logit regression.³⁸ This choice was motivated by the fact that patients' assessment was expressed on an ordered scale: patients ranked their level of satisfaction on a scale from 1 (poor) to 5 (excellent).

From the methodological point of view, this kind of response scale is superior to other types of response scales.³⁹ The score was then standardized on a 0 to 100 scale¹⁵—the higher the score, the higher the satisfaction.

In the ordered logit regression, the dependent ordinal variable Y is a linear function of another latent variable Y^* , continuous and not measured. This latent variable Y^* has a different threshold point: the probability of observing a given outcome corresponds to the probability that the estimated linear function, plus random error, is within the range of the cutoff points estimated for the outcome.

The explanatory variables were patients' demographic characteristics such as age, sex, primary education; other comorbid factors; the EQ-5D scores for movement, pain, and anxiety/depression; the MUIS scores for ambiguity, complexity, and unpredictability (the inconsistency score was not included because of its redundancy with other explanatory variables referring to the information provided by nurses and physicians taken from the EORTC IN-PATSAT32); some single- and multi-item scales from the EORTC questionnaire, aimed at outlining the assessment of physicians' and nurses' technical skills, interpersonal skills, and information provision, respectively; and the appraisal of the other personnel and organizational aspects such as waiting time, access, and comfort.

Results

Tables 1 and 2 present some descriptive statistics for the 306 patients interviewed. Forty-nine patients were from Central Onco Hospital, 78 were from ISUL, 48 were from Nadejda Medical Center, and 131 were from Serdika Medical Center. The number of each item as indicated in the original EORTC IN-PATSAT32 and MUIS questionnaires are also provided in parentheses.

Patients were, on average, 66 years old; 47% of them were women, 73% presented comorbidities, and 72.4% were graduates. On average, individuals had been diagnosed 11 months earlier (the disease onset ranged from 2 to 30 months); 55.2% of the patients received chemotherapy.

The VAS score describing patients' health status before disease onset was 82 of 100, whereas the VAS score assessing patients' health status at the time of the interview was about 43; 77.2% of the patients declared a worsening in their health conditions. Among the answers given to the EQ-5D, the highest score was reported for the pain dimension, which was, on average, the most deteriorated health dimension.

The average scores of uncertainty were as follows: 36.586 for ambiguity (range 17–56), 24.595 for inconsistency (range 11–35),

Table 1 – Descriptive statistics.

Variable	Mean \pm SD	Minimum	Maximum	No. of observations
Age	66.38 \pm 9.23	41	88	306
Time from disease onset (mo)	10.582 \pm 6.184	2	30	294
VAS	42.575 \pm 17.628	0	90	301
EQ-5D				
Movement	1.843 \pm 0.895	1	4	300
Care	1.560 \pm 0.754	1	4	300
Usual activities	2.196 \pm 1.104	1	4	301
Pain	1.674 \pm 0.895	1	4	301
Anxiety/depression	2.738 \pm 1.252	1	5	302
Health status before the diagnosis	81.792 \pm 16.988	30	100	294
Worse health status comparing with last year	0.772 \pm 0.420	0	1	303
Same health status comparing with last year	0.225 \pm 0.418	0	1	306
MUIS (original MUIS numbering in parentheses)				
Ambiguity (3, 4, 8, 13, 14, 16, 17, 19, 22, 23, 25)	36.586 \pm 6.014	17	56	304
Inconsistency (1, 2, 5, 11, 18, 21, 28)	24.595 \pm 3.113	11	35	302
Complexity (6, 7, 10, 27, 30, 31, 32)	19.285 \pm 4.000	8	27	304
Unpredictability (12, 20, 24, 26, 29)	15.760 \pm 2.309	6	22	302
EORTC questionnaire, standardized scores (original EORTC numbering in parentheses)				
General satisfaction (dependent variable) (32)	88.525 \pm 17.070	25	100	306
Physicians' technical skills (1, 2, 3)	85.961 \pm 10.376	58.33	100	209
Physicians' interpersonal skills (4, 5, 6)	80.242 \pm 11.553	50	100	301
Physicians' information provision (7, 8, 9)	79.725 \pm 11.510	58.33	100	302
Physicians' global assessment (1, 2, 3, 4, 5, 6, 7, 8, 9)	81.954 \pm 5.755	65.63	96.43	209
Nurses' technical skills (10)	89.618 \pm 12.340	75	100	301
Nurses' interpersonal skills (15, 16, 17)	91.845 \pm 6.413	75	100	302
Nurses' information provision (18, 19, 20)	86.805 \pm 8.897	58.33	100	300
Nurses' availability (22)	91.584 \pm 11.833	75	100	303
Exchange of information between physicians and nurses (23)	72.862 \pm 17.810	50	100	304
Other personnel's assessment (24, 25, 26)	81.972 \pm 12.032	50	100	302
Waiting time (27, 28)	84.109 \pm 12.530	50	100	303
Access (29, 30)	88.317 \pm 12.575	50	100	300
Comfort (31)	93.033 \pm 11.227	50	100	305
Patients' feeling of participation (item added)	66.095 \pm 28.707	25	100	306
EORTC single items (original EORTC numbering in parentheses)				
Physicians' experiences of the disease (1)	4.595 \pm 0.666	2	5	299
Physicians' knowledge of the therapy (2)	4.671 \pm 0.584	2	5	301
Physicians' care about patients' physical problems (3)	4.053 \pm 0.850	3	5	299
Physicians' availability to listen to patients' needs (4)	4.020 \pm 0.931	3	5	301
Physicians' interest in patients' well-being (5)	4.089 \pm 0.852	2	5	302
Physicians' support given to patients (6)	4.515 \pm 0.501	4	5	301
Information given about the disease by physicians (7)	3.798 \pm 1.082	2	5	302
Information given about medical tests by physicians (8)	4.102 \pm 0.772	3	5	303
Information given about the therapy by physicians (9)	4.653 \pm 0.554	2	5	303
Nurses' technical skills (interest in patients' well-being) (14)	4.585 \pm 0.493	4	5	301
Nurses' interest toward patients (15)	4.516 \pm 0.614	3	5	302
Nurses' support given to patients (16)	4.753 \pm 0.432	4	5	304
Nurses' human skills (17)	4.747 \pm 0.435	4	5	305
Information about medical tests (18)	4.431 \pm 0.749	3	5	306
Information about the treatment (19)	4.710 \pm 0.454	4	5	300
Information about the therapy (20)	4.287 \pm 0.803	3	5	306
Nurses' availability (time dedicated to patients) (22)	4.663 \pm 0.473	4	5	303
Exchange of information between nurses and physicians (23)	3.914 \pm 0.712	3	5	304
Other personnel's kindness (24)	4.255 \pm 0.761	3	5	305
Information provided at admission (25)	4.205 \pm 0.826	3	5	302
Information provided at discharge (26)	4.374 \pm 0.715	3	5	305
Waiting time for the medical test results (27)	4.142 \pm 0.791	3	5	303
Waiting time for undergoing medical tests (28)	4.582 \pm 0.494	4	5	306
Access to the hospital/medical center building (29)	4.793 \pm 0.406	4	5	300
Access within the hospital/medical center (30)	4.292 \pm 0.872	2	5	305
Cleaning, comfort of the medical center (31)	4.721 \pm 0.449	4	5	305

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Table 1 – continued

Variable	Mean ± SD	Minimum	Maximum	No. of observations
General satisfaction (32)	4.541 ± 0.683	2	5	305
Patient's feeling of participation (item added)	3.644 ± 1.148	2	5	306

EORTC indicates European Organization for Research and Treatment of Cancer; EQ-5D, EuroQol 5-dimensional questionnaire; MUIS, Mishel Uncertainty in Illness Scale; VAS, visual analogue scale.

19.285 for complexity (range 8-27), and 15.760 for unpredictability (range 6-22).

With regard to the EORTC IN-PATSAT32, patients attributed a high score (88.52) to their overall satisfaction. They rated the information provided by physicians as 79.72 and that by nurses as 86.8, with the same range (58.33-100) applying to both. The assessment of the nurses was higher than the assessment of the physicians and the other personnel. Apart from the patient's feeling of participation, the item with the lower score was the exchange of information between physicians and nurses.

Organizational aspects such as waiting time, access, and comfort received high scores too.

Table 3 presents the results of the regression analysis.

Overall, the estimated coefficients and the regression itself showed a satisfactory level of significance.

To better interpret these results, it is useful to remember that in a logit model the coefficients of the independent variables are the natural logarithms of the odds of the dependent variable,⁴⁰ where the odds are defined as the ratio of the probability of success (in this case an increase in the patient satisfaction score) and the probability of failure. A positive coefficient means that a unit increase in the predictor is associated with increased odds for a higher category in the dependent variable, all other variables being constant; conversely, a negative coefficient is associated with decreased odds for a higher category. It is then possible to convert the coefficient of the logit regression into probabilities. (It is first necessary to obtain the odds by calculating the e-function of the coefficient and then apply the following formula: probability = odds/[1 + odds].) This transformation allows one to identify which predictors of overall satisfaction are the strongest in Bulgaria.

In what follows, for all the explanatory variables showing a significant correlation with the dependent variable, the estimated coefficient and its corresponding probability value will be provided in parentheses.

Among the control variables, age is significant and positively correlated with patient satisfaction (logit = 0.805; $P=.691$). This is in line with the extant literature on patient satisfaction.^{41–43}

Table 2 – Percentages of dichotomous variables.

Variable	Percentage	No. of observations
Sex (female = 1; male = 0)		306
Female	46.7	143
Male	53.3	163
Education (1 = yes; 0 = otherwise)		294
Primary	0.3	9
High school	24.5	72
Graduate	56.1	165
Postgraduate	16.3	48
Comorbid factors (1 = yes; 0 = otherwise)	72.9	306
Pharmacological treatment (1 = yes; 0 = otherwise)	55.2	306

Comorbidities have a negative impact on the level of satisfaction (logit = -1.613 ; $P=.167$): this may signify that, with many comorbidities, patients' conditions are more demanding and so the level of assistance received may be considered insufficient. Furthermore, an inverse and significant relationship can be observed between the dependent variable and the circumstance to report a worse health compared with the previous year (logit = -1.200 ; $P=.231$). These results are consistent with the existing evidence on the oncology patients' unmet needs, which increase as the disease advances.⁴⁴

The estimated coefficients of 3 EQ-5D dimensions (movement, pain, and anxiety/depression) are significant. Movement is inversely correlated (logit = -1.485 ; $P=.185$), indicating that the more difficult it is to move for the patient, the lower is the judgment given to the assistance received, whereas pain (logit = 0.625; $P=.651$) and anxiety/depression (logit = 0.588; $P=.643$) are positively related.

Table 3 – Ordered logit model results.

Dependent variable: overall patient satisfaction	Coefficient	Standard error
Age	0.805*	0.036
Sex	0.521	0.385
Other comorbid factors	-1.613^*	0.691
Worse health comparing with the last year	-1.200^\dagger	0.446
European Quality of Life Scale (EuroQol)		
Movement	-1.485^\ddagger	0.420
Care	-0.120	0.462
Usual activities	0.177	0.339
Pain	0.625 [†]	0.250
Anxiety/depression	0.588 [†]	0.151
Mishel Uncertainty in Illness Scale		
Ambiguity	-0.135^*	0.068
Complexity	0.308 [†]	0.066
Unpredictability	0.272 [†]	0.104
Physicians' technical skills	-0.059^\ddagger	0.018
Physicians' interpersonal skills	0.024 [‡]	0.012
Physicians' information provision	0.010	0.016
Nurses' technical skills	0.025 [‡]	0.014
Nurses' interpersonal skills	0.041	0.032
Nurses' information provision	-0.008	0.023
Other personnel's assessment	0.067 [†]	0.019
Waiting time	0.012	0.017
Access	0.026*	0.013
Comfort	0.010	0.020
Cut 1	16.150	7.101
Cut 2	18.830	6.936
Cut 3	21.263	6.961

* Significant at 90%.
[†] Significant at 95%.
[‡] Significant at 99%.

As for hypothesis HH1, results suggest that the technical skills of doctors are inversely and significantly correlated with the dependent variable (logit = -0.059 ; $P=.485$); the variable related to nurses' technical skills is positively correlated, although weakly significant; interpersonal skills are positively correlated for both physicians and nurses, although this relation is not significant for nurses and is weakly significant for physicians.

With respect to hypothesis HH2, results suggest that the variable related to the information provided by doctors has a positive, although not significant, correlation; conversely, the variable related to the information provided by nurses is not significant and the sign of the correlation is not the expected one.

In terms of the impact of the aspects of care organization on patient satisfaction (hypothesis HH3), waiting time and comfort are positively correlated but not significant. Only access is significant and positively correlated (logit = -0.026 ; $P=.507$), and hence the easier the access to the medical center, the higher the satisfaction.

With reference to hypothesis HH4, the estimated coefficient relative to the assessment of the other personnel is significant and positively correlated to patient satisfaction (logit = -0.067 ; $P=.517$).

As far as uncertainty in illness and its dimensions are concerned (hypothesis HH5), ambiguity shows an inverse, although not significant, relationship with patient satisfaction, whereas complexity (logit = 0.308 ; $P=.577$) and unpredictability (logit = 0.272 ; $P=.568$) are positively and significantly correlated.

These results highlight that the variables that have a high impact on overall oncology patient satisfaction in Bulgaria are those related to the frailty of the oncology patient status: age, complexity, unpredictability, pain, and anxiety/depression. Nevertheless, other explanatory variables, reflecting the quality of the care provided, also have a high impact on patient satisfaction: the assessment of the nonmedical personnel and the perception of medical technical skills and access to the medical center.

Discussion

The present research was aimed at outlining some possible factors that have an impact on oncology patients' satisfaction. It is to be framed within the literature considering patient satisfaction as a measure of the quality of the healthcare provided, which must be monitored and examined to improve the providers' performance. The study enriches the limited evidence on oncology patient satisfaction in Bulgaria.

Some valuable aspects of the article are summarized as follows. First, the assessment of 306 oncology patients' satisfaction with the assistance received appears to be quite high (88.525 on a 0–100 range) compared with the international evidence.¹⁵

Second, the regression analysis outlined the relevance for oncology patient satisfaction of subjective factors, different aspects of uncertainty in illness, specific aspects of self-assessed health-related quality of life, the appraisal of professional competence, and organizational factors.

In particular, the results pertaining to the variables used as controls mainly confirm the findings of the existing literature. The results also show that the less healthy the patients who suffer from comorbidities and report a worsening in their health are, the lower is their satisfaction.¹⁴ As suggested by the existing literature, oncology patients tend to have various unmet needs, which increase as the disease advances.^{14,44}

In terms of the evidence coming from the EQ-5D, the inverse correlation between patient satisfaction and the dimension of movement is in line with the literature, suggesting that the greater the functional impairment is, the lower is the satisfaction with care.^{45–48}

Conversely, the positive relationships found between the dependent variable and the dimensions of pain and anxiety/depression seem to be inconsistent with the literature.^{49,50} This calls for further investigation, although it could be explained by the patient's need to rely on the assistance provided by the oncological centers to reduce the immanent physical and/or psychological suffering.

In line with the relevant literature, technical and professional skills of physicians and nurses concur to define the assessment of overall patient satisfaction.⁷

One seemingly odd result is the inverse and significant correlation between patient satisfaction and the medical technical skills. This could be explained by the information asymmetry, which may be higher in elderly patients and makes it difficult for them to assess this factor.

In line with the aforementioned reasoning, physician interpersonal skills are positively correlated, although weakly significant, with patient satisfaction. The patient-physician relationship encompasses not only communication; a patient whose health condition is likely to deteriorate irreparably attributes a high value to being seen as a person by the physician, with whom he or she can discuss his or her fears and establish a mutual relationship of respect and trust.⁵¹

The variable related to nurses' technical skills, although weakly significant, is positively correlated with patient satisfaction. Although nurses' interpersonal skills are not significant, the positive and significant impact of the overall assessment of the other members of staff on patient satisfaction can be explained by the consideration that a quality care also entails monitoring patients and allowing an early recognition of their deterioration. If problems are identified, the patient may benefit from a rapid appropriate interdisciplinary team response to the patient.⁵²

The inverse correlation of ambiguity, although not significant, and the positive and significant correlation of complexity and unpredictability with patient satisfaction, which seem counter-intuitive, may be explained as follows.

Complexity and unpredictability might not be perceived as being caused by a bad communication system. They are, rather, the results of the characteristics of the illness itself. Complexity arises when the treatment management or the healthcare system itself is difficult to understand; conversely, unpredictability occurs when the patient's present illness experience is not congruent with previous illness experiences.

Therefore, their positive correlation with patient satisfaction may signify that the more challenging and uncertain the illness state is per se, the higher is the extent to which patients need to rely on the cancer center and, consequently, the higher is the assessment of the service received.

The suggestion to be drawn from this contribution is that the healthcare professionals who are actively engaged in quality efforts should try to embrace the patient's perspective, involving him or her in the treatment to obtain a bilateral understanding of the illness experience and better planning of the treatment.

This way, the medical decisions still based on the best evidence-based therapeutic guidelines available would respect patient values and expectations.⁵³

The main limitation of our analysis lies in its cross-sectional nature: our results may suggest only a casual pattern that needs to be confirmed by a longitudinal study following a cohort of patients. This should assess the changes in the perception of satisfaction related to changes in the patients' personal conditions, the development of the illness, and changes in the hospital service delivery aspects (both organizational and interpersonal) that could be implemented during the period at study to meet patients' needs.

This program could be a strong opportunity for patients to coproduce hospital service together with medical personnel, and

to use their personal illness experience to obtain a better health outcome.

The oncology patient would be put at the center of the therapy, as suggested in the World Summit Against Cancer of 2000 in article VII of the Charter of Paris.⁵⁴

Conclusions

Our results, although in line with the international literature, could be extended within the same territory of Bulgaria to both a larger sample of oncology patients and other patients experiencing other chronic diseases. This latter possible extension of the present study could allow one to understand whether, when not speaking of cancer (still associated with fear and death), different aspects of uncertainty in illness may have a different impact on patient satisfaction. The patients need to be aware of their own health conditions, in the presence of incongruences between their previous and present illness experiences (unpredictability) as well as their quest for simplicity and clarity of treatment (complexity), which may in fact vary according to the chronic disease considered, resulting in a different impact on patient satisfaction.

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