

ORIGINAL ARTICLE

Assessment of oncology patients' satisfaction from intravenous chemotherapy

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Summary

Purpose: To assess patient satisfaction from chemotherapy and investigate the effect of demographic factors, disease symptoms and treatment on satisfaction.

Methods: A non-randomized cross-sectional survey was conducted on a sample of 100 patients undergoing chemotherapy at "Metaxa" Cancer Hospital, Piraeus, Greece for 6 months. A demographic data questionnaire, a Cancer Treatment Satisfaction Questionnaire (CTSQ) and visual analog scales were used to evaluate pain, anxiety, fatigue, and nausea while presence or absence of vomit were also assessed.

Results: The majority of the patients in the sample were men (51%), with a mean age of 58.5 ± 10.82 years. The mean value of expectations from treatment was 60.55, from treat-

ment's satisfaction was 75.86 and from feelings about treatment's side effects was 44.56. The most serious symptoms were fatigue and anxiety (7.2 ± 1.95 and 6.71 ± 2.5 , respectively). Statistical tests have shown that sub-dimensions of CTSQ are associated with pain, anxiety, fatigue, and nausea.

Conclusions: Generally, chemotherapy meets patients' expectations with cancer. Symptoms such as fatigue, anxiety, pain, and nausea affect their satisfaction. Treatment's satisfaction can be improved by evaluating symptoms, which will lead to appropriate interventions.

Key words: chemotherapy, cancer, treatment's satisfaction, treatment expectations, feelings about side effects

Introduction

The last decades, a significant improvement was seen in the survival of cancer patients due to early diagnosis and improvement in treatment options. Chemotherapy is considered one of the main methods of treating malignant neoplasms which increases survival, provided mainly in outpatient clinics. Despite the improvement of supportive care, chemotherapy is accompanied by serious side effects [1-3].

Symptoms such as nausea, vomiting, diarrhea, pain, fatigue and anxiety often occur and adversely affect the functional status and patients' quality of life (QoL) [4-6]. The increased incidence of side

effects due to the variety of combination of chemotherapeutic drugs and therapies often leads to further burden on patients and to costly hospitalizations. In addition, relevant studies have shown that the effectiveness of various interventions for the treatment of pain, fatigue and psychological stress was not obvious [5,7,8]. Therefore, prevention and timely management of symptoms are vital for improving patient satisfaction [6]. Even more, in diseases with poor prognosis (such as advanced lung cancer), where chemotherapy is associated with limited improvement of survival and an increased risk of side effects, the awareness of expectations

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and patients' satisfaction is highly important [9,10]. The toxicity of chemotherapy is now considered as an important outcome factor in studies and clinical practice [9,11]. Patient's satisfaction from treatment and care is generally a key element in evaluating health care in oncology. It provides valuable information to health professionals about the impact of cancer and treatment-related side effects [12,13] focusing to the prevention or the effective management of side-effects, in order to improve QoL [14,15]. It is closely linked to decision making, conformance to treatment and highlights the patient's experience. Additionally, the estimation of patient's satisfaction from treatment and care is a mean of recording patients' expectations and preferences regarding the occurrence and management of side effects, the choice and the type of treatment and its effectiveness [9].

Satisfaction from chemotherapy is important to be assessed using appropriate tools in various interventions, such as in daily clinical practice, in research, during service evaluation and when study changes to improve health services [9,16-18].

The purpose of the present study was to postulate patients' satisfaction from chemotherapy, and to investigate the effect of demographic factors and the most common disease symptoms and treatment on satisfaction.

Methods

Prospective convenience sampling was performed in a sample of 100 patients who visited the Ambulatory Care Unit at "Metaxa" Cancer Hospital, Piraeus, Greece. The time required for the data selection was 6 months (from 11/2017 to 5/2018). Criteria selection for the patients' participation in the study were to be diagnosed with cancer regardless of stage, have reached adulthood and have received at least two cycles of intravenous chemotherapy. Patients who did not speak and understand the Greek language and patients diagnosed with a severely disorder of emotion, thought and perception, were excluded. Patients participated in the study only once, regardless of the number of hospital visits.

Data selection

A demographic and clinical questionnaire was used for data collection, as well as the following questionnaires: Cancer Treatment Satisfaction Questionnaire – CTSQ [19] which evaluates patients' satisfaction from chemotherapy. It consists of three dimensions which evaluate the expectations from the treatment (5 questions), the feelings about the side effects (4 questions) and the cancer patients' satisfaction from the treatment (7 questions), regardless of the type, the stage of cancer and the type of chemotherapy given. Each question is rated from one to five, with the lowest value representing the worst answer. Four questions are reversed, while the score of each dimension is calculated by the formula:

(average score of dimensions -1) x 25. The result of the score of each dimension ranges from 0 to 100, with the highest score representing more positive results [20]. The internal consistency of the CTSQ questionnaire was checked using Cronbach's a coefficient, which was 0.750 for the first subscale, 0.735 for the second and 0.812 for the third. A limit value of Cronbach's a coefficient of 0.70 was chosen, which indicates sufficient reliability for research purposes. Visual Analogue Scale (VAS) was used to assess the most common symptoms, such as pain, anxiety, fatigue, and nausea, in a straight line of 10 cm, for each one. The intensity was estimated by measuring the distance of the patient's point from the lower end of the scale in millimeters, with the recommended limits being: 0–4 mm (no intensity), 5–44 mm - (mild intensity), 45–74 mm (moderate intensity) and 75–100 mm - (very high intensity) [21]. Finally, the presence or absence of vomiting was assessed. The presence or absence of vomit were also assessed.

Statistics

The categorical variables were expressed as absolute (N) and relative (%) frequencies, while the continuous variables were expressed as mean and standard deviation. Kolmogorov-Smirnov test and Shapiro-Wilk test were used to control normal distribution of the data. The comparison of the categorical demographic variables in relation to the dependent satisfaction indices was performed using the t-test for the independent samples (Independent samples t-test) or the ANOVA model, while the correlation of demographic variables with the dependent indices was done with the Pearson correlation coefficient. The correlation of the dependent indicators with the demographic variables was studied using the model of multiple regression analysis with the method of entering all the variables simultaneously (enter method). All demographic variables that had a p value <0.25 in the one-dimensional analysis participated in the multidimensional analysis.

For the use of the above models, the conditions of their application were checked, such as the normal distribution of the residuals, their almost constant variation, the measurements' statistical independence (Durbin-Watson Test) and finally the appearance of no collinearity between the independent variables. All statistical analyses were performed with the SPSS statistical package, version 17.00 (SPSS Inc, Chicago, IL). All controls were two-sided. P value <0.05 was defined as the level of a statistically significant difference.

Ethical approval

The present research study complied with the fundamental principles of ethics, which are included in the conduct of any research. The study was approved by the Hospital's Committee of Ethics and Research (21/30-10-10-14/71). Subsequently, the patients received the relevant information and were given the necessary clarifications regarding the purpose of the study, anonymity, confidentiality, voluntary participation, the possibility of withdrawal from the study at any time and the usefulness of the expected results. Finally, all patients signed the informed consent form to participate in the study.

Table 1. Demographic characteristics of the patients in the study (n=100)

	n (%)
Sex	
Male	51 (51.0)
Female	49 (49.0)
Educational level	
Elementary school	35 (35.0)
High school	45 (45.0)
University	20 (20.0)
Arrival at the hospital	
Public transports	3 (3.0)
Private vehicle	88 (88.0)
Taxi	9 (9.0)
Work	
No	88 (88.0)
Yes	12 (12.0)
Awareness of diagnosis	
No	13 (13.0)
Yes	87 (87.0)
Hospitalized in the past	
No	32 (32.0)
Yes	68 (68.0)
Age	
Mean value ± standard deviation	58,50 ± 10,82 (min 29, max=91)

Results

Of the 132 patients who met the participation criteria, 100 responded (76% response rate). The reasons for their refusal to participate in the research were the indifference, the fear of changing health professionals' behavior towards them and the lack of time to complete the questionnaire. In addition, some patients expressed anger due to their negative psychology. One more reason was that a percentage of them were unaware of the diagnosis, so relatives prevented any conversation.

The majority of participants were men (51%), had a mean age of 58.5 ± 10.82 years, were high school graduates (45%) and came to the hospital in a private vehicle (car) at a percentage of 88%. Among them 12% were unaware of the diagnosis of the disease, 68% had previously been treated for the present disease and 12% were continuing normally to work (Table 1). In Table 2 listed are the mean values of the three subscales of CTSQ questionnaire and the symptoms studied. Specifically for CTSQ and the dimension "Expectations from treatment" the average value was 60.55, exceeding the average of the values' range of the scale, while for the dimension "Emotions about side effects" was 44.56, below the average of the values' range of the scale. Finally, the average value of the dimension "Satisfaction from chemotherapy"

Table 2. Descriptive characteristics of the dimensions of CTSQ questionnaire and patients' symptoms

	Average	Median	Standard deviation	min	max
Expectations from chemotherapy	60.55	55.00	20.83	20.00	100.00
Emotions about side effects	44.56	40.63	15.91	18.75	75.00
Satisfaction from chemotherapy	75.86	76.79	16.74	35.71	100.00
Pain ^a	3.05	2.00	3.33	0.00	10.00
Stress ^a	6.71	8.00	2.50	0.00	10.00
Fatigue ^a	7.17	8.00	1.95	0.00	10.00
Nausea ^a	3.45	3.00	2.87	0.00	10.00
Vomit ^b	1.68	2.00	0.47	1.00	2.00

^aMin value=0, Max=10; ^a1=presence of vomiting and ^b= absence of vomiting

Table 3. Correlations between CTSQ and patients' symptoms

	Expectations from chemotherapy	Emotions about side effects	Satisfaction from chemotherapy
Age	-0.170	0.116	-0.086
Pain	-0.385**	-0.339**	-0.245*
Stress	-0.329**	-0.432**	-0.391**
Fatigue	-0.486**	-0.376**	-0.391**
Nausea	-0.384**	0.064	-0.218*
Vomit	-0.065	-0.136	0.035

*p<0.05, **p<0.005

was 75.86, approaching the maximum values of the scale. Concerning the symptoms (Table 2), the mean values of the pain scale were 3.05 ± 3.33 (min=0, max=10), of nausea 3.45 ± 2.87 (min=0, max=10) and of vomit 1.68 ± 0.47 [min = 1 (yes), max = 2 (no)]. The mean values of anxiety were 6.71 ± 2.50 (min=0, max=10) and fatigue $7.20. 1.95$ (min=0, max=10) respectively.

Examining the correlations between questionnaire's dimensions, a negative correlation seems to be in almost all CTSQ's subcategories with pain, anxiety, fatigue and nausea.

The highest correlation is appeared to be between "Expectations from chemotherapy" and fatigue ($r = -0.486$, $p < 0.0005$). It did not seem to exist a statistically significant correlation between vomiting and age with all subcategories of CTSQ (Table 3).

In Table 4 presented are the results of one factor analysis for the three dimensions of the scale. Specifically, for the dimension "Expectations from chemotherapy" there was a statistically significant difference between people who do not work and those who work (mean= 58.64 ± 19.95 and 74.58 ± 22.61 respectively, $p = 0.012$), as well as among people who have not been treated in the past, compared to those who have been treated (mean= 70.00 ± 20.95 and 56.10 ± 19.37 respectively, $p = 0.002$). Regarding the dimensions "Feelings about

side effects" and "Satisfaction from chemotherapy", no statistically significant difference was observed for any of the patients' factors.

Multiple regression analysis showed that only fatigue had a significant effect ($p = 0.003$) for the dimension "Expectations from chemotherapy", with the factors of the model interpreting 37.1% ($R^2 = 0.371$, $p < 0.001$) of variation of the variable control. A one unit increase in fatigue decreased the "Expectations from treatment" index by 3.3 units (Table 5). For the dimension "Emotions about side effects" it seemed that the factors of the model interpret 27.5% ($R^2 = 0.275$, $p < 0.001$) of the variance's variable control and by pain ($p = 0.031$) and stress ($p = 0.003$) had a statistically significant effect.

An increase in pain by one unit decreased the emotion index respectively the same (1 unit) on side effects, while an increase in stress index by one unit decreased the emotion index by 2.24 units on side effects, too (Table 5). Multiple regression analysis for the dimension "Satisfaction from chemotherapy" showed that the model's factors interpret 20.3% ($R^2 = 0.203$, $p < 0.001$) of the variance of the dependent variable and the stress factor had a statistically significant effect in the variable satisfaction from the treatment ($p = 0.001$). An increase of one unit in the stress index decreased the treatment satisfaction index by 2.37 units (Table 5).

Table 4. One factor analysis between CTSQ's scale dimensions and patients' factors

	<i>Expectations from chemotherapy</i>		<i>Emotions about side effects</i>		<i>Satisfaction from chemotherapy</i>	
	<i>Mean±SD</i>	<i>p value</i>	<i>Mean±SD</i>	<i>p value</i>	<i>Mean±SD</i>	<i>p value</i>
Sex		0.620		0.105		0.518
Male	61.57±20.43		42.03±14.79		74.79±16.18	
Female	59.49±21.39		47.19±16.73		76.97±17.41	
Educational level		0.433		0.149		0.331
Elementary School	64.00±23.03		48.75±17.00		75.41±19.40	
High School	57.89±18.63		41.94±14.33		74.05±14.29	
University	60.50±21.64		43.13±16.59		80.71±16.77	
Arrival at the Hospital		0.076		0.117		0.118
Private vehicle	61.31±20.36		45.53±15.57		76.26±16.75	
Taxi	48.33±23.45		36.81±17.52		67.06±15.65	
Work		0.012		0.946		0.130
No	58.64±19.95		44.60±15.61		74.92±16.69	
Yes	74.58±22.61		44.27±18.74		82.74±16.18	
Awareness of diagnosis		0.276		0.120		0.287
No	68.08±26.42		50.96±17.83		80.49±16.08	
Yes	59.43±19.80		43.61±15.49		75.16±16.82	
Hospitalized in the past		0.002		0.512		0.231
No	70.00±20.95		46.09±15.21		78.79±13.64	
Yes	56.10±19.37		43.84±16.29		74.47±17.95	

Table 5. Multiple regression analysis

	Reference category	B	Standard deviation	p value
Age	-	-0.22	0.19	0.243
Arrival at the hospital (Public Transports -Taxi)	Private Vehicle	-0.83	5.48	0.880
Work (Yes)	No	4.75	6.22	0.447
Have you been hospitalized in the past? (Yes)	No	-6.91	3.89	0.079
Pain	-	-1.17	0.60	0.054
Fatigue	-	-3.29	1.00	0.001
Nausea	-	-1.14	0.69	0.100
<i>For the index "Emotion about side effects"</i>				
	Reference category	B	Standard deviation	p value
Sex	Male	5.58	2.85	0.053
Educational Level (High School-University)	Elementary School	-2.42	3.65	0.508
Arrival at the hospital (Private Vehicle)	PublicTransports	-3.33	4.43	0.453
Do you know about your illness?	No	-2.98	4.43	0.503
Pain	-	-0.99	0.45	0.031
Stress	-	-2.24	0.61	0.003
<i>For the index "Satisfaction from chemotherapy"</i>				
	Reference category	B	Standard deviation	p value
Arrival at the Hospital (Private vehicle)	Public Transports	1.61	4.92	0.744
Work (Yes)	No	6.40	4.91	0.195
Have you been hospitalized in the past?	No	-1.80	3.47	0.605
Pain	-	-0.37	0.53	0.489
Stress	-	-2.37	0.66	0.001
Nausea	-	-0.65	0.60	0.289

Discussion

The present study investigated three factors of patients' satisfaction from chemotherapy, which are treatment's expectations, feelings about side effects, and treatment's satisfaction. These compose the subscales of the satisfaction concept [22-25] in a convenience sample of patients visiting "Metaxa" Cancer Hospital. The study results showed that patients' expectations from treatment exceeded the average of the values range of the scale (60.55), while patients' satisfaction approached the highest value (75.30). These findings reveal that even though patients report negative feelings about therapy side effects they accept them as well.

Despite the progress of addressing oncology patients, the assessment of treatment's satisfaction has not been adequately studied. The literature is limited, focusing more on QoL estimations and other various dimensions, such as burnout, burden and strain [11,14,17,26].

Investigating the demographic characteristics of the participants, it was found that women scored higher than men in the subcategory of feelings about side effects. This is confirmed also by other

studies, which report that women perceive and deal more dynamically with threatening health conditions, compared to men who are more demanding and easier complaining at the onset of the first symptoms of disease [27,28]. The great degree of their discomfort may be explained by the characteristics of the disease, the age at diagnosis, the functional limitations, and the reduced sexual activity.

Cancer is incompatible with dominant's masculinity ideals and, therefore, poses a threat to male identity. Strong social beliefs about stoicism, self-confidence and self-control may lead to more adverse effects from cancer and a higher incidence of depressive symptoms [29]. On the other hand cancer-related addiction, vulnerability and lack of control can undermine masculinity, but not femininity [30].

According to the present study, patients appeared to be quite satisfied by the treatment and their expectations were confirmed, a finding which is consistent with other similar studies [31-33]. This is probably due to their belief that health professionals are skilled and fully committed to their work because their lives literally depend on them [32,34].

The factor “feelings from the side effects” was scored close to the mean of the scale values, a fact that is observed, also in other studies [19,20,22]. This effect probably reinforces the hypothesis that patients experience a negative emotional state each time they experience side effects from treatment, which can greatly affect all aspects of behavior as well as patients’ perceptions of events.

Not surprisingly, stress and fatigue had the highest score among the symptoms studied. These symptoms are often reported during chemotherapy and often can bring about or amplify one to another [35]. According to Clarke et al (2015) [36], fatigue is considered one of the most common symptoms in cancer patients and can affect QoL, as well as their functional and emotional status.

Significant correlations were recorded for all subscales with pain, anxiety, fatigue, nausea, and vomiting. Fatigue, pain and stress were also found to be independent negative risk factors for all three subscales (expectations from chemotherapy, feelings about side effects, and satisfaction from chemotherapy) of the CTSQ questionnaire. The severity of these symptoms creates a complex that has a direct effect on patient’s functionality and QoL [37]. Previous studies have shown that the effects on QoL depend on patient’s physical and mental condition, the stage of disease, the type of cancer, the organ being affected, the family, the personal attitude towards the disease and the way in which side effects will be addressed [38,39]. The evaluation and management of existing symptoms is an important parameter of the overall treatment of disease for each oncology patient from the time of diagnosis to cure or death [37,40,41]. Still, the application of less acceptable interventions may be preferred in some cases, if more favorable results or lower levels of toxicity are expected [42].

According to the results, the factor “expectation from chemotherapy” is influenced to some extent by the means of transport to and from the hospital, in order to administer chemotherapy. More specifically, patients transported by a relative or a friend by a private vehicle had greater satisfaction in this particular parameter of expectations. It seems that support in practical issues such as transportation

to and from the hospital is very important for the psychological support of the patient, in order to counteract more effectively the cancer [37]. Positive effect of work on the dimensions of satisfaction was also seen. The support that the work environment is able to provide can prevent psychological collapse and deterioration [35]. Finally, the previous hospitalizations have led to more negative expectations regarding treatment, which is probably due to psychological despair and fatigue from the constant effort of dealing with serious health problems [35].

Limitations of the study

Despite the important findings, the study has some limitations. The results of the present study cannot be generalized for all oncology patients receiving chemotherapy due to the small sample size from a single hospital. Additionally, in the present study, the effect of some factors, such as the type and stage of cancer, as well as the chemotherapy cycle, were not evaluated. For these reasons, future studies will be needed, taking into account all the above factors.

Conclusions

It seems that chemotherapy given to cancer patients responds positively to their expectations and they are generally satisfied from it. However, feelings about chemotherapy are rather negative, but women are more emotionally “strong” than men.

From the symptoms studied, fatigue and stress seem to have a greater impact on patients’ satisfaction from treatment and consequently on their QoL.

Patients’ expectations, feelings, and satisfaction can be improved by nursing interventions that focus on evaluating, informing, educating, and supporting patients and their families. Factors that should always be taken into account are gender, age, educational level and family environment, in order to personalize the interventions.

Conflict of interests

The authors declare no conflict of interests.

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