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ORIGINAL ARTICLE

Satisfaction survey of Greek inpatients with brain cancer

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Summary

Purpose: *To investigate brain cancer patients' satisfaction hospitalised in a tertiary care university public hospital in Alexandroupolis, Greece, in order to improve medical, nursing, and organizational-administrative services.*

Methods: *This cross-sectional study involved 163 patients having been hospitalised for at least 24 hours. The patients were asked to fill in a satisfaction questionnaire previously approved by the Greek Ministry of Health. Four aspects of satisfaction were investigated (medical, hotel accommodation/organisational facilities, nursing, global). Using Principal Component Analysis, summated scales were formed and tested for internal consistency using Cronbach's alpha coefficient. The non parametric Spearman's rank correlation coefficient was also used and the threshold p-value for statistical significance (2-sided) was set at 0.05.*

Results: *The results revealed a high degree of global satisfaction (73.31%), yet satisfaction was higher for the medical (88.88%) and nursing (84.26%) services. Moreover, satisfaction derived from the accommodation facilities and the general organisation was found to be more limited (74.17%). Statistically significant differences (based on various demographic variables) in the participants' global satisfaction were not observed. On the contrary, self-assessment of health status at admission was negatively correlated with medical (r_s=–0.157, p=0.045) and nursing (r_s=–0.168, p=0.032) satisfaction. Greek citizenship contributed to bigger satisfaction scores in the accommodation/organisational facilities dimension (r_s=0.158, p=0.044). Finally, age was positively linked to nursing satisfaction (r_s=0.181, p=0.02).*

Conclusion: *The present study confirmed in part the results of previously published Greek surveys assessing general patient populations. However, more studies are urgently needed to confirm these findings in a much bigger brain cancer population.*

Key words: brain cancer, patient satisfaction, quality, questionnaire

Introduction

In general, evaluation of patients' satisfaction based on structured questionnaires is considered to be an essential prerequisite in order to assess the quality of health care services [1]. Quality could be defined as the dynamic and continuous improvement of health care focusing on appropriateness, availability, continuity, effectiveness, efficacy, efficiency, respect, safety, and timeliness [2-4].

Yet, the notion of quality is not identical to that of satisfaction [5]. Quality refers to the customers'-users' perception over a period of time, while satisfaction is related to specific moments of service [6]. Satisfaction depends also on the price of the service, and on the degree of difficulty of obtaining this service [7]. The role of users' expectations (predicted, desired, and adequate service) is of crucial importance too [8].

The consequences of a cancer diagnosis are far-reaching and complex, affecting not only the patient but his/her network of caregivers as well [9]. Among the malignant entities, brain cancer is considered unique in that the organ affected is traditionally viewed as the seat of an individual's literal sense of identity [10]. It is, thus, of major importance to assess the quality of medical services provided in this specific population [11].

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The scope of the present study was to measure the level of inpatients' satisfaction (diagnosed with brain cancer) for medical, nursing, organization and hotel services in the University General Hospital of Alexandroupolis, Greece, in order to investigate the level of quality services provided in this specific hospital.

Methods

Questionnaire administered

A well structured satisfaction questionnaire approved by the Greek Ministry of Health and previously validated in Greek patients was employed [10]. The final questionnaire included 36 questions, which followed in chronological order the steps from the time the patient was admitted to hospital until discharge [12]. The questionnaire included 5 domains: admission (3 items), medical services (4 items), nursing services (4 items), accommodation services (6 items), administration services (2 items). The questionnaire also contained sociodemographic variables (13 items), including age, gender, educational level, professional status, and marital status. Finally, all respondents were asked about their global satisfaction and their perceived health level on the day of admission and discharge (in a scale of 0-10). The main questions linked directly to satisfaction are presented in Table 1.

Responses to closed-end questions were given in a 5-grade Likert scale (very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied: 5 denoting maximum satisfaction and 1 minimum, 0 stands for "I don't know/I don't answer"). Likert scales formed a comprehensible structure followed easily by both patients and researchers [13].

Table 1. Questions included in the administered questionnaire on which satisfaction was measured

Question	*Description of question*
Q17	Emergency department services (physicians)
Q18	Professional efficiency - diagnosis, therapy (physicians)
Q19	Information and instructions provision (physicians)
Q20	Behavior, human relationships (physicians)
Q21	Professional efficiency, responsiveness, care (nurses)
Q22	Behavior, human relationships (nurses)
Q24	Professional efficiency (nurses paid by patients)
Q25	Cleanliness of wards, hospital
Q26	Toilet cleanliness
Q27	Organization - noise, visiting hours
Q28	Food - breakfast, lunch, dinner
Q29	Behavior (food distributing personnel)
Q30	Ability to communicate - television, telephone, salon
Q31	Processing of medical needs - schedule, further examinations
Q32	Administration - admission, payments, secretary
Q33	Global satisfaction

Study population

The study was conducted among brain cancer patients admitted to the University General Hospital of Alexandroupolis, Thrace, Greece, a tertiary care centre with 673 beds founded in 1939. No such study was ever reported in the region of Thrace. All patients who had remained in the hospital for at least 24 hours were eligible for inclusion. Patients with dementia or psychosis (proven by medications prescribed) were excluded. All study participants signed a consent form. The study was in compliance with the Helsinki Declaration and the Research Committee of the hospital gave approval to the study.

Data collection

A total of 194 patients who had been discharged between January 2005 and February 2009 was contacted on the day of discharge. The selected patients were given the satisfaction questionnaire and asked to complete it on the spot without any interference from the researchers. A cover letter was also given explaining the reasons for conducting the survey, encouraging their participation, and guaranteeing data confidentiality. The average completion time was 9 min and the obtained response rate was 84.02% (163 patients). The rest of the patients (15.98%) refused to cooperate due to the large number of questions and their bad psychological condition. The method of telephone or mail survey was ruled out, since Greece has no tradition in such surveys and the expected response rate would be too small [10].

Statistical analysis

The scoring scale for each domain was standardized between 0 and 100, with a score of 100 indicating the highest level of satisfaction. The same standardization was performed for global satisfaction (Question33 - Q33), satisfaction from nursing services (computed by merging Q21 and Q22) and two other dimensions constructed with the aid of Principal Component Analysis (PCA) [14], namely satisfaction from medical services and satisfaction from accommodation/administration.

The Kaiser-Meyer-Olkin measure of sampling adequacy gave a value of 0.798 (values > 0.7 are consid-

ered satisfactory) [15]. Data were analysed with the PCA method and rotated with the Varimax system (Kaizer normalization), taking into account the internal consistency reliability [14]. PCA is a factor extraction method used to form uncorrelated linear combinations of the observed variables. The first component has maximum variance. Successive components explain progressively smaller portions of the variance and are all uncorrelated with each other [16]. A Q in order to become a part of a summated scale had to present a correlation limit > 0.5 [17]. In addition, the differences in correlation coefficients of each Q with different components (factor loadings) should be > 0.20 [18]. The internal consistency reliability investigates if all Q of a summated scale measure the same construct. It is measured by Cronbach's alpha coefficient. Values > 0.70 demonstrated that all Q do belong to the same construct [19]. If this coefficient was < 0.70, then one or more Q were removed [14].

For exploring the possible correlation of the 4 aforementioned scales with various sociodemographic variables (age, gender, location, insurance provider, education, marital status, citizenship, prior readmissions), and self-perceived health status (both at admission and discharge), Spearman rank correlation coefficient was utilized.

Descriptive statistics were calculated for the sociodemographic variables. In the univariate analysis, the relationships among these variables, prior admissions, and survey completion logistics variables with the 4 satisfaction scales were studied. Moreover, Student's t-test, analysis of variance (ANOVA), and Kruskal-Wallis test were utilized for continuous variables, and the chi-square test or Fisher's exact probability test for categorical variables. The threshold p-value for statistical significance (2-sided) was set at 0.05. Statistical analysis was performed by Statistical Package for Social Sciences (SPSS v. 16.0).

Results

Patient characteristics

The mean age of the participants was 58.9 years; 53.4% were men, 73.0% married, 51.5% came from the city of Alexandroupolis, 36.2% had private sector employees insurance provider (IKA), 33.7% had a university degree, and 44.2% had never been hospitalised in this hospital before. The self-perceived level of health was rated with ≤ 5 points by 100 respondents (61.3%) on admission and by 41 participants (25.2%) on discharge.

Principal component analysis (PCA)

Two components were found which constructed two summated (multi-item) scales. The first component (C1) explained 73.110% of total variance and the second (C2) explained 10.369% (83.479% in total). Table 2 presents the correlations between Q and components. Q22 and Q29 gave similar factor loadings and were excluded from further analysis. Q17-21 (satisfaction mainly from medical staff) seemed to relate to C2 with a Cronbach's coefficient of 0.829. Removal of Q17 increased the coefficient's value to 0.947 (Table 3). On the other hand, Q24-28 and Q30-32 (satisfaction from accommodation and administration) seemed to relate to C1 with a Cron-

Table 2. Rotated component matrix

	Component	
	1	*2*
Q17	0.008	0.871
Q18	0.444	0.874
Q19	0.444	0.874
Q20	0.495	0.767
Q21	0.506	0.793
Q22	0.588	0.685
Q24	0.599	0.128
Q25	0.779	0.454
Q26	0.914	0.294
Q27	0.861	0.436
Q28	0.872	0.392
Q29	0.674	0.593
Q30	0.890	0.285
Q31	0.802	0.392
Q32	0.890	0.285

Extraction method: Principal component analysis; Rotation method: Varimax with Kaiser normalization

Table 3. Cronbach's alpha for medical services

	Scale mean if item deleted	*Scale variance if item deleted*	*Corrected item-Total correlation*	*Cronbach's alpha if item deleted*
Q17	18.24	5.088	0.271	0.947
Q18	17.92	4.666	0.863	0.737
Q19	17.85	4.958	0.728	0.772
Q20	17.86	4.975	0.792	0.761
Q21	18.03	4.571	0.800	0.746

bach's coefficient of 0.949. By removing Q24, internal consistency improved (coefficient=0.966; Table 4).

The responses in Q18-21, Q24-28, Q30-32 (but not Q17 and Q24,) of the two multi-item scales were grouped and two new summated scales were constructed; satisfaction from accommodation/administration and medical services. The corresponding descriptives are shown in Table 5.

One could notice that mean satisfaction from medical services (88.880±1.103) was larger in comparison with satisfaction computed for accommodation/administration (74.167±1.423). The first one also presented larger minimum values (50 vs. 17.86%). Mean satisfaction from nursing services was slightly smaller as compared to the physician one (84.259±1.265). The global satisfaction was even lower (73.313±1.494).

In Table 6 the mean values of the 4 scales of satisfaction for some demographic variables is provided. Females, Greek citizens, patients in the 19-35 age group, and those with elementary education and with only one prior admission presented the best scores. The biggest reported mean medical satisfaction score was also found in married subjects living in semi-urban areas. Divorced and patients working in the public sector reported the biggest satisfaction score with respect to the nursing services. High satisfaction derived from accommodation/administration and global satisfaction was found mainly in poor unmarried brain cancer patients living in other than Alexandroupolis urban centers.

Correlations of four summated scales with sociodemographic variables

No variable was found to relate to Q33 (global satisfaction). Age was related only to the nursing satisfaction (r_s=0.181, p=0.021) (older patients were more satisfied). Citizenship related only to accommodation/administration satisfaction (r_s=0.158, p=0.044) (Greeks more satisfied). Self-perceived health status related to medical (r_s=–0.157, p=0.045) and nursing (r_s=–0.168, p=0.032) satisfaction on admission (patients with better self-perceived health were more dissatisfied). No such correlation was found for medical (r_s=–0.060, p=0.446) and nursing satisfaction (r_s=–0.056, p=0.483) on discharge. Finally, gender, location, insurance provider, level of education, marital status, and number of prior admissions did not seem to relate to any satisfaction scales. The corresponding r_s and p values are presented in Table 7. It is worth noticing that all p-values did not reach statistical significance.

Discussion

The majority of the variables presented in this paper have been previously studied in other Greek satisfaction surveys [10,20]. However, to our knowledge, there is no published study implementing all these variables, and by no means is there a report of hospitalised brain

Table 4. Cronbach's alpha for accommodation-administration

	Scale mean if item deleted	*Scale variance if item deleted*	*Corrected item-Total correlation*	*Cronbach's alpha if item deleted*
Q24	28.50	19.364	0.539	0.966
Q25	27.17	19.424	0.846	0.941
Q26	27.25	19.295	0.950	0.936
Q27	27.42	15.538	0.949	0.937
Q28	27.42	18.083	0.926	0.935
Q30	27.33	20.061	0.893	0.941
Q31	27.50	19.000	0.858	0.940
Q32	27.33	20.061	0.893	0.941

Table 5. Descriptives (Scale 0-100)

	N	*Minimum*	*Maximum*	*Mean*		*SD*	*Variance*
	Statistic	*Statistic*	*Statistic*	*Statistic*	*SE*	*Statistic*	*Statistic*
Global satisfaction	163	0.00	100.00	73.313	1.494	19.070	363.648
Medical services satisfaction	163	50.00	100.00	88.880	1.103	14.079	198.218
Accommodation-administrative services satisfaction	163	17.86	100.00	74.167	1.423	18.161	329.833
Nursing services satisfaction	162	62.50	100.00	84.259	1.265	16.101	259.231
Valid N (listwise)	162						

SE: standard error, SD: standard deviation

Table 6. Mean values of 4 scales of satisfaction for 8 demographic variables (mean/standard deviation)

	Medical		*Accommodation - administration*		*Nursing*		*Global*	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Age (years)								
0-18	83.4	13.1	71.0	12.1	76.1	14.1	73.9	9.2
19-35	86.8	13.5	73.7	18.7	81.6	13.2	75.0	20.1
36-50	95.2	10.9	77.2	18.0	92.0	12.0	75.0	19.1
51-65	88.7	15.5	76.1	18.9	85.1	18.7	72.8	21.6
66+	85.6	16.0	69.0	17.5	78.8	19.4	67.3	15.8
p-value	0.008		0.553		0.001		0.698	
Gender								
Male	87.3	15.2	72.3	19.0	81.8	17.7	71.6	20.2
Female	90.9	12.4	77.0	15.7	87.2	13.6	76.0	16.7
p-value	0.122		0.168		0.032		0.208	
Location								
Alexandroupolis	88.8	15.2	72.7	18.4	83.3	16.2	71.4	19.8
Other urban	90.6	11.8	79.1	16.3	87.2	15.1	78.4	17.5
Semi-urban	91.7	12.3	76.5	18.5	90.6	12.1	77.1	19.8
Rural	84.9	14.8	71.1	16.0	78.4	18.2	70.5	14.7
p-value	0.470		0.199		0.087		0.217	
Insurance provider								
Public sector employees	90.6	13.3	74.1	18.6	86.6	15.1	72.5	18.6
Private sector employees (IKA)	89.7	14.0	75.8	17.5	85.4	14.0	75.8	19.1
Farmers' insurance	82.9	16.2	68.5	17.5	78.8	18.2	66.3	19.4
Craftsmen - Small traders	77.5	18.0	60.0	17.6	75.0	17.7	60.0	22.4
Poor	92.9	9.1	79.6	15.4	82.1	22.7	78.6	17.3
Uninsured	91.0	12.5	77.4	16.5	83.3	20.7	77.8	15.0
Other	91.1	12.9	79.3	16.1	86.2	16.6	77.6	16.4
p-value	0.159		0.329		0.448		0.250	
Education								
Uneducated	78.1	4.4	66.1	12.6	75.0	0.0	75.0	0.0
Elementary (6 years)	90.8	13.7	80.5	16.0	89.2	14.1	78.3	12.9
Secondary School (3 years)	87.7	15.1	72.8	18.3	80.1	17.9	71.9	20.8
High School (3 years)	88.9	14.0	74.2	17.0	85.1	14.9	74.1	17.5
University	89.7	14.0	74.5	18.7	84.8	16.8	72.7	20.6
p-value	0.734		0.534		0.353		0.748	
Marital status								
Married	89.5	14.1	73.9	19.2	85.0	16.4	72.9	20.0
Unmarried	87.7	13.3	75.4	12.5	81.3	14.8	77.2	11.3
Widowed	87.5	17.7	75.0	0.0	81.3	8.8	75.0	0.0
Divorced	87.5	18.9	73.2	25.8	87.5	18.9	68,8	25,9
p-value	0.927		0.974		0.618		0.552	
Citizenship								
Other	85.3	14.6	68.3	15.3	81.6	18.8	72.1	15.0
Greek	89.4	14.0	75.2	17.8	84.6	15.8	73.8	19.2
p-value	0.268		0.158		0.476		0.775	
Prior admissions								
0	86.7	14.5	72.8	13.9	81.3	17.0	73.3	14.1
1	95.5	9.0	84.2	21.9	92.0	10.5	83.9	23.2
2	92.0	11.8	76.3	15.7	87.2	12.3	75.0	17.2
3	84.4	18.0	67.5	24.4	83.8	16.7	62.5	21.2
4+	88.9	15.5	74.1	22.6	84.3	19.2	71.3	25.7
p-value	0.079		0.051		0.134		0.024	

p-values according to Analysis of Variance (ANOVA), Student's t-test, and Kruskal-Wallis test; SD: standard deviation

Table 7. Spearman's correlation for 6 demographic variables and the 4 satisfaction scales [r_s (p)]

	Medical satisfaction	*Accommodation-administration*	*Nursing satisfaction*	*Global satisfaction*
Gender	0.092 (0.187)	0.127 (0.107)	0.142 (0.072)	0.090 (0.251)
Location	– 0.045 (0.569)	0.028 (0.719)	0.015 (0.854)	0.024 (0.759)
Insurance	– 0.067 (0.396)	– 0.026 (0.741)	– 0.068 (0.387)	– 0.012 (0.877)
Education	0.047 (0.551)	0.009 (0.906)	0.046 (0.564)	– 0.007 (0.927)
Marital status	– 0.050 (0.529)	– 0.017 (0.831)	– 0.079 (0.316)	0.043 (0.583)
Prior admissions	0.082 (0.298)	0.073 (0.351)	0.117 (0.139)	– 0.015 (0.846)

cancer patients' satisfaction investigation in the region of Thrace, Greece. The questionnaire completion after hospitalisation seems to limit positive bias, since patients are no longer "hostages" of the hospital system [21].

Our data suggest that the 4 dimensions of satisfaction were affected by age, citizenship, and self-perceived level of health on admission. In our patients global satisfaction was found to be 73.31% similar to other Greek studies carried out in a general patient population; in 2005, Polyzos et al. reported a rate of 3.98 (in a scale 0-5) [22]. No variable was statistically related to this dimension. Other researchers linked older age and lower education with high satisfaction [10,23,24]. However, satisfaction in patients aged >80 years seems to decline [25]. In contrast to our findings, it has been documented that women [26] and married patients [27] are more satisfied with hospital care. However, in 2006 Quintana et al. reported higher levels of satisfaction in men and in the single/divorced subgroup [28].

Satisfaction from medical services was 88.88% (in other Greek hospitals ranged from 80.4 to 92.8% [10,20, 22] and satisfaction from nursing services was 84.259% (in other Greek hospitals ranged from 52.4 to 90.0%) [10,20,22]. Both of these dimensions were correlated with poor self-perceived health status on admission. Interestingly, patients with prior admissions were not found to be more demanding, as published research states [28], in which the bigger the number of prior admissions, the bigger the satisfaction scores. In addition, other studies linked good self-perceived health status on admission to a higher satisfaction score [23,29]. It should be stressed that patients generally give bigger rates to physicians, since they do not fully understand their services, and that the lack of nursing personnel plays a crucial role in acquired responses [30].

The accommodation/administrative dimension was graded with 74.17%. Surveys conducted in Greece reported a satisfaction rate for administrative services ranging from 75 to 96.2% [20,22], while Niakas et al. reported a satisfaction score for accommodation services of 75.9% [10]. No association between length of stay or number of prior admissions and satisfaction on domains such as cleanliness was found, even though this is frequently the case in many international studies [23,28].

Certain limitations of this study should be underlined. Firstly, Q18 and Q21 (professional efficiency of physicians and nurses) could be problematic since patients rarely possess the necessary knowledge to judge on this matter. Secondly, all questions were considered as ratio scales. However, other researchers treat them as ordinal data [31] or even as interval scales [32]. Thirdly, the investigation of patient satisfaction is a dynamic and evolving process which demands not only the participation of large number of patients from different hospitals at various points in time, but also the management of lack of sensitivity of questionnaires to changes in patients' satisfaction as well [10,24,33]. Finally, it has been documented that satisfied patients tend to answer more often [34].

Similar studies in American and European countries highlight the importance of health personnel participation in educational activities such as seminars and postgraduate courses [35]. Of major importance seems to be the adoption of a patient-centred communication, a notion incorporating patient understanding through his/her own values and special psychosocial environment [36,37].

In conclusion, our results were in line with similar Greek studies, demonstrating a uniformity in patients' responses throughout the Greek territory, even though our sample was limited to patients diagnosed with brain cancer [10,20,22,38,39]. The Neurology and Neurosurgery Departments of University General Hospital of Alexandroupolis with its high quality infrastructures have the potential to play a central role in the health sector of Northern Greece. To this end, a continuous pursuit of excellence in health care quality provision is imperative.

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