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An ordered logit analysis of inpatient and outpatient satisfaction in a Turkish state hospital

Ali Kemal Çelik[1]
Department of Business Administration,
Faculty of Economics and Administrative Sciences,
Atatürk University, Erzurum, Turkey

Erkan Oktay[2]
Department of Econometrics,
Faculty of Economics and Administrative Sciences,
Atatürk University, Erzurum, Turkey

Ahmet İlker Akbaba[3]
Department of Business Administration,
Faculty of Economics and Administrative Sciences,
Erzurum Technical University, Erzurum, Turkey

Abstract

This study is an attempt to identify and better understand the key drivers of inpatient and outpatient satisfaction through an empirical analysis. A cross-sectional survey was administered among five hundred and eleven adult patients who had received care at various units of a Turkish state hospital. An ordered logit approach was used to analyze the underlying data due to the natural ordering responses of patients' satisfaction levels. The estimation results revealed that re-visit intention, general cleanliness of the hospital, trust to physician and other caregivers' courtesy had significant impact on patient satisfaction. Moreover, level of education, gender, current residence and type of patient were other influential drivers of satisfaction. This paper aims to contribute to the existing literature by modelling the inpatient and outpatient satisfaction predictors in a relatively least-developed region of Turkey, where little work was done. The results of this study may propose a road map for both the current region and the relevant least developed territories as a means of providing improved health care services.

Keywords: *Inpatient, Outpatient, Satisfaction, Hospital, Ordered Logit Analysis, Turkey*

Türkiye'deki bir devlet hastanesinde yatarak ve ayakta tedavi hizmeti alan hastaların memnuniyetlerinin sıralı logit model ile analizi

Özet

Bu çalışmada, bir devlet hastanesinde yatarak ve ayakta tedavi sağlık hizmeti alan 511 hastanın memnuniyet düzeyini etkileyen anahtar faktörlerin belirlenmesi amaçlanmaktadır. Çalışmada kullanılan bağımsız değişkenin sıralı kategorik bir yapıya sahip olması nedeniyle, elde edilen veriler sıralı logit yaklaşımı ile analiz edilmiştir. Tahmin sonuçlarına göre, hasta memnuniyetine etki eden faktörlerin tekrar ziyaret isteği, hastanenin genel temizlik düzeyi, hekime olan güven ve diğer sağlık personelinin hastalara yaklaşımı olduğu tespit edilmiştir. Bununla birlikte, eğitim düzeyi, cinsiyet, mevcut ikametgah ve hastanın aldığı sağlık hizmeti gibi bağımsız değişkenler, hasta memnuniyetine etki eden demografik faktörler olarak göze çarpmaktadır. Bu çalışma, Türkiye'nin göreli olarak daha az gelişmiş bir bölgesinde yer alan bir hastanenin hizmet kalitesini ortaya koyma açısından mevcut literature katkıda bulunmayı amaçlamaktadır.

[1] *akemal.celik@atauni.edu.tr (A.K. Çelik)*

[2] *erkanoktay@atauni.edu.tr (E. Oktay)*

[3] *aakbaba@erzurum.edu.tr (A.İ. Akbaba)*

Araştırma sonuçların hem mevcut bölge hem de diğer az gelişmiş bölgeler açısından yol gösterici olacağı düşünülmektedir.

Anahtar Kelimeler: *Yatan hasta, Ayakta tedavi, Memnuniyet, Hastane, Sıralı Logit Analizi, Türkiye*

1. Introduction

Despite some criticisms about its measurement and reliability [1-6], patient satisfaction is adopted to best describe the subjective experience of patients with health care because respect for patients' needs and wishes is central to any humane health care system, where the perceived needs must be considered both from the perspective of mental health professionals and the user's perspective [7-9]. In this manner, analyzing patient satisfaction associated with health care services, identifying the key drivers of patient satisfaction and improving health care service quality increasingly become essential for hospital operation [10].

Patient satisfaction is prominent in the literature on the role of caregivers and particularly their attitudes, courtesy or behaviors towards patients. Leiter, Harvie and Frizzell [11] pointed out the relationship between nurse burnout and patient satisfaction and they suggested that patients on units where nurses found their work meaningful were more satisfied with their hospital stay. Sun et al. [12] put forward the complaints of patients including assistance, explanation, and waiting time problems in five urban teaching hospital emergency departments. Jackson, Chamberlin and Kroenke [13] made an assessment on patient satisfaction with respect to immediate post-visit versus 2-week/3-month visit. Demir and Celik [14] exhibited that satisfaction with physician and physician were two of the major determinants of overall satisfaction with a Turkish military teaching hospital. Jenkinson et al. [15] indicated that physical comfort, emotional support, and respect for patient preferences were the major determinants of patient satisfaction. Pakdil and Harwood [16] founded that patients' most highly ranked expectation is adequate information and the second one is adequate friendliness courtesy. Chang, Yang and Chiang [17], Bikker and Thompson [18], Campbell, Auerbach and Kiesler [19] also highlighted interpersonal skills as an influential factor on patient satisfaction. Along similar lines, the results of Brown et al. [20] 's comprehensive survey underlined four significant predictors such as waiting time, courtesy of nursing staff and physicians and thoroughness of the physicians. Andaleeb, Siddiqui and Khandakar [21] underlined the significant impact of physicians' service orientation on the inpatient satisfaction in Bangladesh. Koermer and Kilbane [22] revealed that courtesy expressions and personal connection socialites played a significant role in overall satisfaction with the physician. O'Brien and Stewart [23] illustrated the abilities of nursing staff to provide patient satisfaction feedback to medical social workers. Torres, Vasquez-Parraga and Barra [24] concentrated on the impact of physician reputation that may explain patient loyalty, trust and satisfaction in a large city of South America. Consequently, they confirmed that physician reputation positively influences both patient trust and satisfaction. Oluwadiya et al. [25] suggested that time to surgical intervention, showing genuine concern by health workers, attitudes of nurses, and courtesy by health workers were the significant items with the highest priority for change in a Nigerian university teaching hospital. Johannessen et al. [26] indicated the patient overall satisfaction and nursing care in Norway. Otani et al. [27] also found significant contributions of individual patient attribute reactions, hospital-level effects and cross-level interactions on patient satisfaction using a hierarchical linear modelling approach. Tateke, Woldie and Ololo [28] demonstrated that several determinants of outpatient satisfaction at public and private hospitals in Ethiopia were self-judged health status, expectation about the services, perceived adequacy of consultation duration, perceived providers' technical competency, perceived welcoming approach and perceived body signaling. Campos Andrade et al. [29] investigated the mediating role of perceived quality of physical and social environment on

inpatient and outpatient satisfaction and the results showed that the objective environmental quality affects satisfaction through perceptions of environmental quality. Chahal and Mehta [30] defined the patient satisfaction as a multidimensional construct comprised of physical maintenance, physician care, nursing care and internal facilities dimensions with respect to their analysis results. Chang and Chang [10] explored the service quality of dental care and they noticed several key drivers of patient satisfaction in terms of attributes categorization. Quaschning, Körner and Wirtz [31] used a structural equation modelling approach to analyze the effects of shared decision-making, empathy and team interaction on patient satisfaction. They exhibited that team interaction should be considered as an important predictor of patient-centered outcome characteristics.

Many recent studies have also focused on the role of demographic variables on patient satisfaction. Sargeant and Kaehler [32] showed that patients from fundholding surgeries are more satisfied than patients from non-fundholding surgeries for almost every aspect of general practitioner services in the UK. Boudreaux et al. [33] found that patients' perceptions of care most consistently predicted satisfaction than demographic characteristics. However, Rahmqvist [34], Sun, Adams and Burstin [7], Carlin, Gudjonsson and Yates [9] indicated that greater age predicted higher satisfaction. Scotti and Stinerock [35] suggested that increased levels of trust is positively associated with overall satisfaction of elderly inpatients. Similarly, Nguyen Thi et al. [8] also highlighted older age as a strong predictor of inpatient satisfaction along with better self-perceived health status at admission, while Choi et al. [36] reported the impacts of age and gender factors on patient satisfaction. Kaldenberg [37] examined the relationship between health status and patient satisfaction and suggested that patient satisfaction did not appear to be influenced by the health of the patient when discharged. Xiao and Barber [38] showed that patient satisfaction was more associated with being older, married, better educated and having higher income, health insurance and good mental health. Frank, Sudo and Enkawa [39] revealed that aggregate income had a positive impact and economic expectations had a negative impact on patient satisfaction. Hekkert et al. [40] founded that age, health status, and education were the most important determinants of patient satisfaction, whereas, gender, mother language, and population density were the less important determinants. Rahmqvist and Bara [41] put forward younger patients in emergency care were the least satisfied group, while older patients with excellent health status were the most satisfied group. Additionally, patients with perceived better health status and those with less education were more satisfied than those with more education or poorer health status. Ashrafun and Uddin [42] suggested that inpatients' monthly family income and levels of education had significant effects on patient satisfaction. Qu et al. [43] revealed that older, less educated and low-income patients were tended to have higher satisfaction. Al-Borie and Sheikh Damanhouri [44] indicated that gender, education, income and occupation were statistically significant in influencing inpatient satisfaction. In Laal's [45] cross-sectional study, inpatient satisfaction showed a significant relation to age, gender, level of education, marital status, job, personal recommendation about care, family members, place of residing.

A number of studies have assessed patient satisfaction in terms of hospital efficiency and health service quality. Taner and Antony [46] indicated that inpatients in the private hospitals were more satisfied with service quality than those in the public hospitals. Baalbaki et al. [47] put forward that patient perceptions were significantly affected by hospital support functions. In Elleuch's [48] study, process quality attributes were found to be patient satisfaction antecedents in Japanese healthcare service quality. Kim et al. [49] suggested that medical services quality is shown partially to precede the value of care, and it is shown to have a significant influence on patient satisfaction and re-visit intention. Miranda et al. [50] found significant associations between the service quality dimensions and patient satisfaction in Spain. Botje, Klazinga and Wagner [51] suggested that a mixture of reforms and national guidelines increased the emphasis on quality

governance in Dutch hospitals. Cavalieri, Gitto and Guccio [52] showed that hospitals operating in regions where prospective payments are used more extensively and generally associated with better quality of healthcare. Cheng, Tseng and Woodside [53] demonstrated that patient satisfaction, patient participation in the process of diagnosis and patient participation in treatment decision-making were sufficient for high patient loyalty to the hospital. Gok and Sezen [54] indicated that hospital efficiency changes the form of the relationship between structural quality and patient satisfaction as a moderator variable.

This paper proposes to examine the key factors affecting inpatient and outpatient satisfaction in a Turkish state hospital. The rest of this paper proceeds as follows. Section 2 introduces the methodology and the sample of the present study. Section 3 presents the estimation results and the interpretation of them. Section 4 deals with the specification of the model being fitted. This study concludes with the discussion of the analysis results.

2. Methods

2.1. Ordered Logit Model

Researchers in the social sciences find themselves in many instances where the appropriate variable for analysis requires coding for some qualitative outcome. Such models are known as qualitative choice models. In such situations, the dependent variable takes a discrete number of mutually exclusive and collectively exhaustive values [55]. Similarly, there are also some occasions when the scale of a multiple category outcome is ordinal in a natural way such as extent of disease (none, some, severe), job performance (inadequate, satisfactory, outstanding), and opinion on some issue (strongly disagree, disagree, agree, strongly agree), where ordered logit or probit models are introduced to analyze them [56].

Let the *k* ordered categories of the response have probabilities $\pi_1(x), \pi_2(x), \ldots \pi_k(x)$ when the covariates have the value *x*, *Y* the response which takes values in the range 1, … , *k* with the underlying probabilities, and $K_j(x)$ be the odds that $Y \leq j$ given the covariate values. In this sense, the proportional odds model states that

$$K_j(x) = K_j \exp(-\beta^T x) \ (1 \leq j \leq k)$$

where β is a vector of unknown parameters. Furthermore, the ratio of corresponding odds

$$K_j(x_1)/K_j(x_2) = \exp\{\beta^T(x_2 - x_1)\} \ (1 \leq j \leq k)$$

is independent of *j* and depends only on the difference between the covariate values $x_2 - x_1$ [57]. The proportional odds model is also known as ordered logit model and this feature explains the parallel lines assumption of the ordinal models. When this assumption is invalid, the slope coefficients associated with a particular variable will be different across different outcomes and then the method of ordered logit model will be no longer appropriate [55]. The model is linear in the logistic scale, so when $l_j(x_i)$ denotes the cumulative logits of $Y \leq j$ versus $Y > j$, it can be defined as

$$l_j(x_i) = \log\left[\frac{\Pr(Y \leq j | x_i}{\Pr(Y > j \ | x_i}\right]$$

For each of the *J* values of the ordered response, the likelihood is written as

$$L = \prod_{i=1}^{n} \prod_{j=1}^{J} \Pr(Y_i = j | x_i)^{d_{ij}}$$

where d_{ij} denotes a set of *J* dummy variables. In the meanwhile, for the cumulative logit and probit models, the log-likelihood in terms of model quantities can be expressed as follows [58]:

$$\log L = \sum_{i=1}^{n} \sum_{j=1}^{J} d_{ij} \log[F(\alpha_i + x_i'\beta) - F(\alpha_{j-1} + x_i'\beta)]$$

2.2. Study Design, Sample and Data Collection

The present study utilized the data from a written very highly reliable questionnaire (Cronbach alpha = 0.962) which was administered among inpatients and outpatients in Palandöken State Hospital, in Erzurum, northeastern Turkey. When the underlying questionnaire was conducted, the total number of the patients in the hospital was 9.821. The relevant sample size of the questionnaire was calculated with respect to the following formula

$$n = \frac{NPQZ^2}{(N-1)d^2 + PQZ^2}$$

where n denotes the sample size; N denotes the population size (herein the number of inpatients and outpatients; P = the probability of the occurrence for a given event; Q equals to 1 − P; Z denotes the test statistic under the (1 −α)% significance level; and finally d denotes the tolerance. The corresponding P and Q values are set to 0.50 to obtain the most adequate sample size requirement. In this respect, the minimum representative sample size of the survey can be calculated as follows [59]:

$$n = \frac{(9,821)(0.5)(0.5)(1.96)^2}{(9,821-1)(0.05)^2 + (0.5)(0.5)(1.96)^2} \cong 370$$

During the data collection procedure, 511 questionnaires were transformed and coded to a convenient computer-ready form, which exceeds the number of objective minimum sample size. Table 1 indicates the descriptive statistics of inpatients and outpatients in the corresponding hospital. The dependent variable of this study was the patient satisfaction, that was ordinal in nature where 1 = not at all satisfied, 2 = not satisfied, 3 = partially satisfied, 4 = satisfied, 5 = highly satisfied. Therefore, an ordered logit model was used to analyze the impact of independent variables on the patient satisfaction. According to descriptive statistics of dependent variable, most of the respondents (78.87%) are generally satisfied or highly satisfied with healthcare services of the corresponding hospital. More than half (50.68%) of the respondents are outpatients and more than half (50.68%) of them are women. Almost 64% of the respondents are married and more than 65% of them are aged between 24 and 54. More than 75% of the respondents are unemployed or self-employed, while more than 62% of them are primary or secondary educated. More than half (54.01%) of the respondents live in city center and almost 86% of them currently live in Erzurum. More than 76% of the respondents applied directly to the corresponding hospital and more than half (54.21%) of their social security insurances are SSK or green card. More than 76% of the respondents have a high re-visit intention to the corresponding hospital. Most of the

respondents (80.82%) are satisfied or highly satisfied with general cleanliness of the hospital. Almost 89% and 81% of the respondents are satisfied or highly satisfied with physicians' courtesy or response, respectively. Finally, most of the respondents (84.74%) trust their physician and more than 81% of them are satisfied or highly satisfied with other caregivers.

Table 1 Descriptive Statistics of Variables

Variable	Description	Frequency (Percentage)
Overall patient satisfaction	Dependent variable	
	1 = not at all satisfied	11 (2.15%)
	2 = not satisfied	24 (4.70%)
	3 = partially satisfied	73 (14.29%)
	4 = satisfied	210 (41.10%)
	5 = highly satisfied	193 (37.77%)
(1) Type of patient	Outpatient	259 (50.68%)
	Inpatient	252 (49.32%)
(2) Gender	Female	259 (50.68%)
	Male	252 (49.32%)
(3) Marital status	Single	186 (36.40%)
	Married	325 (63.60%)
(4) Age group	Age < 24	75 (14.68%)
	24 ≤Age ≤ 34	136 (26.61%)
	35 ≤ Age ≤ 44	99 (19.37%)
	45 ≤ Age ≤54	99 (19.37%)
	55 ≤ Age	102 (19.96%)
(5) Occupation	Officer	56 (10.96%)
	Unemployed	270 (52.84%)
	Worker	71 (13.89%)
	Self-employed	114 (22.31%)
(6) Level of education	Illiterate	48 (9.39%)
	Literate	62 (12.13%)
	Primary education	142 (27.79%)
	Secondary education	176 (34.44%)
	Higher education	83 (16.24%)
(7) Current residence	City center	276 (54.01%)
	County	79 (15.46%)
	Village	156 (30.56%)
(8) Settlement	Inner city	440 (86.11%)
	Out of city	71 (13.89%)
(9) Type of contact	Appointment	60 (11.74%)
	Direct	391 (76.52%)
	Transfer from another hospital	60 (11.74%)
(10) Health insurance	Bag-kur	80 (15.66%)
	Pension fund	67 (13.11%)
	SSK	190 (37.18%)
	Green card	87 (17.03%)
	No insurance	66 (12.92%)
	Other insurance	21 (4.11%)
(11) Re-visit intention	Not at all satisfied	14 (2.74%)
	Not satisfied	20 (3.91%)
	Partially satisfied	88 (17.22%)
	Satisfied	221 (43.25%)
	Highly satisfied	168 (32.88%)

(12) General cleanliness	Not at all satisfied	13 (2.54%)
	Not satisfied	21 (4.11%)
	Partially satisfied	64 (12.52%)
	Satisfied	273 (53.42%)
	Highly satisfied	140 (27.40%)
(13) Physician's courtesy	Not at all satisfied	9 (1.76%)
	Not satisfied	18 (3.52%)
	Partially satisfied	30 (5.87%)
	Satisfied	266 (52.05%)
	Highly satisfied	188 (36.79%)
(14) Physician's response	Not at all satisfied	8 (1.57%)
	Not satisfied	20 (3.91%)
	Partially satisfied	67 (13.11%)
	Satisfied	242 (47.36%)
	Highly satisfied	174 (34.05%)
(15) Trust to physician	Not at all satisfied	7 (1.37%)
	Not satisfied	20 (3.91%)
	Partially satisfied	51 (9.98%)
	Satisfied	231 (45.21%)
	Highly satisfied	202 (39.53%)
(16) Caregiver satisfaction	Not at all satisfied	14 (2.74%)
	Not satisfied	23 (4.50%)
	Partially satisfied	59 (11.55%)
	Satisfied	231 (45.21%)
	Highly satisfied	184 (36.01%)

3. Results

Table 2 presents the estimation results of independent variables used in the ordered logit model being fitted. For qualitative variables, several categories were defined as dummy variables to observe the real impact of each categories on the patient satisfaction of the respondents and also several categories were integrated to avoid multicollinearity and achieve unbiased outcome. The ordered model being fitted does not violate the parallel lines assumption where $\chi^2(90) = 105.12$ and the *p*-value (0.1316) of the corresponding χ^2 is more than 0.10 which rejects the null hypothesis.

The interpretation of the estimated results was accomplished based on the proportional odds ratios in Table 2. As indicated in Table 2, inpatients' and outpatients' re-visit intention (OR = 3.38; 90% CI = 2.66 – 4.30, $p < .01$) was the most significant driver of patient satisfaction given all other variables were held constant. In other words, a unit increase in respondents' re-visit intention, one can expect a 3.38 increase in the log-odds of being a higher satisfaction level given all of the other variables in the model were held constant. Similarly, the respondents were 1.66 times more highly satisfied than other combined satisfaction levels, in terms of general cleanliness (OR = 1.66; 90% CI = 1.35 – 2.04, $p < .01$) of the hospital. This result is consistent with earlier studies [10, 15, 18, 29, 30, 60] which put forward the relationship between patient satisfaction and physical environment. On the other hand, patients were 1.41 times more highly satisfied when they trust to the physician (OR = 1.41; 90% CI = 1.06 – 1.86, $p < .05$) relative to other combined satisfaction levels. Several earlier studies [24, 35] also highlight the association between physician trust and patient satisfaction. Patients were also 1.35 times more highly satisfied with other caregivers given that all of the other variables were held constant (OR = 1.35; 90% CI = 1.06 – 1.70, $p < .05$). Sun et al. (2000) [12]

underlined the importance of patient communication in patients' willingness to return. In this sense, following the early literature, the results of the present study about physician and caregiver satisfaction may be associated with the result of re-visit intention. Furthermore, this association between patient satisfaction and healthcare workers' courtesy is highly consistent with other previous studies [9, 14, 16-20, 22, 30, 46]. The estimation results showed that patients living in the county (OR = 0.58; 90% CI = 0.38 – 0.89, $p < .05$) were 0.58 times highly satisfied compared to other combined satisfaction levels given the other variables were held constant. This result is somewhat close with the finding of a very recent work [45] which revealed that patients living in villages are more satisfied. However, higher-educated patients (OR = 2.11; 90% CI = 1.12 – 4.00, $p < .10$) were approximately two times more highly satisfied. This result also shows consistency with recent work [38] which found evidence about higher-educated patients' increasing patient satisfaction. Type of patient decreases the probability of patient satisfaction (OR = 0.68; 90% CI = 0.47 – 0.99, $p < .10$), where being inpatients are more satisfied than outpatients. In contrast with prior researches [8, 34, 44], women (OR = 1.47; 90% CI = 1.01 – 2.14, $p < .10$) were 1.47 times more highly satisfied than men, given that all of the other variables in the model were held constant. One previous work [25] also found that women have higher patient satisfaction levels.

Table 2 Ordered Logit Estimation of Key Drivers for Patient Satisfaction

Independent variable	OR	Std. Err.	z-value	Sig.	[90% CI]
(1) Type of patient					
Outpatient	0.68	0.154	–1.70	0.090***	0.47 – 0.99
(2) Gender					
Female	1.47	0.337	1.69	0.092***	1.01 – 2.14
(3) Marital status					
Single	0.73	0.172	–1.35	0.178	0.49 – 1.07
(4) Age group (base Age < 24)					
24 ≤Age ≤ 34	0.87	0.295	–0.42	0.675	0.50 – 1.52
35 ≤ Age ≤ 44	0.92	0.356	–0.21	0.832	0.49 – 1.74
45 ≤ Age ≤ 54	0.56	0.215	–1.51	0.132	0.30 – 1.05
55 ≤ Age	0.96	0.351	–0.11	0.912	0.53 – 1.75
(5) Occupation (base Officer)					
Unemployed	0.72	0.269	–0.87	0.383	0.39 – 1.33
Worker	1.50	0.658	0.92	0.357	0.73 – 3.08
Self-employed	0.99	0.375	–0.02	0.988	0.53 – 1.85
(6) Level of education (base Illiterate)					
Literate	0.97	0.384	–0.09	0.931	0.50 – 1.86
Primary education	1.65	0.575	1.43	0.154	0.93 – 2.92
Secondary education	1.59	0.545	1.35	0.178	0.90 – 2.79
Higher education	2.11	0.819	1.93	0.054***	1.12 – 4.00
(7) Current residence (base City center)					
County	0.58	0.152	–2.08	0.037**	0.38 – 0.89
Village	1.09	0.253	0.36	0.719	0.74 – 1.59
(8) Settlement					
Out of city	0.91	0.198	–0.45	0.650	0.63 – 1.30
(9) Type of contact (base Appointment)					
Direct	0.95	0.447	–0.12	0.908	0.44 – 2.06
Transfer from another hospital	0.76	0.410	–0.50	0.614	0.32 – 1.85
(10) Health insurance (base Other)					
Bag-kur	0.55	0.290	–1.14	0.255	0.23 – 1.31
Pension fund	0.75	0.405	–0.54	0.589	0.30 – 1.82
SSK	0.92	0.452	–0.17	0.866	0.41 – 2.06

Green card	0.60	0.304	−1.00	0.315	0.26 – 1.38
No insurance	0.69	0.369	−0.69	0.489	0.29 – 1.66
(11) Re-visit intention	3.38	0.495	8.33	0.000*	2.66 – 4.30
(12) General cleanliness	1.66	0.208	4.02	0.000*	1.35 – 2.04
(13) Physician's courtesy	1.13	0.171	0.79	0.429	0.88 – 1.45
(14) Physician's response	0.96	0.148	−0.29	0.771	0.74 – 1.23
(15) Trust to physician	1.41	0.242	1.98	0.047**	1.06 – 1.86
(16) Caregiver satisfaction	1.35	0.192	2.08	0.037**	1.06 – 1.70
/cut1	3.13	1.099			1.32 – 4.94
/cut2	5.12	1.104			3.31 – 6.94
/cut3	7.43	1.142			5.56 – 9.31
/cut4	10.4	1.186			8.44 – 12.3

Number of observations = 511
Log-likelihood = −463.07
LR $\chi^2(30)$ = 338.53
Probability > χ^2 = 0.000
Pseudo R^2 = 0.2677

4. Model Specification

The multicollinearity test was performed to the ordered logit model being fitted, by evaluating the variance inflation factor, hereafter VIF, values of independent variables. In principal, variables which have VIF values more than 10 are considered as they lead to multicollinearity problem and biased results. As shown in Table 3, none of the key drivers have VIF values more than 10 and no serious multicollinearity problem was found.

Table 3 Multicollinearity Test

Variable	**VIF**	**1/VIF**
(1) Care		
Outpatient	1.55	0.647
(2) Gender		
Female	1.62	0.618
(3) Marital status		
Single	1.65	0.607
(4) Age group		
25-34	2.72	0.368
35-44	2.79	0.358
45-54	2.79	0.358
55 and older	2.59	0.386
(5) Occupation		
Unemployed/Housewife	4.25	0.235
Worker	2.75	0.364
Self-employment	3.13	0.320
(6) Level of education		
Literate	2.13	0.469
Primary education	3.03	0.330
Secondary education	3.28	0.305
Higher education	2.45	0.408
(7) Current residence		
County	1.16	0.865
Village	1.34	0.745
(8) Settlement		
Out of city	1.15	0.869

(9) Type of appointment		
Direct appointment	3.83	0.261
Transfer from another hospital	3.78	0.264
(10) Health insurance		
Bag-kur	4.54	0.220
Emekli sandigi	4.17	0.240
SSK	6.95	0.144
Green card	4.52	0.221
No insurance	4.02	0.249
(11) Re-visit intention	1.97	0.507
(12) General cleanliness	1.51	0.661
(13) Physician's courtesy	2.02	0.496
(14) Physician's response	2.31	0.434
(15) Trust to physician	2.71	0.369
(16) Caregiver satisfaction	2.25	0.445
Mean VIF	**2.83**	

Table 4 presents the measures of fit values of the ordered logit model being fitted. As the model has very small and negative Akaike and Bayesian Information Criteria, respectively, it may be suggested that the model has acceptable measures of fit.

Table 4 Goodness-of-fit

Measures of fit criteria	**Value**
Log-likelihood intercept only	−697.113
Log-likelihood full model	−463.074
LR(30)	357.929
P > LR	0.000
Adjusted R^2	0.473
Akaike information criteria	2.149
Bayesian information criteria	**−1957.160**

5. Conclusion

Nowadays, patient satisfaction is adopted as an essential component of any health care system for effective and quality patient care. In this circumstance, exploring patients' needs and expectations periodically provides a practical quality assurance for many health agencies. In the meanwhile, many factors may possibly have impact on overall patient satisfaction and determining these potential factors may facilitate improving current health care standards. Particularly, they may also serve as control mechanisms for policy and decision-makers' present and future process management. The present paper aims to determine the key demographic, socio-economic and physical drivers of overall patient satisfaction in a Turkish state hospital using an ordered logit analysis because dependent variable has a natural ordering. The empirical results of this study exhibit that inpatients are more highly satisfied with the total quality of the health care. On the other hand, women or higher-educated patients were more highly satisfied than men and lower-educated patients, respectively. However, patients living in a county were less highly satisfied with the health care quality. The results also showed that patients' satisfaction was also significantly affected by several drivers including revisit intention, general cleanliness of the hospital, trust to physician, and other caregivers' courtesy. As in other studies, this paper has some limitations in terms of sample size and variables used in the model. Further studies may use other independent variables in the model being fitted using other convenient analysis methods and particularly, they may provide successful comparisons of health institutions or regions. In that manner, policy and

decision makers of health industry may benefit from further evidence to improve quality of health care standards.

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