

Kingdom of Saudi Arabia
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**APPLICATION OF FACTOR ANALYSIS TECHNIQUE
FOR DETERMINING THE DIMENSIONS OF
PATIENT SATISFACTION AND ITS ATTRIBUTES AT
THE UNIVERSITY TEACHING HOSPITALS IN
RIYADH, SAUDI ARABIA**

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I. INTRODUCTION

Quality of medical care has been defined and measured by various objective as well as subjective measures. Although there is a general consensus that patient satisfaction is a "subjective" measure of quality of care, the significance of patient satisfaction can be seen from the extensive research studies that have been conducted over the past two decades. Collectively, those research studies concluded that patient satisfaction plays an important role in the evaluation of both service providers and the quality of care. Patient satisfaction can be considered not only as an indicative of the effectiveness of health programs being implemented but also as a predictor of future health-related patient behavior such as compliance, change of provider and disenrollments in health plans.

II. IMPORTANCE OF PATIENT SATISFACTION

Patient satisfaction information provides a viewpoint that is necessary for complete, unbiased evaluation of health care services. It can contribute to a more balanced assessment of the health system's components, viz the structure, process, and outcomes of care. This information highlights the personal preferences of patient's which cannot be replaced by direct observation of care. Patient satisfaction surveys assist in understanding why people do or do not seek care, and their background

characteristics. It has been pointed out that patient satisfaction is a desirable outcome, a measure of quality and a predictor of patient behavior⁽¹⁾. Patient satisfaction surveys may uncover potential attributes associated with levels of satisfaction. Knowledge of predispositional factors can be beneficial in redesigning health policies and procedures. Therefore, patient satisfaction surveys may be useful for policy making and planning purposes.

The patient's view is an important and indispensable source of information about diagnostic and therapeutic procedures, attitudes and expectations toward services provided. Moreover, patient satisfaction surveys may provide suggestions for upgrading health care services, and may identify attributes that exert influences on the effectiveness of the services provided. In this regard, patient satisfaction is one of the desirable outcomes that the Saudi Government wants to achieve. This has been confirmed by the Fourth Five-Year Plan (1985-1990)⁽²⁾

(1) R. Heather Palmer, Avedis Donabedian, Gail J. Povar, Striving for Quality in Health Care: An Inquiry into Policy and Practice, Health Administration Press, Ann Arbor, Michigan, 1991.

(2) Ministry of Planning, Fourth Development Plan, 1985-1990, Kingdom of Saudi Arabia, 1985, p. 62.

III. OBJECTIVES OF THE STUDY

Through the application of factor analysis approach, the present study attempts to achieve the following objectives:

- 1) to identify the principal dimensions of patient satisfaction; and
- 2) to determine the major factors that influence patient satisfaction at Saudi teaching hospitals in Riyadh City.

IV. MEASURES OF PATIENT SATISFACTION

Many empirical studies have explored patient satisfaction with health and medical care services. Surveys tend to use a single global rating, or a series of related questions, to assess levels of satisfaction with care.

A commonly used approach has been the Client Satisfaction Questionnaire (CSQ). Different versions of this approach have been used by investigators^(3,4). The other approaches that are repeatedly used are the Patient

(3) Robert E. Roberts, C. Clifford Attkisson, Assessing Client Satisfaction Among Hispanics, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 401-413.

(4) Thomas R. Zastowny, Klaus J. Roghmann, Acco Hengst, Satisfaction with Medical Care: Replication and Theoretic Reevaluation, Medical Care, Vol. 21, No. 3, March 1983, pp. 294-322.

Satisfaction Questionnaire (PSQ) (5,6) and the Non-Metric Multidimensional Scaling (MDS) designed by Roghmann et al (7,8).

The Evaluation Rating Scale (ERS) (9) is designed to provide more specific information about program components. The ERS results specify the relative significance of different dimensions and include negative as well as positive attitudes of patients regarding each dimension. Thus, ERS provides a stronger basis

(5) Naomi Breslau, Continuity Reexamined: Differential Impact on Satisfaction with Medical Care for Disabled and Normal Children, Medical Care, Vol. 20, No. 4, April 1982, pp. 347-360.

(6) John E. Ware, Jr., Mary K. Snyder, W. Russell Wright, Allysson R. Davies, Defining and Measuring Patient Satisfaction with Medical Care, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 247-263.

(7) Gregory L. Weiss, Patient Satisfaction with Primary Medical Care: Evaluation of Sociodemographic and Predispositional Factors, Medical Care, Vol. 26, No. 4, April 1988, pp. 383-392.

(8) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Disability and Patient Satisfaction with Medical Care, Medical Care, Vol. 21, No. 11, Nov. 1983, pp. 1062-1075.

(9) Robert E. Roberts, Gregory C. Pascoe, C. Clifford Attkisson, Relationship of Service Satisfaction to Life Satisfaction and Perceived Well-being, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 373-384.

for deciding which agency features require modification. Furthermore, the ERS gives information which is more useful in decision making.

Few studies have attempted to replicate methods of measurement used in earlier researches. The tendency of researchers to invent their own questionnaires, or to modify existing scales, makes it difficult to determine whether the original and modified versions measure the same thing.

Validity of patient satisfaction measures has been addressed by some researchers. For instance, Larsen et al ⁽¹⁰⁾ developed a comprehensive conceptual framework and obtained strong evidence of validity and reliability. However, no single instrument, either at the macro or micro level, has been fully validated.

V. SOCIO-DEMOGRAPHIC FACTORS AND SATISFACTION

Sociodemographic factors are considered in most of the studies reviewed. Findings have been inconsistent; Weiss ⁽¹¹⁾, for example, found

(10) D. L. Larsen, C. C. Attkisson, W. A. Hargreaves, T. D. Nguyen, Assessment of Client/Patient Satisfaction: Development of General Scale, Evaluation and Program Planning, Vol. 2, 1979, p. 197.

(11) Gregory L. Weiss, Op. cit., pp. 383-392.

sociodemographic variables had no statistically significant effect on patient satisfaction. Fox and Storms⁽¹²⁾, concluded that when sociodemographic factors are considered, together with other variables, they have no significant effect on patient satisfaction. The findings of Brody et al⁽¹³⁾ also support this conclusion.

Other studies found that sociodemographic variables exert a significant influence on patient satisfaction^(14,15). Thus, there is no clear explanation for the effects of the differing results obtained.

(12) John G. Fox, Doris M. Storms, A Different Approach to Sociodemographic Predictors of Satisfaction with Health Care, Social Science and Medicine, Vol. 15A, No. 5, Sept. 1981, pp. 557-564.

(13) David S. Brody, Suzanne M. Miller, Caryn E. Lerman, David G. Smith, Carlos G. Lazaro, Mindy J. Blum, The Relationship Between Patient's Satisfaction with Their Physicians and Perceptions About Interventions They Desired and Received, Medical Care, Vol. 27, No. 11, Nov. 1989, pp. 1027-1035.

(14) B. S. Hulka, S. J. Zyzanski, J. C. Cassel, S. J. Thompson, Satisfaction with Medical Care in a Low Income Population, J. Chron Dis, Vol. 24, 1971, p. 661.

(15) Thomas R. Zastowny, Klaus J. Roghmann, Acco Hengst, Op. cit., pp. 294-322.

SEX

Studies by Pope⁽¹⁶⁾, Greenley and Schoenherr⁽¹⁷⁾ and Krol and Nordlund⁽¹⁸⁾ concluded that satisfaction is not associated with sex. On the other hand, DiMatteo and Hays⁽¹⁹⁾ Patrick and his associates⁽²⁰⁾ and Greenfield⁽²¹⁾ found that females are slightly more satisfied with services provided than are

(16) C. R. Pope, Consumer Satisfaction in a Health Maintenance Organization, J Hlth Soc Behav, Vol. 19, 1978, p. 291.

(17) J. R. Greenley, R. A. Schoenherr, Organization Effects on Client Satisfaction with Humaneness of Service, J Hlth Soc Behav, Vol. 22, 1981, p. 2.

(18) R. A. Krol, D. J. Nordlund, Patient-Satisfaction Data and Residents' Physician-Patient Skills, J Fam Pract, Vol. 17, 1983, p. 141.

(19) M. R. DiMatteo, R. Hays, The Significance of Patient's Perceptions of Physician Conduct: A Study of Patient Satisfaction in a Family Practice Center, J Communit Hlth, Vol. 6, 1980, p. 18.

(20) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Op. cit., pp. 1062-1075.

(21) Thomas K. Greenfield, The Role of Client Satisfaction in Evaluating University Counseling Services, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 315-326.

males. Ware and his associates⁽²²⁾ reached a similar finding. On the other hand, Gerst and Hetherington⁽²³⁾ found males were somewhat more satisfied than females, but not significantly.

EDUCATION

The relationship between educational background and satisfaction with health care was inconclusive in studies conducted by Weiss⁽²⁴⁾, Greenley and Schoenherr⁽²⁵⁾ and Krol and Nordlund⁽²⁶⁾. On the other hand, Chaska et al⁽²⁷⁾ and Linn⁽²⁸⁾ found that patients with

(22) John E. Ware, Jr. Mary K. Snyder, W. Russell Wright, Allysson R. Davies, Op. cit., pp. 247-263.

(23) A. L. Gerst, R. Hetherington, Patterns of Satisfaction with Health Plan Coverage: A Conceptual Approach, Inquiry, Vol. 6, 1969, p. 37.

(24) Gregory L. Weiss, Op. cit., pp. 383-392.

(25) J. R. Greenley, R. A. Schoenherr, Op. cit., p. 2.

(26) R. A. Krol, D. J. Nordlund, Op. cit., p. 141.

(27) N. L. Chaska, I. Krishan, R. K. Smoldt, et al., Use of Medical Services and Satisfaction with Ambulatory Care Among a Rural Minnesota Population, Public Health Report, Vol. 95, 1980, p. 44.

less education were significantly more likely to evaluate their physicians positively than were patients with more education. Studies by Gerst and Hetherington⁽²⁹⁾, Zastowny et al⁽³⁰⁾ and Hulka et al⁽³¹⁾ reported that highly educated patients tended to express high satisfaction with care. Linder-Pelz and her associates⁽³²⁾ found that educated patients reported more dissatisfaction with services received.

A study of chronically ill patients revealed that patient satisfaction with art of care and technical quality of care was not affected by education. However, less educated patients reported more satisfaction with the efficacy of care⁽³³⁾.

(28) Lawrence S. Linn, Factors Associated with Patient Satisfaction of Health Care, Milbank Memorial Fund Quarterly, Vol. 53, 1975, p. 531.

(29) A. L. Gerst, R. Hetherington, Op. cit., p. 37.

(30) Thomas R. Zastowny, Klaus J. Roghmann, Acco Hengst, Op. cit., pp. 294-322.

(31) B. S. Hulka, S. J. Zyzanski, J. C. Cassel, S. J. Thompson, Op. cit., p. 661.

(32) Susie Linder-Pelz, Leon Epstein, Ada Tamir, The Meaning of Patient Satisfaction with Prepaid Primary Health Care in Israel, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 385-393.

(33) Lawrence S. Linn, Sheldon Greenfield, Patient Suffering and Patient Satisfaction Among

AGE

Results of studies which examined the relationship between patient's age and satisfaction with care were also inconsistent. Penchansky and Thomas⁽³⁴⁾, Krol and Nordlund⁽³⁵⁾, and Linder-Pelz and her colleagues⁽³⁶⁾ found no significant effect between age and patient satisfaction.

Other studies reported statistically significant relationships between patient's age and satisfaction^(37,38). Older patients were more satisfied with medical care than were

the Chronically Ill, Medical Care, Vol. 20, No. 4, April 1982, pp. 425-431.

(34) Roy Penchansky, J. William Thomas, The Concept of Access: Definition and Relationship to Consumer Satisfaction, Medical Care, Vol. 19, No. 2, Feb 1981, pp. 127-140.

(35) R. A. Krol, D. J. Nordlund, Op. cit., p. 141

(36) Susie Linder-Pelz, Leon Epstein, Ada Tamir, Op. cit., pp. 385-393.

(37) M. R. DiMatteo, R. Hays, Op. cit., p. 18.

(38) James R. Greenley, Theresa B. Young, Richard A. Shoenherr, Psychological Distress and Patient Satisfaction, Medical Care, Vol. 20, No. 2, April 1982, pp. 373-385.

patients in other age groups. De Brey⁽³⁹⁾ found an inverse relationship between age and satisfaction with older patients expressing more dissatisfaction than younger patients.

INCOME

Breslau and Mortimer⁽⁴⁰⁾ and Weiss⁽⁴¹⁾ found no relationship between patient income and satisfaction. However, other studies reported that higher income was directly related to higher levels of satisfaction, while less patient satisfaction was found in the lowest income groupings in various studies^(42,43).

(39) Henk de Brey, A Cross-national Validation of Client Satisfaction Questionnaire: The Dutch Experience, Evaluation and Program Planning, Vol. 6, Nos. 3 and 4, 1983, pp. 395-400.

(40) Naomi Breslau, Edward A. Mortimer, Jr., Seeing the Same Doctor: Determinants of Satisfaction with Specialty Health Care for Disabled Children, Medical Care, Vol. 19, No. 7, July 1981, pp. 741-758.

(41) Gregory L. Weiss, Op. cit., pp. 383-392.

(42) A. L. Gerst, R. Hetherington, Op. cit., p. 37.

(43) N. L. Chaska, I. Krishan, R. K. Smoldt, et al., Op. cit., p. 44.

MARITAL STATUS

Satisfaction was higher among married than among single patients in studies by Gerst and Hetherington⁽⁴⁴⁾ and Bashshur et al⁽⁴⁵⁾. On the other hand, Hulka et al⁽⁴⁶⁾ and Penchansky and Thomas⁽⁴⁷⁾ found no significant difference between married and non-married groups with regard to patient satisfaction.

EMPLOYMENT STATUS

Linn and Greenfield⁽⁴⁸⁾ measured three dimensions of satisfaction: 1) art of care; 2) technical quality and 3) efficacy among chronically ill patients. Satisfaction for all three dimensions was significantly affected by employment status. Retired patients were the most satisfied, followed by employed patients, while unemployed patients were the least

(44) A. L. Gerst, R. Hetherington, Op. cit., p. 44.

(45) R. L. Bashshur, C. A. Metzner, C. Worden, Consumer Satisfaction with Group Practice, the CHA Case, American Journal of Public Health, Vol. 57, 1967.

(46) B. S. Hulka, S. J. Zyzanski, J. C. Cassel, S. J. Thompson, Op. cit., p. 661.

(47) Roy Penchansky, J. William Thomas, Op. cit., pp. 127-140.

(48) Lawrence S. Linn, Sheldon Greenfield, Op. cit., pp. 425-431.

satisfied. There was no significant difference between full-time and part-time workers. Penchansky and Thomas⁽⁴⁹⁾ concluded that those who are not working (housewife) were significantly more dissatisfied with accessibility.

However, Fox and Storms⁽⁵⁰⁾ found that retired people and homemakers are more satisfied than those in other job categories. Patrick and his colleagues⁽⁵¹⁾ found unemployed people significantly less likely to be dissatisfied than the employed.

VI. OTHER PREDICTORS OF PATIENT SATISFACTION

CONTINUITY OF CARE

Shortell⁽⁵²⁾ defined continuity of care as the extent to which a patient receives needed medical services in a coordinated and uninterrupted succession of events. The study of

(49) Roy Penchansky, J. William Thomas, Op. cit., pp. 127-140.

(50) John G. Fox, Doris M. Storms, Op. cit., pp. 557-564.

(51) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Op. cit., pp. 1062-1075.

(52) Stephen M. Shortell, Continuity of Medical Care, Conceptualization and Measurement, Medical Care, Vol. 14, 1976, p. 377.

Marquis et al (53) showed that satisfaction ratings can be such valid predictors of patient behavior that dissatisfaction can result in a change of provider. Even a small change in satisfaction can have significant effect on patient behavior. Change in doctors and disenrollments from prepaid health plans can be significantly predicted by patient behavior.

Most previous research considered continuity of care as a characteristic of the medical care experience, and treated patient satisfaction as an outcome of that experience. A statistically significant positive relationship between patient satisfaction and continuity of care was identified. For instance, Hulka et al (54), Weinberger et al (55) and Marquis et al (56) concluded that patients who had a regular

(53) M. Susan Marquis, Allysson Ross Davies, John E. Ware, Jr., Patient Satisfaction and Change in Medical Care Provider: A Longitudinal Study, Medical Care, Vol. 21, No. 8, Aug. 1983, pp. 821-829.

(54) B. S. Hulka, et al., Correlates of Satisfaction and Dissatisfaction with Medical Care: A Community Perspective, Medical Care, Vol. 13, 1975, p. 648.

(55) M. Weinberger, J. Y. Greene, J. J. Mamlin, The Impact of Clinical Encounter Events on Patient and Physician Satisfaction, Social Science and Medicine, Vol. 15E, 1981, p. 239.

(56) M. Susan Marquis, Allysson Ross Davies, John E. Ware, Jr., Op. cit., pp. 821-829.

physician and a long term relationship were more satisfied. They were less likely to report having seen multiple physicians or having changed physicians.

PERCEIVED HEALTH STATUS

Patrick et al (57) and Linn and Greenfield (58) found that persons with lower perceived health status were more dissatisfied than those with higher perceived health status. Patients who spent more days in bed, were more depressed or reported poorer health were less satisfied with their health care. Physical disability significantly affected satisfaction for technical quality and efficacy of care. It had no bearing on satisfaction with the art of care (59). Severity of illness had a negative effect on satisfaction. Patients who perceived their illness as being more severe were more dissatisfied with the service they received (60).

(57) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Op. cit., pp. 1062-1075.

(58) Lawrence S. Linn, Sheldon Greenfield, Op. cit., pp. 425-431.

(59) Ibid.

(60) Lawrence S. Linn, Robert H. Brook, Virginia A. Clark, Allysson Ross Davies, Arlene Fink, Jacqueline Kosecoff, Physician and Patient Satisfaction as Factors Related to the Organization of Internal Medicine Group Practices, Medical Care, Vol. 23, No. 10, Oct. 1985, pp. 1171-1178.

PHYSICIANS CHARACTERISTICS

Murphy-Cullen and Larsen⁽⁶¹⁾ tried to examine the effect of sociodemographic characteristics of resident physicians on patient satisfaction. It was found that as the sociodemographic characteristics of the patient do not have any significant effect on satisfaction, those of the physician likewise do not have any significant impact on patient satisfaction. However, younger physicians (30 years old and below) received a higher rating regarding general satisfaction, perception of affective behavior and technical competence. The study suggests that the most significant determinant of patient satisfaction is the uniqueness of human exchange.

It should be noted here that literature reviews were limited to the variables that had been included in this study. Also, literatures on satisfaction from market research (such as the concept of market segmentation and product niches that directly relate to satisfaction) were not included in this study.

(61)C. L. Murphy-Cullen, L. C. Larsen, Interaction Between the Socio-demographic Variables of Physicians and Their Patients: Its Impact Upon Patient Satisfaction, Social Science and Medicine, Vol. 19, 1984, p. 163.

VII. METHODOLOGY

The present study was conducted in the out-patient specialty clinics at two university teaching hospitals, viz King Khalid University Hospital (KKUH) and King Abdul-Aziz University Hospital (KAUH) in the Riyadh city. Both hospitals are attached to the Medical College of King Saud University, and they provide medical services, free of charge to the public as well as to King Saud University students, employees and their dependents.

Data were collected from only return patients who were selected through simple random technique. They were contacted and interviewed using a designed questionnaire while they were waiting in the pharmacy waiting rooms to get their drug prescriptions. The main reason in contacting and interviewing patients in the pharmacy waiting rooms is due to the fact that all out-patients have already seen their doctors and have, to some extent, an idea of the quality of services provided. New patients were excluded from the study due to the fact that such patients may not have enough knowledge about the hospitals under study, and therefore their responses may not be reliable.

The sample consisted of all Arabic-speaking patients. Two hundred and sixty-seven patients were requested to fill out a questionnaire. Of the 267 respondents, 241 (90.25%) had completed

their questionnaires, and therefore they were retained in the analysis.

Basically, two major hypotheses are presented in this study. These are:

1) there is a relationship between sociodemographic attributes included in this study and patient satisfaction.

2) there is a relationship between predispositional attributes included in this study and patient satisfaction.

Figure 1 shows the proposed relationship between sociodemographic factors, predispositional factors, and patient satisfaction in Saudi teaching hospitals.

FACTOR ANALYSIS

Patient satisfaction has been defined and measured as a multidimensional concept. Respondents were asked to indicate their agreement or disagreement about specific statements with regard to their satisfaction with medical and health care received at the out-patient clinics. Twenty-two statements of the extent of patient satisfaction were included in this study (Table 1). Factor analysis was used to simplify complex and diverse relationships that exist among a set of observed variables. Factor analysis can assist

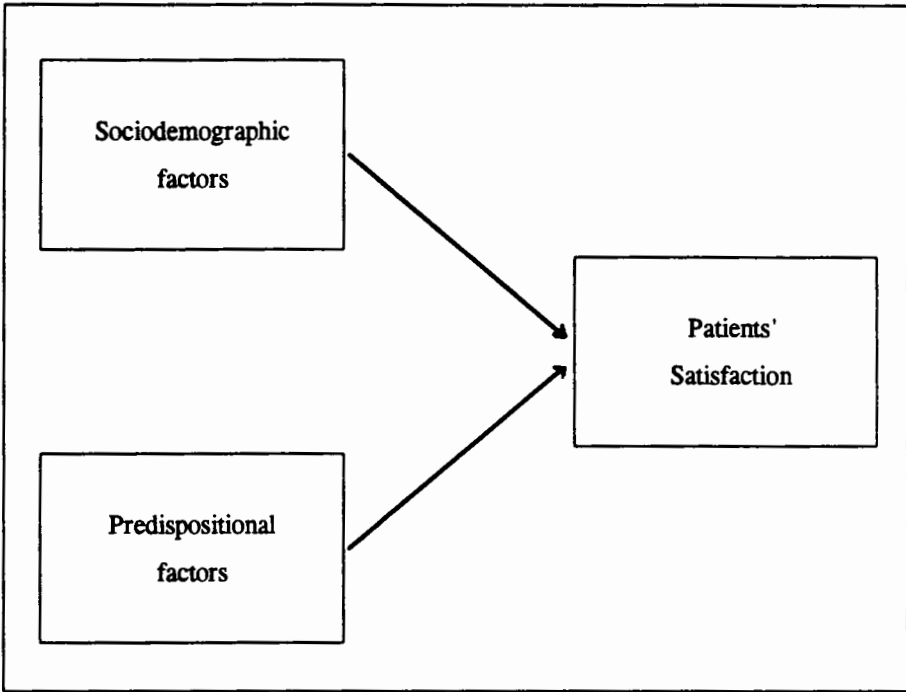


Figure 1. The Relationship Between Sociodemographic Factors, Predispositional Factors and Patients' Satisfaction in Saudi Teaching Hospitals.

researchers in deciding whether the true attribute is unidimensional, combining all aspects of patient satisfaction, or whether the attribute must be thought of as multidimensional (62).

This technique provides a means of measuring the true attribute by combining the observable indices in a manner which weighs each index most efficiently. Each of the produced indices will result in a common factor. The varimax rotation method was used to generate factors that could be retained in the analysis. Then, through multiple regression technique, factor scores of the produced factors were used as a measure of the dependent variables.

As indicated in table 1, factor analysis produced three common factors out of the twenty-two statements on patient satisfaction. Factor 1 has high loadings on statements 1 through 8. These items are grouped together indicating that they are highly correlated with one another. By examining each item (or statement), it seems that they represent the technical quality of care and therefore the first factor has been called "technical care".

(62) Arnold D. Kaluzny, James E. Veney, Health Service Organizations: A Guide to Research and Assessment, McCutchan Publication Corp., California, 1980, p. 200.

Table 1. Factor Loadings for 22 Statements on Patient Satisfaction with Medical and Healthcare Received, Riyadh, Saudi Arabia, 1993.

STATEMENTS	FACTOR 1 (technical care)	FACTOR 2 (art of care)	FACTOR 3 (amenities of care)	COMMUNALITY
S1. Most doctors were competent	0.602	-0.021	0.193	0.31
S2. My doctor was very thorough in examining me	0.586	0.014	0.136	0.07
S3. Patients receive the best care from their doctors	0.539	-0.141	-0.002	0.28
S4. Most doctors clearly explain to their patients what is wrong	0.534	0.285	0.215	0.31
S5. Doctors spend as much time as necessary with each patient	0.528	0.048	0.002	0.32
S6. Most doctors give enough information about health status	0.525	0.077	-0.030	0.41
S7. Most doctors teach patient how to prevent sickness	0.507	-0.146	0.371	0.28
S8. Most doctors are careful when they treat patients	0.485	-0.134	-0.176	0.29
S9. Convenient office hours	0.381	0.359	0.191	0.50
S10. Most receptionists were courteous	0.313	0.124	0.206	0.40
S11. Treatment plan was well organized	0.301	0.252	-0.076	0.82
S12. Most nurses were not organized	0.220	-0.065	0.065	0.28
S13. Most nurses were courteous	0.111	0.049	-0.073	0.52
S14. Short office waits	-0.152	0.207	0.069	0.42
S15. Most doctors were willing to listen to patient's problems	0.045	0.711	-0.128	0.16
S16. Most doctors were friendly	-0.095	0.670	0.194	0.02
S17. My doctor made me less worried	-0.133	0.625	-0.022	0.79
S18. Doctors are concerned with patients	0.027	0.541	-0.020	0.16
S19. Doctors take a real interest in patients	0.242	0.423	0.289	0.36
S20. My doctor had no difficulty to understand my case	0.141	0.415	0.269	0.06
S21. Appearance of doctor's office was acceptable	-0.038	0.122	0.898	0.41
S22. Staff did care about my privacy	0.060	-0.103	0.881	0.26

Note: 1 = Strongly agree; 2 = Agree; 3 = Not sure; 4 = Disagree; 5 = Strongly disagree

The items 15 through 20 contribute to define the second factor. By and large, these items reflect the way physicians deal with patients. Therefore, factor 2 has been termed "art of care". Factor 3 has high loadings only on two statements, namely 21 and 22. These two items reflect the appearance of physician's office and privacy of treatment. Factor 3 has been called "amenities of care." Table 2 presents factor loadings for the significant statements on the three dimensions of patient satisfaction with medical and healthcare received.

Other items (9 through 14) have low loadings on the three factors. This may reveal that these items contribute little to the understanding of the underlying dimension or factor.

MULTIPLE REGRESSION ANALYSIS

In order to examine the relationship between the independent variables and the dependent variables, the multiple regression technique was conducted by regressing independent socio-demographic and predispositional variables on the factors scores of patient satisfaction as the main dependent variable. In this connection, the individual t-tests and their significant levels were computed. The t-statistic identifies whether the addition of one independent variable to the model would significantly improve prediction of

Table 2. Factor Loadings for the Significant Statements on the Three Dimensions of Patient Satisfaction with Medical and Healthcare Received, Riyadh, Saudi Arabia, 1993.

STATEMENTS	FACTOR 1 (technical care)	FACTOR 2 (art of care)	FACTOR 3 (amenities of care)
S1. Most doctors were competent	0.602		
S2. My doctor was very thorough in examining me	0.586		
S3. Patients receive the best care from their doctors	0.539		
S4. Most doctors clearly explain to their patients what is wrong	0.534		
S5. Doctors spend as much time as necessary with each patient	0.528		
S6. Most doctors give enough information about health status	0.525		
S7. Most doctors teach patient how to prevent sickness	0.507		
S8. Most doctors are careful when they treat patients	0.485		
S15. Most doctors were willing to listen to patient's problems		0.711	
S16. Most doctors were friendly		0.670	
S17. My doctor made me less worried		0.625	
S18. Doctors are concerned with patients		0.541	
S19. Doctors take a real interest in patients		0.423	
S20. My doctor had no difficulty to understand my case		0.415	
S21. Appearance of doctor's office was acceptable			0.898
S22. Staff did care about my privacy			0.881

Note:

1 = Strongly agree; 2 = Agree; 3 = Not sure; 4 = Disagree; 5 = Strongly disagree

the variability of the dependent variable, controlling other variables in the model. The t-test can be calculated by a formula of:

$$t = \frac{\hat{B}^*}{\frac{S^{\wedge}}{B^*}}$$

where B is the corresponding estimated coefficient and S is the estimate of standard error of B.

Furthermore, the overall F tests were used to test the significance of the whole regression model in order to determine whether or not all of the independent variables (predictors) taken together significantly contribute to the prediction of the dependent variables. The F statistic was computed by dividing the mean-square regression on the mean-square residual.

The multiple regression technique is used not only to explain the effects and its magnitude of the independent variables on the dependent variable at a time, but also it can be used to estimate the best model based on several independent variables and the dependent variable.

This approach is based on the following linear model: (63)

$$Y = B_1X_1 + B_2X_2 + B_3X_3 + . . . + B_nX_n$$

where Y = the observed values of the dependent variables.

X_i = the observed values of the independent variables.

B_j = the regression coefficients that need to be estimated.

As mentioned before, in the light of testing the stated hypotheses, the techniques of correlation analysis and the method of multiple regression were used in order to study and to analyze the relationship between independent variables' measures and the dependent variables measures as follows:

- a. the relationship between patient satisfaction (a. dependent variable) and sociodemographic factors (as independent variables).
- b. the relationship between patient satisfaction (as dependent variable) and predispositional factors (as independent variables).

(63) Ibid., p. 266.

VIII. RESULTS

Table 3 presents the frequency distribution of all independent variables included, their means and standard deviation. The table indicates that the means of patients' age, education, monthly income and distance from home are 31 years old, 11 years of education, 4826.8 Saudi riyals per month and 8.2 km distance from home, respectively.

Also, the same table shows that the means of number of visits during the last 6 months and waiting time in clinic are 10 visits and 46.1 minutes, respectively. The data also indicate that 63.3% of the respondents were Saudis, 83% were married, 74.5% perceived their health status as good, 82.8% had little health concern, 62.8% had continuity of care, and 79% reporting that they spent only a short time to get an appointment.

Further, Table 3 represents the measurement codes for each independent variable. For the purpose of regression analysis, it should be noted that all dichotomous variables have been coded as zero or one. In this connection, it has been recommended by various scholars that the most frequent category to be chosen as the reference category (or omitted category), so that the dummy regression coefficients represent

Table 3. Frequency Distribution of Independent Variables, Their Means and Standard Deviations, Riyadh, Saudi Arabia, 1991.

INDEPENDENT VARIABLES	MEASUREMENT CODE	MEAN	STD. DEV.	PERCENT DISTRIBUTION
Socio-demographic Variables				
Age	Continuous	31.1	9.5	< 30 years = 43.9% > 29 years = 56.1%
Gender	Male = 1	0.5	0.5	Male = 49.4% Female = 50.6%
Nationality	Non-Saudi = 1	0.4	0.5	Saudi = 63.3% Non-Saudi = 36.7%
Education	Continuous	11.3	5.0	< 12 years = 41.2% > 11 years = 58.8%
Monthly income	Continuous	4826.8	2885.7	< SR 5000 = 49.4% > SR 4999 = 50.6%
Employment	Unemployed = 1	0.5	0.5	Unemployed = 50.8% Employed = 49.2%
Marital status	Single = 1	0.2	0.4	Single = 16.9% Married = 83.1%
Distance from home	Continuous	8.2	2.0	< 5 Km = 4.5% > 4 Km = 95.5%
Predispositional Variables				
Number of visits	Continuous	10.0	9.4	< 10 visits = 61.6% > 9 visits = 38.4%
Health status	Poor = 1	0.3	0.4	Good health status = 74.5% Poor health status = 25.5%
Health concern	Concerned = 1	0.2	0.4	High concern = 17.2% Low concern = 82.8%
Continuity of care	Yes = 1	0.4	0.5	High continuity = 37.2% Low continuity = 62.8%
Time to get appointment	Very long = 1	0.2	0.4	Very long = 21.0% Very short = 79.0%
Waiting time in clinic	Continuous	46.1	31.2	< 30 minutes = 30.9% > 29 minutes = 69.1%

deviations of smaller groups from the largest group⁽⁶⁴⁾.

As seen in Table 4, there are three different regression models, viz technical care, art of care and amenities of care which were regressed on sociodemographic and predispositional variables. In the case of factor 1 (technical care), factor scores were used as the main dependent variable of technical care.

The results indicate that the overall F- test for this model is significant ($P < 0.01$) yielding an F-value equal to 6.33 with 14 and 226 degrees of freedom. The R-square equals 0.28, which indicates that the independent variables jointly explain about 28 percent of the variation of the dependent variable.

In the case of regression model of technical quality, there are fourteen sociodemographic and predispositional independent variables, and only five out of these fourteen variables have statistically significant coefficients. These are patient's gender, nationality, number of visits, continuity of care and time to get an appointment. According to the t-tests, other independent variables are not significant. This

(64) L. Polissar, P. Diehr, Regression Analysis in Health Services Research: The Use of Dummy Variables, Medical Care, Vol. 20, 1982, p. 959.

Table 4. Multiple Regression of Factor Scores of 22 Items Patient Satisfaction on Patient Socio-Demographic and Predispositional Attributes, Riyadh, Saudi Arabia, 1991 (N = 241).

INDEPENDENT VARIABLES	FACTOR SCORES AS DEPENDENT VARIABLES (higher values indicate greater dissatisfaction)					
	Factor 1 (Technical care)		Factor 2 (Art of care)		Factor 3 (Amenities of care)	
	Beta	t	Beta	t	Beta	t
Socio-demographic variables						
Age	0.08	1.13	-0.11	-1.74 c	0.03	0.45
Gender	-0.14	-2.10 b	-0.03	-0.54	-0.10	-1.45
Nationality	-0.25	-3.77 a	0.20	3.34 a	-0.03	-0.44
Education	0.02	0.33	-0.06	-1.01	0.09	1.18
Income	-0.01	-0.16	0.43	7.25 a	-0.11	-1.53
Employment	-0.04	-0.66	0.09	1.49	-0.09	-1.22
Marital status	0.01	0.14	0.14	2.34 a	0.19	2.77 a
Distance from home	-0.04	-0.59	0.29	4.85 a	-0.06	-0.81
Predispositional variables						
Number of visits	-0.12	-1.83 c	-0.09	-1.60	-0.02	-0.31
Health status	0.09	1.56	-0.09	-1.64	0.01	0.20
Health concern	0.09	1.58	0.18	3.18 a	0.09	1.34
Continuity of care	-0.15	-2.56 a	0.02	0.30	-0.05	-0.75
Time to get appointment	0.25	4.15 a	0.08	1.49	0.16	2.41 a
Waiting time in clinic	0.09	1.63	-0.01	-0.17	0.03	0.48
Constant		0.29		1.93		0.68
R-square		0.28		0.38		0.17
Overall F-value		6.33 a		9.98 a		3.19 a

Note:

a = P<0.01

b = P<0.05

c = P<0.10

means that variance in the dependent variable (factor scores of technical care) cannot be explained by these non-significant variables.

Based on the t-test results, there is a statistically significant difference between males and females in terms of their satisfaction with technical quality of care ($P < 0.05$). The finding suggests that females tend to be less satisfied with technical quality.

The results also indicate that there is a statistically significant difference between Saudi and non-Saudi patients regarding their satisfaction with technical quality of care ($P < 0.01$). In other words, Saudi patients tend to be less satisfied with technical quality.

As expected, the beta of number of ambulatory visits has a negative sign indicating that the greater the number of visits the lower the level of patient's dissatisfaction. In other words, patients with greater number of ambulatory visits are more satisfied with the technical quality of care.

The beta coefficient for "continuity of care" is a statistically significant one ($P < 0.01$). This finding reveals that patients who reported that they have high continuity of care are more satisfied with technical care than patients who reported having no continuity of care.

As indicated in table 3, the variable "time to get appointment" is a dummy variable where zero means that time to get an appointment is very short and one means it takes very long to get an appointment. The beta coefficient of this variable is 0.25 and is significant at $P < 0.01$. This finding shows that patients who reported that it takes them long time to have appointments are more dissatisfied with technical quality of care than patients who reported the opposite.

With respect to the second regression model (factor 2: art of care), factor scores were used as the main dependent variable of art of care and were regressed on the same sociodemographic and predispositional variables.

The results indicate that the overall F-test for this model is significant yielding an F-value equal to 9.98. The R-square equals 0.38, which indicates that the independent variables jointly explain about 38 percent of the variance of the dependent variable.

Out of the same fourteen independent variables, there are only six that have statistically significant coefficients. They are age, nationality, family income, marital status, health concern and distance from home.

The findings show that older patients and Saudi patients are more satisfied with the art of care than younger patients and non-Saudi

patients. Also, the data indicate that patients who have a higher family income and patients who are not married (single) expressed their dissatisfaction with the art of care. Patients who live far from the hospital also expressed their dissatisfaction with the art of care. Patients were asked if they are concerned about their health. The finding indicates that patients who reported that they are concerned about their health are less satisfied with the art of care.

The third regression model is the factor scores of what has been called "amenities of care" regressed on the same independent variables.

The overall F-test of this model is significant, yielding an F-value that equals 3.19. The R-square equals 0.17, which indicates that the included independent variables explain about 17 percent of the variance of the dependent variable. Out of the fourteen independent variables, there are only two variables that have statistically significant coefficients. These are marital status and time to get an appointment. The findings indicate that patients who are not married (single), and patients who experienced long time to get appointments expressed their dissatisfaction with the amenities of care.

IX. DISCUSSION

As indicated earlier, the main objectives of this study were to determine the main dimensions of patient satisfaction and to identify major attributes influencing it. Since patient satisfaction was measured by including twenty-two statements about satisfaction, factor analysis with a varimax rotation method was performed to reduce and to generate factors that could be retained in the analysis.

The findings of factor analysis indicate that patient satisfaction is a multidimensional concept. Three underlying dimensions or factors were retained in the analysis as the three main dependent variables. Figure 2 represents the three main dimensions of patient satisfaction. These three factors have been called technical care, art of care and amenities of care. Factor scores of each of the three dependent variables have been regressed on the same sociodemographic and predispositional variables.

The findings show that out of the fourteen independent variables studied for their role in predicting patient satisfaction, ten variables were found to have a significant role (Table 4). It was found that these variables have unequal weights in exerting influences on patient satisfaction. The most important predictors of at least two out of the three dimensions of patient satisfaction are time to get an appointment, marital status and nationality.

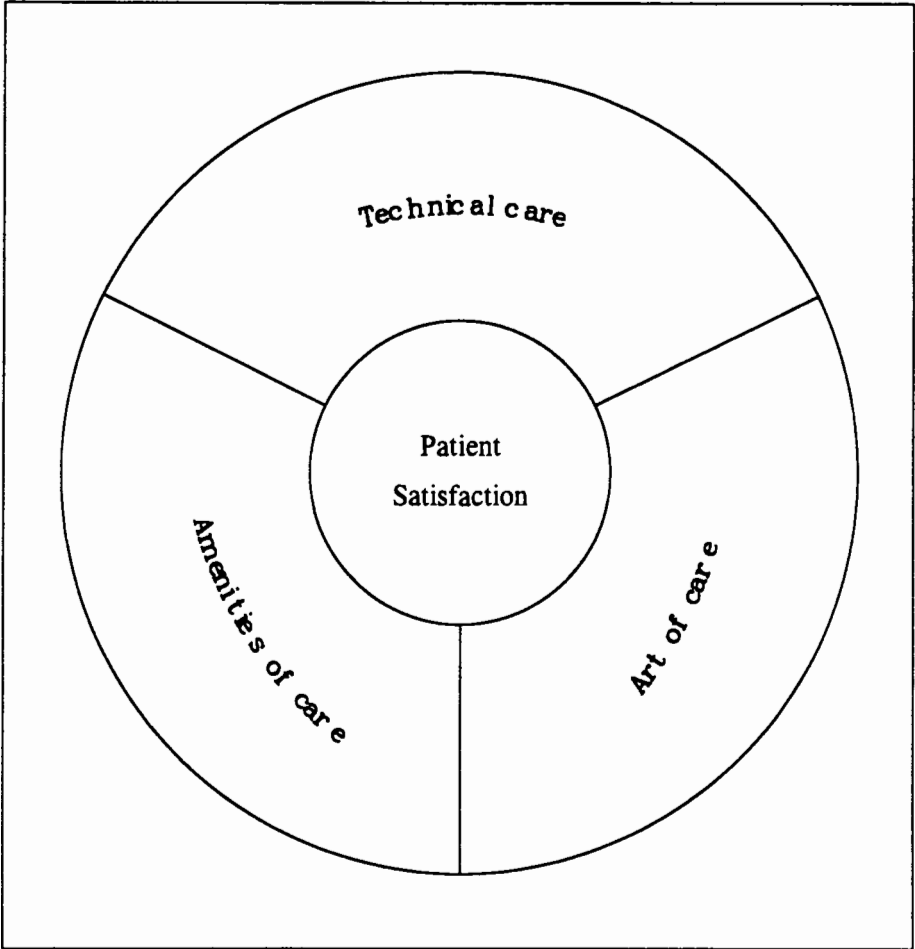


Figure 2. The Three Main Dimensions of Patient Satisfaction

The second important predictors are family income, distance from home, patient's health concern, continuity of care, number of ambulatory visits, patient's gender and his/her age. On the other hand, factors that were found to have non-significant roles are education, employment status, perceived health status and patient's waiting time in a physician's clinic.

The findings reveal that patients who experienced very long time to get appointments were less satisfied with technical quality but more satisfied with the art of care. At present, patients are seen on the basis of block appointment system, i.e., a group of patients will be given the same appointment time. It is suggested that the establishment of a computerized individual appointment system with a follow-up activity can decrease time to get an appointment and thus, the reluctance to come to the clinic. This together with a sound follow-up program should significantly improve the clinic's performance. As a result, it may increase patient satisfaction in all of its dimensions. This finding is consistent with expectation and it also supports the findings of Berkanovic and Marcus⁽⁶⁵⁾ and Penchansky and

(65) E. Berkanovic, A. C. Marcus, Satisfaction with Health Services: Some Policy Implications, Medical Care, Vol. 14, 1976, p. 873.

Thomas⁽⁶⁶⁾ as satisfaction with accommodation is lower for persons having to wait longer for an appointment.

Whereas, Bashshur et al⁽⁶⁷⁾ and Gerst and Hetherington⁽⁶⁸⁾ found married people to be more satisfied, the results of the present study indicate that patients who are single expressed high satisfaction with both art and amenities of care. With regard to patient's gender, the result also supports Gerst and Hetherington's⁽⁶⁹⁾ findings as males were somewhat more satisfied than females. Also, the finding of this study confirms expectations, i.e., it was expected to find males more satisfied since males in the Saudi society have more flexibility, power and prestige than females.

The findings reveal that Saudi patients are more satisfied with the art of care than non-Saudi patients, but Saudi patients tend to be less satisfied with technical quality. In general, Saudi patients perceive that health

(66) Roy Penchansky, J. W. Thomas, Op. cit., pp. 127-140.

(67) R. L. Bashshur, C. A. Metzner, C. Worden, Op. cit.

(68) A. L. Gerst, R. Hetherington, Op. cit., p. 37.

(69) Ibid.

facilities have been established to serve them at the first priority. Therefore, Saudi patients expect more professional personalized services. Also, Saudi patients, in general, have a bad image regarding teaching hospitals. Most of the Saudi patients who participated in this study perceive that teaching hospitals have less technical quality than other hospitals and the reason the Saudi patients cited was that teaching hospitals were established for education and training purposes. Therefore, patients will be examined by inexperienced individuals such as medical students and residents.

As expected, patients with high continuity of care and with greater number of visits tend to be more satisfied. This is consistent with the fact that patients in Saudi Arabia have many alternatives to enter the health care system, e.g., Ministry of Health, teaching hospitals and private hospitals. If patients are not satisfied, they can go to other health agencies. The findings of this study show that continuity of care and frequent visits to the same medical setting are significant predictors of high level of patient satisfaction. This finding is consistent with the findings of Hulka et al⁽⁷⁰⁾, Linn⁽⁷¹⁾, Marquis et al⁽⁷²⁾ and Linn et al⁽⁷³⁾.

(70) B. S. Hulka, S. J. Zyzanski, J. C. Cassel, S. J. Thompson, Op. cit., p. 661.

(71) Lawrence S. Linn, Op. cit., p. 531.

Younger patients, patients with higher family income, patients who live far from the hospital and patients who expressed high concern about their health were found to be statistically significant predictors of dissatisfaction with regard to art of care. With regard to patient's age, the result of this study confirms the findings of Pope⁽⁷⁴⁾, DiMatteo and Hays⁽⁷⁵⁾ and Linn and Greenfield⁽⁷⁶⁾, i.e., older patients are significantly more satisfied with care received.

Whereas Chaska et al⁽⁷⁷⁾ and Patrick et al⁽⁷⁸⁾ found that less patient satisfaction existed in the lowest income groupings, the result of this study indicates that less patient

(72) M. Susan Marquis, Allysson Ross Davies, John E. Ware, Jr., Op. cit., pp. 821-829.

(73) Margaret W. Linn, Bernard S. Linn, Shayna R. Stein, Op. cit., pp. 606-614.

(74) C. R. Pope, Op. cit., p. 44.

(75) M. R. DiMatteo, R. Hays, Op. cit., p. 18.

(76) Lawrence S. Linn, Sheldon Greenfield, Op. cit., pp. 425-431.

(77) N. L. Chaska, I. Krishan, R. K. Smoldt, et al., Op. cit., p. 44.

(78) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Op. cit., pp. 1062-1075.

satisfaction existed in the highest income groupings. As expected, patients who live far from the hospital tend to be less satisfied. This finding is also consistent with the findings of Penchansky and Thomas⁽⁷⁹⁾. The finding reveals that patients who expressed greater health concern tend to be less satisfied, which also supports the findings of Penchansky and Thomas⁽⁸⁰⁾. The results show that perceived health status is not a statistically significant predictor of patient satisfaction. This finding does not agree with the finding of Patrick et al⁽⁸¹⁾ and Linn and Greenfield⁽⁸²⁾.

X. CONCLUSIONS

Attention has been drawn to the importance of patient satisfaction. This is partly due to the belief that patient satisfaction is one of the aims of health care delivery and that satisfaction is an essential result of any transaction. Furthermore, until recently the Saudi Government has been concentrating on the development of health services infra-structure.

(79) Roy Penchansky, J. William Thomas, Op. cit., pp. 127-140.

(80) Ibid.

(81) Donald L. Patrick, Ellie Scrivens, John R. H. Charlton, Op. cit., pp. 1062-1075.

(82) Lawrence S. Linn, Sheldon Greenfield, Op. cit., pp. 425-431.

Having accomplished this task to a very large extent, attention has started to shift to health outcomes and other results. The Fourth Five-Year Plan (1985-1990) confirms the importance of evaluating the outcomes of health services to ensure that they operate with the greatest possible efficiency and effectiveness⁽⁸³⁾. Patient satisfaction is one of the desirable outcomes that the Saudi Government wants to achieve. Recognizing the importance of patient satisfaction, this paper aims to determine and analyze the main dimensions of patient satisfaction and identifying major factors exerting some influence on patient satisfaction, focusing on some sociodemographic and predispositional factors.

The results indicated that patient satisfaction is a multidimensional concept that is affected by different factors. It can also be seen that some results are consistent with previous findings, while others are not. This shows that findings cannot and should not be taken in general and absolute terms. This is because the data are usually limited by their subjective nature since satisfaction is relative, and is thus affected by existing conditions and the standards by which satisfaction is measured. At most, satisfaction measures can be an indication of the relative evaluation of conditions with the means of

(83) Ministry of Planning, Op. cit., p. 62.

measurement understood and acknowledged by the researchers.

It should also be noted that the factors considered in this study are only a set among the many variables that may influence patient satisfaction. For instance, other factors that may affect patient satisfaction are physicians' and nurses' satisfaction, employees' behavior, organizational structure and other related environmental variables. The present study does not cover these variables and therefore, it can be considered as a limitation of this study. It would be helpful towards a more comprehensive understanding of patient satisfaction that its other dimensions are looked into and taken into consideration.

One of the limitations of this study is that results are based on the perceptions of patients only. Also, results cannot be generalized to other healthcare organizations in Saudi Arabia due to the fact that this study was conducted only in teaching hospitals in the Riyadh region. The fact of the matter is that this study was undertaken because almost no systematic research has been conducted to examine the dimensions of patient satisfaction and to identify factors which influence patient satisfaction in Saudi health care system, particularly teaching hospitals. That is, little is actually known on the basis of solid empirical evidence about the magnitude of

measurement understood and acknowledged by the researchers.

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problems across health system. Therefore, it can be expected that more investigations in various cities involving larger populations and different professionals' perspectives should be conducted towards a better understanding of more reliable and valid measures of the main dimensions of patient satisfaction and potential factors contributing to high levels of patient satisfaction or dissatisfaction.

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