Assessment of the patient satisfaction for nuclear medicine services in Riyadh region

ABSTRACT
Nuclear medicine is considered mainly as one of the outpatient facilities that provide patients diagnostic services except for the therapy patients who may require isolation for a period away from other patients. For that reason, the patient's services within these units are varied widely and require more patient care techniques. The aim of the present study is to assess the patient satisfaction for the Nuclear Medicine Services in Riyadh region, Kingdom of Saudi Arabia. The study used the survey method for assessment of the patient satisfaction. The purpose of this survey was to gather meaningful opinions, comments, and feedback from patients visiting the nuclear medicine department in different hospitals. Statistical analysis was done for the survey output results to identify the area of strengths and the areas need more improvements. It was concluded that the politeness of the department employees, the privacy of the examination and guaranteed confidentiality of the treatment scored the highest satisfaction mean scores recorded by the patients. On the other hand, multiple appointment options, number of seats available in the waiting room, and cleanliness of the bathrooms had the lowest mean scores.

Keywords: Nuclear medicine, patient satisfaction, survey method

INTRODUCTION
Improving the quality of patient care in the Kingdom of Saudi Arabia (KSA) hospitals is a vital and necessary activity. Satisfaction measurement is part of a concept which is difficult to quantify or define. Many authors define it as a subjective concept aimed at relating the degree at which health-care services respond to the expectations of the patient or community.[1-2] The principal models of management such as the ISO standards[3] underline the importance of measuring satisfaction is a key dimension of health-care quality. Satisfaction questionnaires can be used for patients receiving healthcare when evaluating whether the management of the department and the efforts made to obtain good results.[4] Patients claim that they receive less individual attention than ever before. They complain that physicians and nurses are busy in performing the technical aspects of care providing the much-needed attention for patients' personal needs.[5] The business community has been involved in assessing the technical aspects of providing the much-needed attention for patients' personal needs.[5] The business community has been involved in assessing the customer satisfaction long time ago, but the medical community has lagged considerably in assessing patient satisfaction. Recent advances in the medical environment have encouraged the health-care profession to recognize patients as valuable customers. Different medical groups have been more involved in this process due primarily to major incentives from a payer driven to a patient-driven mode and also due to the increasing competition between hospitals and diagnostic centers arising from the diminished differences in the price of the services. Organizations in different countries do efforts in the collection of Health Plan Employer Data, and Information Set survey results have also affected the collection of patient satisfaction data in physician practices.[2]
There are many reasons why hospitals should evaluate patient satisfaction. It is unusual for those around us to give unsolicited criticism about the need for improvement. Most people when receiving poor service or bad food at a restaurant do not complain, they just warn their friends through a different method of communications and refuse to return. Hence, the health-care provider will be unaware of any problem and patients remain unsatisfied.[4]

Patient satisfaction is as important as other clinical health measures and is a primary means of measuring the effectiveness of health-care delivery. The current competitive environment has forced health-care organizations to focus on the patient satisfaction as a way to gain and maintain market share. If they do not know what their strengths and weaknesses are, so they cannot compete effectively.[5]

Patient’s experience in a hospital is based on numerous factors and experiences with a wide variety of individuals and facilities. The first to encounter is with the facility’s parking lot, followed by physically accessing the facility, the admissions process, encounters with physicians, nurses, and other service providers and their respective physical locations, including patient rooms and the care they receive while exciting in their room, and finally, the billing/payment process.[6] Other factors may include the cleanliness of the environment, the appearance of the facility, the ease of access to specific locations, the concern expressed from various staff and providers to the patient’s well-being, the waiting time they before getting care, the quality of the communications with providers, the outcome from the care provided, the cost of the visit, the efficiency in which care was delivered.[7] The interest to know the satisfaction of the users responds not only to a pattern in which the patients act as assessors of service quality but also their opinion serves as an indicator of the efficiency of the interventions or health-care activities.[8]

Previous studies have related to the service triangle of Haywood-Farmer, in which physical and process components, personal characteristics, and technical skills are being assessed.[10] This tool serves as an aid to classify services in a subjective manner and analyze quality management concerns on different service platforms. The contentment could be personnel oriented (emphasizing the friendly interaction between patient and personnel), yet it could be more process oriented (emphasizing the efficiency, speed, and smoothness of contact between patient and personnel).[11] The nature of services provided by nuclear medicine leads us to expect that the center of gravity of a nuclear medicine department will be on the side of the “physical and process” component and technical skills.[7,8] Several nuclear medicine departments provide the same types of services, but not the same quality of service and quality does not improve unless, it is measured and their consumption and production occur simultaneously.[12] In this context, service quality measurement in nuclear medicine facility has to be based on perceived quality rather than objective quality.[13]

**Aim of the study**

The aim of the present study is to assess the patient satisfaction for the Nuclear Medicine Services in Riyadh region, KSA.

**MATERIALS AND METHODS**

The study used the survey method for assessment of the patient satisfaction. The purpose of this survey was to gather meaningful opinions, comments, and feedback from patients visiting the nuclear medicine department in different hospitals. Participants were asked to complete a satisfaction-based questionnaire, composed of demographic-based questions (gender, age, education level, monthly income, employment status, nationality, and place of residence) and a range of questions related to the aim of the study. This validated questionnaire composed of 21 questions. Each questionnaire was divided into four sections – before the consultation, nuclear medicine department, comfort, and professionals. The questions covered topics of interest with the main theme of measuring the overall impression of patients on nuclear medicine departments.

The questionnaire consisted of Likert scale questions that have a range of discrete answers. Each respondent had to answer the questions through choosing from “strongly agree,” “agree,” “neutral,” “do not agree,” and “strongly disagree.” After assigning each answer its weight value, the mean value of each question for total sample size was calculated.

Based on the questionnaire data collected, an independent samples t-test was conducted comparing the means of two independent groups to determine whether there is a statistical evidence that the associated population of male and female answers is significantly different. The null hypothesis will be the means for both groups are equal versus the alternative hypothesis that the means are not equal (2-tailed).

Since the study independent variables were measured on a categorical scale, the Chi-square test will be used to measure the association with each of the outcomes. Subsequently, a post hoc analysis using the adjusted residual values will
be done to interpret a deeper inference on this significant association evidence. A significant association between measured variables and outcome will be examined using multinomial logistic regression at a significance level of 0.05. Building blocks model technique will be used, in which significantly associated variables will be applied to the model independently. Finally, a reliable model will be achieved that will help in statistical inference of the data.

SPSS software, version 23 (SPSS Inc., Chicago, Illinois, USA) was used for data entry and analysis. All analyses were carried out at a significance level of 0.05. Chi-square test was used for categorical variables, while continuous variables associations were examined using t-test.

Table 1: Illustrates demographic data collected from the participants and listed along with their frequencies and percentages

| Variable                  | Category          | Frequency (%) |
|---------------------------|-------------------|---------------|
| Gender                    | Male              | 85 (61.1)     |
|                           | Female            | 54 (38.8)     |
| Age                       | 20-30             | 0             |
|                           | 31-40             | 21 (15.1)     |
|                           | 41-50             | 29 (20.9)     |
|                           | 51-60             | 33 (23.7)     |
|                           | 60+               | 56 (40.3)     |
| Highest education level   | Primary school    | 12 (8.63)     |
|                           | Middle school     | 20 (14.4)     |
|                           | Secondary school  | 42 (30.2)     |
|                           | University degree | 53 (38.1)     |
|                           | Postgraduate studies | 12 (8.63) |
| Nationality               | Saudi             | 111 (79.8)    |
|                           | Non-Saudi         | 28 (20.1)     |
| Place of residency        | City              | 121 (87.1)    |
|                           | Village           | 9 (6.47)      |
|                           | Governorate       | 9 (6.47)      |
| Employment                | Employed          | 85 (61.2)     |
|                           | Unemployed        | 21 (15.5)     |
|                           | Retired           | 15 (10.8)     |
|                           | Student           | 18 (12.9)     |

RESULTS

A total of 139 participants (85 males and 54 females) were included in the study analysis. Table 1 illustrates demographic data collected from the participants and listed along with their frequencies and percentages.

Figure 1 illustrates the highest and lowest calculated mean scores for each of the 21 questions of the questionnaire. From this chart, it can be concluded that the politeness of the department employees, the privacy of the examination and guaranteed confidentiality of the treatment scored the highest satisfaction mean scores recorded by the patients (4.80, 4.70, and 4.70, respectively). On the other hand, multiple appointment options, number of seats available in the waiting room and cleanliness of the bathrooms had the lowest mean scores (3.70, 3.50, and 3.10, respectively). Further to note that the overall satisfaction mean was 4.2 (standard deviation 1.22), which is considered a fairly significant high score. This indicates that most of the patients were clearly satisfied with the studied nuclear medicine departments regarding their overall performance.

Figure 2 illustrates the mean scores for each of the questionnaire four sections. The final section regarding professional attitude toward patients scored the highest satisfaction (4.4). Stressing on the fact that patients are treated in a professional manner and are aware of the procedures and protocols of their treatment. It is also important to note that gender did not have any significant association with the patients’ scoring 4.4 in this section (\(P > 0.05\)).

When participants were asked about the politeness of the department employees 113 (81.2%) stated that they were totally satisfied. However, the majority were from high age groups, specifically speaking, between 50 and 60 years old. This also appeared to be statistically significant through the Chi-square test with a \(P = 0.0002\). Moreover, education
level had a significant effect on the participants' answers, as those of lower education levels had fewer satisfaction scores regarding the politeness of the department employees ($p = 0.0012$). Regarding privacy of examination, about 74% of the participants, who noted that they were totally satisfied. The remaining 26% managed to express their discomfort about the privacy of the examination. It is important to note that from this 26%, a significant contribution was made from lower education level and lower income groups ($p = 0.0001$ and 0.0032, respectively). On the other hand, about 68% of the female participants were not satisfied with the privacy of the examination; however, the figures did not account for any statistical significance ($p > 0.05$).

After asking the participants at what scale do they rate the confidentiality of the treatment a staggering 91% mentioned that they totally agree. Although the percentage is statistically high, it was expected that most of the participants were examined through a well-structured and technically designed medical producer that guarantees the confidentiality of patient records.

When asked about multiple appointment options, a large portion of participants (32.1%) said that they were not satisfied by this aspect. Age and education level had a confounding effect on this answer. As these variables’ age groups did not have consistent answers throughout the questionnaire. Furthermore, there were a majority of participants who did not have any idea about this option being provided by the hospital in advance.

Participants were asked about their insights on the cleanliness of the bathroom and number of available seating areas, 62 participants (44.6%) stated that the seating area requires extra care in terms of bathroom hygiene. A remarkable contribution of these answers was shared among highly educated and employed participants. As significant associations were recorded for bachelor’s degree holders and participants who are currently employed ($p = 0.0031$ and 0.001, respectively). Moreover, 54 of the participants (38.8%) were not satisfied with the available seats in the waiting area. This figure was significantly associated with lower education levels (secondary school), unemployment and lower age groups (below 40 years old) with $p$ values 0.001, 0.0001, and 0.021, respectively.

Finally, it was important to note that, neither place of residency nor nationality was included in the analysis for association with the proposed study outcome. Mainly because the majority of the study participants were Saudi nationals residing in cites as shown in the Table 1. Furthermore, using Chi-square test, gender did not have a significant association with the study outcomes ($p > 0.05$).

Using generalized linear regression model, each of the study independent variables; gender, age, education level, social status, monthly income, employment status, nationality and place of residence, was used as a predictor for different study outcomes. The significant results have revealed that an employed person who is above 40 years and holding a university degree is the most likely to be satisfied with his/her overall experience.

DISCUSSIONS

This study evaluates the knowledge and attitudes of patients toward the nuclear medicine department measures in different hospitals in Saudi Arabia. Not all factors were investigated due to the concerns that a larger number of items would reduce the response rate.$^{[1]1}$ In addition, there is evidence that self-reports may overestimate compliance with recommended factors. The results presented represent the opinions of Saudi patients performing nuclear medicine scans in Riyadh region. Whether such opinions would be widely held on a nationwide basis remains to be determined by conducting similar surveys in government and other newer private hospitals in Saudi Arabia. The study revealed an overall adequate knowledge for patients toward nuclear medicine department measure.

Ruiz-López et al.$^{[14]}$ studied assessment of the patient satisfaction with a Nuclear Medicine Service, through a cross-sectional descriptive study. The authors designed a self-applied questionnaire based on a questionnaire from a survey created by the National Health Service of the UK. The answers of 32 items were analyzed, these including four socio-demographic questions and one open question. The authors recorded the variables related to service quality and recorded them as “in accordance” and “not in accordance.” The validity of the questionnaire was measured using Cronbach’s alpha and determination ($R^2$) indexes. The authors used the $\chi^2$, Student’s $t$-test, ANOVA, and linear regression analysis statistical tests. The results show a total of 179 questionnaires (response rate: 36.6% and sampling error: 5.8%). The evaluation of general satisfaction and the recommendation of the NM Service obtained a mean score of 8.96 and 9.20 (1–10 scale) points, respectively. The most influential variable regarding general satisfaction was the general impression of the organization of the
service. The strong points of the service were courtesy, general organizational image, and cleanliness. The main areas for improvement were appointment change process and waiting list which is matching the results of our study. There were no significant differences regarding satisfaction due to the socio-demographic variables except for age. In the present study, the only measured demographic data were the sex of the patient, and it shows a non-significant difference result. The study of Ruiz-López et al. satisfaction survey shows that patients are satisfied with the Nuclear Medicine Service and that it is a useful tool to detect the strong points and areas for improvement of the Service from the user’s perspective and this also matches the results of our study in KSA.

CONCLUSIONS

In the present study, it was concluded that the politeness of the department employees, the privacy of the examination and guaranteed confidentiality of the treatment scored the highest satisfaction mean scores recorded by the patients. On the other hand, multiple appointment options, number of seats available in the waiting room and cleanliness of the bathrooms had the lowest mean scores. Further to note that the overall satisfaction mean was considered a high score and this indicates that most of the patients were clearly satisfied with the studied nuclear medicine departments regarding their overall performance.

The results presented indicate the opinion of Saudi patients attending the department in Riyadh. Whether such opinion would be widely held on a nationwide basis remains to be determined by conducting similar surveys in government and other newer private hospitals in Saudi Arabia. The results concluded that the patients are satisfied with the Nuclear Medicine Service and that it is a useful tool to detect the strong points and areas for improvement of the Service from the user’s perspective.

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Conflicts of interest
The authors declare no conflicts of interest.

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