

**DEVELOPMENT OF A RELIABLE AND VALIDATED
QUESTIONNAIRE COMPARING INDIAN AND NIGERIAN
HEALTH CARE SYSTEM IN THE CONTEXT OF MEDICAL
TOURISM**

Erhauyi Meshach Aiwerioghene¹

Maj Gen (Dr) Mahavir Singh²

Dr Puneeta Ajmera³

Dr. H.K.Satia⁴

Abstract

Healthcare developments and the cost of medical treatments have brought about travel of patients around the world to avail medical treatments in countries where it is affordable and the medical procedures are readily available. The objective of this study is aimed at designing a reliable and validated questionnaire to compare Indian health care and Nigerian healthcare in context of medical tourism. Attributes of Indian healthcare and Nigerian healthcare were derived from 50 International patients from Nigeria and through literature reviews to arrive at an 50 item questionnaire. Each of these items was evaluated on a five point Likert scale. Reliability of the questionnaire was calculated through cronbach's alpha using spss software version 20.0. The results of the analysis show that seventeen items were discarded resulting in a valid and reliable questionnaire. The Internal consistency of all the sections of the questionnaire together was 0.724 measured by cronbach's alpha with the help of spss software. The reliability coefficient of individual sections of the questionnaire (different subscales) was also calculated and the result

¹ Research Scholar, PhD, Hospital Administration, Amity University, Haryana, India

² Dean, Faculty of Health & Allied Sciences, Amity University Haryana, India

³ Assistant Professor-II, Amity Medical School, Amity University Haryana, India

⁴ Professor, Amity Medical School, Amity University Haryana, India

were 0.719, 0.807, 0.745 and 0.801 respectively. The Questionnaire underwent rigorous development, to ensure it had reliable and valid properties. This questionnaire is intended to help in comparing Indian and Nigerian health care system in the context of medical tourism.

Keywords— Healthcare developments, Reliability, Validity, item analysis, questionnaire, Internal consistency.

1. INTRODUCTION

Developed countries have a standardized healthcare system, and populations of such countries enjoy the best medical treatment available. Other developing countries such as Nigeria is still striving to achieve a standardized healthcare system. Over the years Indian corporate health care system have been revolutionized and have made a name for herself around the globe. Medical tourism has made it possible now for patients to travel far and wide to avail medical treatment in a country like India, which provide a standardized medical treatment at an affordable price. Medical tourism has resulted in a major boost in India economy.

A fast growing dimension of health care globalization is medical tourism, whereby patients choose to travel across borders or to overseas destinations to receive medical treatment. Such treatments include cosmetic and dental surgery; cardio, orthopedic and bariatric surgery; IVF treatment; and organ and tissue transplantation. Medical tourism is driven by high healthcare costs, long waiting periods, or lack of provision of new and standardized medical procedure in developing countries, most medical tourists (largely from Africa nations like Nigeria, Congo, Kenya etc.) seek care in India.

This article reports the development of a self administered questionnaire whose items is customized to cover every facet of medical tourism comparing Indian and Nigerian Healthcare system. In order to design reliable and validated questionnaire, we sorted the responses of Nigerian International patients in India in line with their possible difficulties faced in availing treatment both in Nigeria and India and their possible solutions. This questionnaire will serve as a good contributing factor for subsequent research in assessment of Indian and Nigerian

Healthcare system. Further, the reliability of the questionnaire was checked through cronbach's alpha using spss software 20.0.

1.1 Aim -To develop a valid and reliable self administered questionnaire to compare Indian and Nigerian health care system in the context of medical tourism.

1.2 Objectives

- To construct a conceptual framework for a self administered questionnaire in order determine the reasons behind Nigerian patients traveling to India.
- To elaborate and develop Important questions to address the nature of healthcare services provided by Corporate hospitals in India Hospitals In NCR region
- To formulate a preliminary questionnaire from the item pool of questions.
- To ensure proper reliability and validity of the questionnaire in order to further refine the questionnaire.
- To establish and construct a final valid and reliable questionnaire addressing key issues related to Indian and Nigerian Hospitals while treating International patients.

2. RESEARCH METHODS

A pilot study was done in four hospitals in NCR region in India in view of comparing Indian and Nigerian health care system in the context of medical tourism was calculated. The resulting questionnaire – Indian and Nigerian health care system in the context of medical tourism consisted of 50 questions and responses to each item were based on a Likert scale ranging from Strongly Disagree, Disagree, Can't Say, Agree, Strongly Agree. Responses of fifty subjects who all were international patient from Nigeria were analyzed so that a higher item score indicated a more favorable view. Each of 50 items received equal weight when summed to arrive at a total score. The total score can therefore be as low as 50 (least favorable) and as high as 250 (most favorable).

2.1 Questionnaire development

The questionnaire development process consisted of four steps

- (I). Preparation of scope and structure of questionnaire components
- (II). To elaborate the components of the questionnaire
- (III). Development of a preliminary questionnaire

- (IV). Pilot study for further evolution of preliminary questionnaire
- (V). Item analysis to refine the questionnaire
- (VI). Reliability of the questionnaire

Step I- Preparation of scope and structure of questionnaire components

Collection of data was done through extensive and in depth interviews of international patients from four hospitals in Delhi and NCR region as well as through detailed review of literature in order to have an in depth information about the different facets of a questionnaire. Expert opinion was also obtained through interviews of the hospital staff dealing with international patients who had a deep understanding of different attributes of medical tourism industry.

Step II – To elaborate the components of the questionnaire

On the basis of the data collected, content and items comparing Indian and Nigerian health care system in the context of medical tourism were identified on Likert scale which is a five point response scale ranging from Strongly Disagree, Disagree, Can't Say, Agree, Strongly Agree and an item pool of 50 questions was generated. The initial item pool was further reduced to 45 items and only clear, specific, important and non redundant components were conserved. Unambiguous and simple wording of responses and the components were given importance and such components were included. Questionnaire components were developed in such a way that the reliability and validity of the questionnaire are established.

Content validity refers to how precise an assessment or measurement tool taps into the various aspects of the specific construct in question. That is to say, do the questions really assess the construct in question, or are the responses of the person answering the questions influenced by other factors. The components of the questionnaire should cover essential and important aspects of strengths, weaknesses, opportunities and challenges of Indian and Nigerian health care system in the context of medical tourism.

Face validity is known as the relevance or transparency of a measuring instrument as they appear to test participators. In other words a measuring tool or a test is said to have face validity if it will

measure what it is supposed to measure. People who are expert in the relevant area and with the target group are usually the best judges of face validity.

In order to make sure face validity and content validity of the questionnaire, the item pool was evaluated by experts in international patient wings of Artemis Hospital, Max Hospital, Fortis Hospital and Apollo

Hospital having relevant experience in the target field. They were asked to examine the questionnaire with an item pool of 50 questions for accuracy, appropriateness and relevance measuring the strengths, weaknesses, opportunities and challenges comparing Indian and Nigerian health care system in the context of medical tourism. After the second review by the expert panel some changes were made on some items and second draft of questionnaire consisted of 45 questions. Changes in the questionnaire included editing of some questions, removing questions and framing of new questions.

Step III – Development of preliminary questionnaire

A self administered questionnaire was established comprising of 45 questions. The first page of the questionnaire included the title of the paper, demographic details of respondents. The 45 questions were put in random order within their respective sections in the questionnaire so as to prevent biasness in numbering and positioning of items in the questionnaire.

Step IV - Pilot study for further evolution of preliminary questionnaire

A pilot study was carried out to examine whether the questionnaire was compatible and appropriate in the target group i.e. the international patients from Nigeria. 50 such subjects were selected from Apollo Hospital, New Delhi, Artemis Hospital Gurgaon, Fortis Hospital Gurgaon and Max Hospital Delhi respond to different items of the questionnaire. The results were analyzed for internal consistency using spss software version 20.0 qualitatively and quantitatively by examining the respondent's comments on compatibility and interpretability of items, lack of important items and time used for completing the questionnaire.

Step V – Item analysis to refine the questionnaire

The objective of this step was to test the appropriateness of each component to be included in the questionnaire statistically known as item analysis.

Item analysis –refers to a statistical technique which is used for selecting and rejecting the items of the test on the basis of their difficulty value and discriminated power. Kline suggests that the items are not considered to be useful if they are answered correctly by less than 20% or more than 80% of respondents. In this research 2 items were answered correctly by more than 80% of the respondents and 1 item by less than 20% of the respondents. So these three (3) items were removed from the questionnaire.

Item discrimination – It is the ability of each individual item to discriminate between the people having different knowledge levels and was measured by correlating the score on each item with an overall test score using spss version 20.0. An item to total score correlation of 0.2 is said to be the cutoff point and the items less than 0.2 should be scrapped. Based on this criteria of item discrimination further two (2) items were excluded from the questionnaire.

Step VI - Reliability of the questionnaire

When the validity part was fulfilled and item analysis was done, the questionnaire was analyzed to assess its reliability, which is defined as the ability of a questionnaire to measure the consistency of an item/component and how effectively the items correlate with each other and fit together, conceptually

Internal consistency is the homogeneity of all the items on the questionnaire. This was measured by cronbach's alpha using spss software version 20.0. Cronbach α values range from 0 to 1 and a score of 0.7 or higher is acceptable. Cronbach alpha was calculated for the whole questionnaire, i.e. entire scale and for the different sections of the questionnaire, i.e. subscales.

3. RESULTS

3.1 Content validity

A score of four (4) or three (3) on CV index shows that the content is valid and is appropriate to the conceptual framework (Lynn 1996). E.G, if 3 of 5 experts rate an item as relevant (4 or 5) the content validity CVI would be $3/5=0.6$, but the level required is 0.8 (4/5), and indicates that the item should be discarded. Therefore, five items in the questionnaire were invalid because they yielded CVIs of $3/5=0.6$ to $2/5=0.4$ and were discarded from the questionnaire. The Rest of the items were valid with CVIs ranging from 0.8 (4/5) to 1.00 (5/5) and were retained in the questionnaire.

3.2 Face validity

The entire subjects rated each item at four or five on a Likert scale of 1-5. Ninety percent (90%) said they have understood all the questions thoroughly and found the questions easy to answer, and 95% indicated that the appearance and layout of the questionnaire would be suitable with the intended target population thus guarantee good face validity of the questionnaire.

3.3 Item analysis

During this process of development of questionnaire, 2 items were answered correctly by more than 80% of the respondents and 1 item by fewer than 20% of the respondents. So these three items were discarded from the questionnaire.

Item discrimination –This was measured by correlating the score on each item with an overall test score using spss version 20.0. An item to total score correlation of 0.2 is said to be the cutoff point below which items should be discarded. Based on this criteria further 2 items were discarded and hence a questionnaire with 40 items was developed.

Table 1

Table 1.1 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items

Table 1.1 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.533	.174	40

Table 1.2 Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	48.2600	29.258	-.021	.	.536
Q2	48.3800	28.567	.084	.	.530
Q3	48.3400	29.372	-.064	.	.545
Q4	48.2000	29.347	-.049	.	.536
Q5	48.3200	29.691	-.136	.	.545
Q6	48.5000	30.337	-.223	.	.561
Q7	48.2200	29.400	-.068	.	.537
Q8	49.6000	25.224	.478	.	.476
Q9	48.2200	29.481	-.099	.	.539
Q10	48.3200	28.263	.187	.	.522
Q11	48.4000	31.918	-.579	.	.580
Q12	48.2800	29.879	-.197	.	.547
Q13	48.5600	32.333	-.586	.	.588
Q14	48.4400	31.802	-.533	.	.579
Q15	48.2800	27.838	.318	.	.513

Q16	48.6600	33.331	-.692	.	.602
Q17	48.3200	29.855	-.155	.	.550
Q18	48.7200	33.838	-.771	.	.609
Q19	50.0000	28.735	.052	.	.533
Q20	48.3400	28.678	.072	.	.531
Q21	48.2800	29.308	-.046	.	.541
Q22	49.6800	25.447	.598	.	.473
Q23	49.7000	26.337	.439	.	.491
Q24	49.3000	22.541	.690	.	.423
Q25	49.8000	25.755	.668	.	.475
Q26	49.9800	29.122	-.014	.	.539
Q27	48.8800	25.047	.424	.	.479
Q28	48.9200	22.361	.661	.	.423
Q29	49.5400	28.417	.001	.	.549
Q30	48.5000	28.418	.045	.	.537
Q31	49.9200	28.238	.110	.	.528
Q32	49.3600	23.011	.629	.	.436
Q33	48.2400	29.860	-.219	.	.546
Q34	49.5000	26.949	.204	.	.515
Q35	50.0000	27.878	.324	.	.514
Q36	49.0000	21.592	.742	.	.403
Q37	49.9200	29.422	-.073	.	.545
Q38	48.3800	28.771	.036	.	.535
Q39	49.9800	29.489	-.086	.	.548
Q40	49.0000	21.592	.742	.	.403

3.4 Internal Reliability of questionnaire

In (Table 1) Reliability coefficient was then calculated using cronbach's alpha with spss version 20.0 and the result was 0.533 and seven items were further excluded from the questionnaire. At (Table 2) the questionnaire included 33 items. After item analysis, reliability coefficient was then calculated using cronbach's alpha with spss version 20.0 and the result was 0.724 which indicates a high correlation between items of the questionnaire and is reliable consistency. Furthermore, the reliability coefficient of the different individual sections of the questionnaire was calculated. In section one (Quality of Healthcare Service), section two (Infrastructure), section three (Visa Related Issues), section four (Political, Economical & Ethical Factor) all had a cronbach's alpha value of 0.719,0.807,0.745 and 0.801 respectively (Table 3)

Table 2

Table 2.1 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.724	.639	33

Table 2.2 Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	35.0200	47.408	.177	.	.721
Q2	35.6000	49.102	-.051	.	.737
Q3	35.2800	49.553	-.092	.	.739
Q4	35.2600	50.156	-.155	.	.740
Q5	35.0200	47.408	.177	.	.721
Q6	35.9600	48.692	.011	.	.729

Q7	35.0200	47.408	.177	.	.721
Q8	35.7000	47.316	.198	.	.719
Q9	34.7000	49.969	-.201	.	.732
Q10	34.7000	47.235	.333	.	.715
Q11	34.7400	48.360	.087	.	.724
Q12	35.1400	54.939	-.759	.	.763
Q13	34.7400	48.360	.087	.	.724
Q14	34.7400	48.360	.087	.	.724
Q15	34.7400	48.360	.087	.	.724
Q16	36.1000	44.622	.540	.	.701
Q17	36.1200	45.700	.398	.	.709
Q18	35.7200	40.247	.705	.	.677
Q19	36.2200	45.359	.544	.	.704
Q20	36.4000	49.061	-.022	.	.729
Q21	35.3000	42.786	.519	.	.696
Q22	35.9600	48.896	-.047	.	.741
Q23	34.9200	48.524	.011	.	.732
Q24	35.6800	40.059	.718	.	.676
Q25	35.4200	39.147	.740	.	.671
Q26	35.7800	40.175	.712	.	.677
Q27	34.6600	49.902	-.215	.	.731
Q28	35.9200	46.728	.163	.	.723
Q29	36.4200	47.881	.220	.	.719
Q30	36.3400	49.658	-.107	.	.733
Q31	35.4200	39.147	.740	.	.671
Q32	36.4000	48.531	.039	.	.727
Q33	35.4200	39.147	.740	.	.671

Table 3. Reliability Statistics for subscales/Individual sections of questionnaire comparing Indian and Nigerian health care system in the context of medical tourism

SUBSCALES	NO. OF ITEMS IN SUBSCALE	CRONBACH'S ALPHA
Quality of Healthcare Service	8	0.719
Infrastructure	7	0.807
Visa Related Issues	9	0.745
Political, Economical & Ethical Factor	9	0.801

4. DISCUSSION

With regards to this study, precise and careful observation was given to the development of questionnaire comparing Indian and Nigerian health care system in the context of medical tourism. The main purpose was to focus on the reliability and validity of the questionnaire. To ensure the content and face validity of the questionnaire and to select the best items in terms of clarity, accuracy and representativeness of items every draft of the questionnaire was thoroughly reviewed by a panel of experts. Some items were removed and some new items were added to the questionnaire with regards to the opinion and recommendation of the experts. In this study precise attention was made to ensure face validity of the questionnaire which was carried out by including and analyzing the discussion of all items and answers with experts and the respondents so that they can comment thoroughly on the design and impact of the questionnaire. The questionnaire initially consisted of 50 items, after content validity 5 items were removed. Further 3 items were deleted due to item difficulty index, and 2 items were also excluded due to item discrimination. Reliability of the remaining 40 items in the questionnaire was calculated by cronbach's alpha and its was 0.533. This resulted in excluding seven (7) more items and the final questionnaire included 33 items. The questionnaire was divided into four (4) sections which provide the opportunity to assess both the general and more specific information regarding Indian and Nigerian health care system in the context of medical tourism. Internal consistency for the questionnaire was calculated by cronbach's alpha. Cronbach's alpha was calculated for the questionnaire and it was 0.724 which indicates that there exists a high correlation between different components of the questionnaire and the questionnaire is considered to be consistently

reliable. In this study, since the measuring instrument consists of two or more than two subscales alpha was calculated for the entire scale as well as for the subscales. Since the questionnaire possesses four (4) subscales and therefore Cronbach's alpha was calculated for the four (4) subscales. Alpha calculated for the four subscales were more than 0.7, Which indicated that the questionnaire was reliable.

5. CONCLUSION AND IMPLICATIONS

In conclusion, the questionnaire has been designed to compare Indian and Nigerian health care system in the context of medical tourism. It was designed to find out the reasons why hospitals in India are favorable choice for most Nigerian patients as a destination for various medical procedures, what are the strengths of Indian hospitals compare to Nigerian hospitals, what are the healthcare opportunities available in Nigeria as far as medical tourism is concerned, what are the weaknesses of the Nigeria healthcare system and what can be the challenges India and Nigeria are facing in this sector. The questionnaire possesses good content and face validities, excellent reliability and therefore it should provide an important and useful tool for measuring the comparison between Indian and Nigerian healthcare system in the context of medical tourism. In recommendation for future research work, a convergent and discriminant validity can be calculated to evaluate the similarities and differences of questionnaire with other available tools measuring identical concepts. Confirmatory factor analysis can be done to add to the generalizability of the questionnaire. Notwithstanding, we believe that this questionnaire is a valid and reliable tool to measure the comparison between Indian and Nigerian health care system in the context of medical tourism.

QUESTIONNAIRE

COMPARING INDIAN AND NIGERIAN HEALTHCARE SYSTEM, IN CONTEXT TO MEDICAL TOURISM SECTOR

DEMOGRAPHIC DETAILS

1. Participant ID.....
2. Age/Gender.....
3. Native Country.....
4. Name of Hospital.....

5. Medical Diagnosis/Procedure.....

SECTION ONE

Quality of Healthcare Service

(Q1) Are you satisfied with the services provided by the hospital?

- Yes
- No
- Can't say

(Q2) Do you feel there are differences between the treatment facilities available in Indian and Nigerian hospitals?

- Yes
- No
- Can't say

(Q3) Do you agree that expert and skilled doctors and other healthcare staff are available in this Indian hospital?

- Yes
- No
- Can't say

(Q4) Are the Doctors in Nigeria are of the opinion that medical facilities in Indian hospital are better than in Nigerian hospitals?

- Yes
- No
- Can't say

(Q5) If you get the opportunity to advise other Nigerian patient to come to India for medical treatment will you?

- Yes
- No
- Can't say

(Q6) Are you satisfied with the quality of food available in this hospital in India?

- Yes
- No
- Can't say

(Q7) Are you satisfied with the services of nurses and other healthcare staff in this hospital in India?

- Yes
- No
- Can't say

(Q8) Are you satisfied with the staff response time?

- Yes
- No
- Can't say

SECTION TWO

Infrastructure

(Q9) Are you satisfied with the services provided by the auxiliary staff of this hospital?

- Yes
- No
- Can't say

(Q10) Do you think Nigerian hospitals need improvement in terms of infrastructure?

- Yes
- No
- Can't say

(Q11) Is the standard of medical equipment used for your treatment so far, better than what you have seen in Nigeria hospital?

- Yes

- No
- Can't say

(Q12) In a scale of 1-10 are Nigeria healthcare facilities above average, when compared to India healthcare from what you have experienced so far.

- Yes
- No
- Can't say

(Q13) From your observations so far in this hospital, do you think Nigerian Doctors lack knowledge or medical equipment and Infrastructure judging from your experience in the previous Referral Nigeria hospital.

- Yes (knowledge)
- No (medical equipment and Infrastructure.)
- Both

(Q14) Is clinical excellence and quality equipment available at this hospital?

- Yes
- No
- Can't say

(Q15) Was any transport facilities provided by the hospital to receive patient from airport in India?

- Yes
- No
- Can't say

SECTION THREE

Visa Related Issues

(Q16) Is medical visa processing in Nigeria difficult?

- Yes

- No
- Can't say

(Q17) Are you required to Register with FRRO on arrival in India?

- Yes
- No
- Can't say

(Q18) If yes to the Above question, was the registration process difficult?

- Yes
- No
- Can't say

(Q19) Was getting an Invitation Letter from the hospital difficult?

- Yes
- No
- Can't say

(Q20) Did you face any difficulty during the procurement of your visa at the Indian Embassy?

- Yes
- No
- Can't say

(Q21) Are you aware that your treatment in India is categorized under medical tourism?

- Yes
- No
- Can't say

(Q22) Was India your only option for medical treatment abroad?

- Yes
- No

- Can't say

(Q23) Would you rate the entire visa procurement process as easy?

- Yes
- No
- Can't say

(Q24) Do you feel that the government of India should introduce visa on arrival for medical tourists from Nigeria?

- Yes
- No
- Can't say

SECTION FOUR

Political, Economical & Ethical Factor

(Q25) Have you been sponsored for treatment by the Nigerian government?

- Yes
- No
- Can't say

(Q26) Will you say that government concern about the healthcare system in Nigeria is good?

- Yes
- No
- Can't say

(Q27) Do you think Nigerian government should take steps to improve the healthcare system in Nigeria?

- Yes
- No
- Can't say

(Q28) Did you compare the cost of treatment with other countries before embarking for India?

- Yes
- No
- Can't say

(Q29) How do you find the cost of treatment in India, is it expensive compared to developed countries like USA and UK?

- Yes
- No
- Can't say

(Q30) Do you feel the government is taking sufficient steps to improve healthcare in Nigeria?

- Yes
- No
- Can't say

(Q31) Do you feel the money being spent by patients abroad for medical treatment is affecting the Nigeria economy?

- Yes
- No
- Can't say

(Q32) If the Nigerian government takes sufficient steps to improve its healthcare system to international standard, will you still prefer to travel out for medical treatment.

- Yes
- No
- Can't say

(Q33) Apart from medical treatment, do you have plans to visit India's tourist locations?

- Yes
- No
- Can't say

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