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Impact of Facilities and Service Quality on Patient Relatives Satisfaction and Patronage in University of Maiduguri Teaching Hospital, Borno State, Nigeria

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Abstract. The study aimed at evaluating the impact of facilities and service quality in the University of Maiduguri Teaching Hospital. The study assesses the level of service quality and facilities provided to the patient's relative satisfaction and patronage. The study adopted a quantitative approach, and data were collected through a questionnaire survey from 225 patients relative to the UMTH proportionately selected from the target population in the Borno metropolis. The data collected were subjected to descriptive and inferential statistics with mean ranking, frequency distribution and Partial Least Square – Structural Equation Model (PLS-SEM) to achieve the research aim. The study indicated that service quality has the most potent effect on patronage, followed by satisfaction with a significant effect and facilities provided with a small size effect. The study also indicated hypothesised path relationship between service quality and patronage is statistically significant. The study reported that hypothesised path relationship between satisfaction and patronage is statistically significant. The study demonstrated that hypothesised path relationship between facilities provision and patronage is not statistically significant. It can be depicted that service quality and satisfaction are both moderately strong predictors of patronage, but facilities provision does not predict patronage directly. The study finally recommended that management intervenes through the provision of maintenance culture, enhancing the quality of services and facilities for satisfaction and patronage.

Keywords: patronage; service quality; facilities provision; hospital and satisfaction.

INTRODUCTION

The service sector is a rapidly growing area of the world economy, and health service organisations play a pivotal role in such development. Service quality is essential, especially in customer's retention. Customers have become quality conscious and expect all services to be of high quality. Competition plays a vital role in upgrading quality and patient's satisfaction in health care institutions. In environments where there is no competition significantly when demand exceeds supply, hospitals officer their patient's unsatisfactory service due to the idea that patients have no other alternative and they would comply with the present service unconditionally. Hospitals provide differentiation based on the quality of service. To have a consistent competitive advantage, service sectors like hospitals argue against providing excellent services to their customer.

To win today's market place entails building customer relationship and not just building the products; building customer relationship means delivering superior value over competitors to the target customers. Evaluating the company's service quality is mainly based on the customers; it

is evident that customers play essential roles in the organisational process. Whether an organisation provides good service quality or not will depend on the customers' feedback on the satisfaction they get from consuming the products since higher quality levels lead to higher customer satisfaction levels.

The organisation that focuses on customer satisfaction can build loyal clients who promote the organisation further through vital word of mouth advertising referrals. The private health care sector (including unqualified providers) also deserves scrutiny as 70 % of the patients seek medical care from this sector [15]. A study suggested that the overall utilisation rate for public health care service is as low as 30 %. Studies also maintain that public hospitals' service quality is better than private hospitals. Another study reveals that private hospitals' quality is better than in public health facilities. Furthermore, a lot of grievances regarding health care delivery have been directed towards government hospitals.

Literature review

Facilities are primarily physical, social, and institutional forms of capital, enhancing production, distribution, consumption activities, and ultimately, life quality. It constitutes essential services without which primary, secondary and tertiary productive activities cannot function. Facilities form the necessary ingredients for motivating people to be more productive and achieve relative self-reliance. In other words, facilities are elements in the package of basic needs which a community would like to procure for better living. It is viewed as those facilities and services that are needful to improve people's quality of life. Some authors put facilities to include the system of physical, human, and institutional forms of capital, enabling rural residents to perform their production, processing better, and distribution activities and improving the overall quality of life. Also, facilities can be better understood as specialised elements in the development process that bring about improvements in the masses' socio-economic welfare. Moreover, they are catalysts of development, and at the same time, their presence can be an indicator of the development level.

Some authors had assisted in categorising the facilities to include - economic such as credit, loan, production support; physical infrastructures such as roads, electricity, irrigation facilities; capacity building in terms of training, information dissemination; and support service namely, market services, and access to essential social services. Some researchers had attempted the classification of the facilities into three, namely, first: physical facilities consisting of roads, bridges, storage facilities, dams, irrigation, water facilities, and other forms of processing facilities. Second, social facilities such as health and medical facilities, educational facilities and third, institutional facilities consist of cooperative societies, farmers' unions, financial institutions like banks, agricultural extension and training services. This classification is of immense importance because people's socio-economic status largely depends on the quality of infrastructural facilities provided with good maintenance culture.

Moreover, the author [3] shared a similar opinion that the provision of basic facilities is a prerequisite for developing economies to stimulate economic growth and reach the state of economic recovery and poverty alleviation through increasing and diversifying agricultural outputs.

Also, authors [15, 24] observed that facilities are part of an integrated development strategy that combines various society areas, including agricultural, educational, health, nutrition, electrification, water supply and cooperatives simultaneously. The same vein had remarked that adequate facilities provision could reduce the production cost, affecting productivity, output, and employment.

Service quality has also been defined as customer perception of how well a service meets or exceeds its expectations. In defining service quality, some authors argue that it is a consumer's overall mental picture of the relative inferiority or superiority of the organisation and its services. Therefore, the service quality is interpreted as the impression of a customer's judgment concerning the service provided. Service quality is influenced by expected service and perceived service. If services are received as expected, the service quality is satisfactory. Still, if the services exceeded their expectations, customers will be delighted and perceive service quality as excellent and vice versa. Some authors refer to service quality focuses specifically on dimensions of service.

Some studies on service quality have been carried out in the health sector; however, no single definition can adequately delineate what health

is all about. The World Health Organization Constitution defines health as a complete physical, mental, social well-being and not merely the absence of disease or infirmity [36]. Also defined health care quality as the kind of care that is anticipated to maximise an inclusive measure of patient welfare after taking account of the process of care in all its parts [22]. Some authors define health care quality by underscoring the importance of life, stating that which consistently contributes to the betterment or maintenance of the quality or duration of life. They further highlight the relevance of disease prevention, health promotion, informed participation of patients and efficient use of resources as critical variables in healthcare quality. Highlights desired outcome consistent with professional knowledge. According to [31], it is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.

Some authors define quality considered the needs of patients and the financial resources of a facility; and argued that it is fully meeting the needs of those who need the service most, at the lowest cost to the organisation within bounds and directive of higher authorities and purchasers. According to [31], even though there are several definitions of healthcare service quality in literature, it is still a complicated and indistinct concept. Fuentes [4] concurs to [31] opinion by stating that the quality of healthcare service is a multidimensional concept that reflects a judgment about whether the services provided for patients were appropriate and whether the relationship between doctors and patients was proper. One of the traditional medical approaches to the definition of quality of healthcare focuses on healthcare services' outcome from the service provider's point of view. In contrast, another approach emphasises healthcare from the patient's perspective. In general, researchers define the quality of healthcare services along two dimensions; technical service and interpersonal care of service.

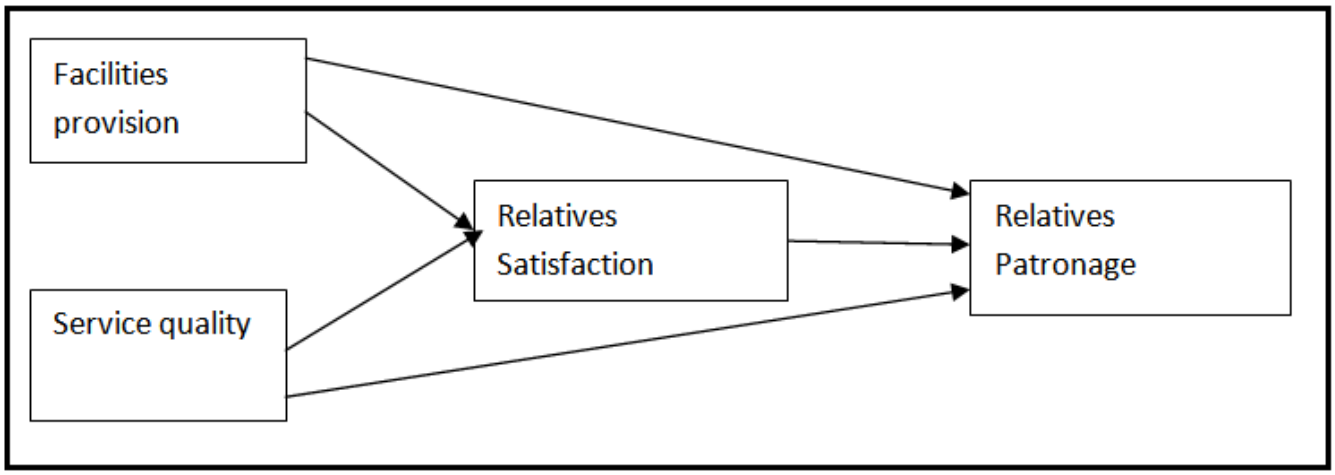

Figure 1 – Study conceptual framework

MATERIALS AND METHOD

The study population is the target respondents to the study that fulfil the requirement to supply information needed for the research. This study's target population are patient relatives in University Maiduguri Teaching Hospital (UMTH) who are staying with the patients.

The sample frame is the total number of target respondents. The sampling frame refers to a complete list of all units in the population under study and determines the inquiry structure. Some authors define a sample as "a proportion of a population". This study's sample frame is the total number of two patient relatives per 533-bed capacity, which are 1066.

The sample size is an essential feature of any empirical study in which the goal is to make inferences about a population from a sample. In practice, the sample size used in a study is determined based on the expense of data collection and the need to have sufficient statistical power. The sample size is 306 based on a sample frame of 1066 patient relatives. The sample size for this study was determined using Bartlett's table.

As the University Maiduguri Teaching Hospital comprises six (6) wards with a total bed capacity of 533, and since the hospital management al-

lowed only two (2) patients relative to stay with the patients (as presented in Table 1), the sample size will be proportionally assigned.

Table 1 – Demographics of the respondents

No	Attributes	Options	Frequency	Percentage
1	Gender	Male	110	48.9
		Female	115	51.1
			225	100
2	Age	Under 30 years	99	44.0
		30 to 60 years	94	41.8
		Above 60 years	32	14.2
			225	100
3	How often do you visit this hospital	Most of the time	57	25.3
		Some times	122	54.2
		First time	46	20.4
			225	100
4	Occupation	Civil servant	47	20.9
		Business	50	22.2
		Farmer	47	20.9
		Student	60	26.7
		None of the above	21	9.3
			225	100
5	Educational Qualification	Informal/ Primary Education	21	9.3
		Secondary certificate	86	38.2
		Diploma	98	43.6
		Degree	13	5.8
		Master degree and above	7	3.1
			225	100

The procedure for choosing the sample units from a population is known as sampling. While the study population may be finite or infinite, the sample is finite. There are various techniques for selecting units that make up the sample, categorised into probability and non-probability techniques. In respect of this study, a random sampling technique was used to collect unbiased data from each ward, while a purposeful sample was adopted to administer the questionnaire.

For this research, the questionnaire was adopted to collect data from the respondents in the study area. The design incorporated the use of only close-ended questions. The close-ended question had more than one response options and five (5) Likert scale used for the variables items to ease assessing the responses.

This study used structured questionnaires to generate quantitative data from the respondents. The study employed the use of descriptive statistic (Mean Ranking) and inferential statistic (Partial Least Squares (PLS)) to analyse the data collected. SPSS was used to analyse the data generated from the questionnaire survey.

Table 2 – Sample Frame and Sample Size

Ward/Dept.	Number of Bed (sample frame)	No. of Patients Relative (sample size)
Obstetrics and Gynaecology	136	57
Medicine`	141	60
Surgery	145	61
Paediatric Medical	88	37
Amenity	19	8
Intensive Care Unit	4	2
TOTAL	533	225

There are many kinds of validity, but they all refer to whether the data being measured truly reflects what it ought to be. Reliability refers to consistency and the ability to obtain the same answer each time a measure is used. There are three types of reliability test: inter-ratter, internal consistency, and test-retest. The validity test determines if a measurement truly reflects the concept being studied. There are three common types of validity: internal, external, and construct. Reliability test determines the consistency that researchers should obtain the same answer each time a measure is used. It is concerned with how consistent the result obtained with the instruments is. The instrument gives similar, close or the same result if the study is replicated under the same assumptions and conditions. The reliability of the constructs was analysed by finding Cronbach's alpha, as Pallant suggested. Overall, Cronbach's alpha for the questionnaire was 0.853. This means that the questionnaire as a whole is reliable and acceptable.

Table 3 – Reliability results

Constructs	Cronbach's Alpha	N of Items
Service quality	.848	13
Facilities provision	.853	13
Satisfaction	.842	13
Patronage	.674	5

The results presented in the table above indicated that the Cronbach's alphas obtained for each of the constructs, facilities provision having the highest score of 0.853 and the patronage having the lowest value of .674. However, all the results were above the acceptable range of 0.7 except for patronage.

RESULTS AND DISCUSSION

What is the level of service quality in University Maiduguri Teaching Hospital? Descriptive statistical analysis was used to explore service quality in the University of Maiduguri Teaching Hospital Borno State.

Table 4 shows the level of service quality in the University of Maiduguri Teaching Hospital.

Table 4 – Level of service quality

No	Variables	Mean	St. deviation	Ranking
1	Internet connectivity	3.22	1.154	1st
2	Hygiene services	2.90	1.111	2nd
3	Recreational services	2.88	1.126	3rd
4	Laundry services	2.86	1.125	4th
5	Security service	2.85	1.091	5th
6	Electricity supply	2.79	1.118	6th
7	Sales services	2.77	1.003	7th
8	Response service	2.72	1.041	8th
9	Transportation	2.63	.992	9th
10	Cleaning services	2.55	1.070	10th
11	Communication services	2.55	1.073	11th
12	Safety services	2.44	.972	12th
13	Water supply	2.22	1.057	13th

It shows that the service quality provided most, based on a five-point measurement scale, was Internet connectivity, with a mean score of 3.22 ranked 1st. In contrast, electricity with the mean value of 2.79 ranked 6th.

What is the level of facilities provided in the University of Maiduguri Teaching Hospital? A descriptive statistical analysis was used to identify the level of facilities provided in the Teaching Hospital.

Table 5 shows the level of facilities provided in the University of Maiduguri Teaching Hospital. It shows that the facilities provided most, based on the five-point measurement scale, were security services with a mean score of 3.05 ranked 1st.

Table 5 – Level of facilities provision

No	Variables	Mean	St. deviation	Ranking
1	Security service	3.05	1.205	1st
2	Recreational services	2.88	1.126	2nd
3	Electricity supply	2.83	1.068	3rd
4	Response service	2.82	1.068	4th
5	Communication services	2.81	1.045	5th
6	Internet connectivity	2.75	1.131	6th
7	Hygiene services	2.72	1.069	7th
8	Cleaning services	2.71	1.122	8th
9	Transportation	2.68	.974	9th
10	Sales services	2.64	1.082	10th
11	Laundry services	2.58	1.103	11th
12	Safety services	2.58	.984	12th
13	Water supply	2.26	1.075	13th

What is the level of patient relative satisfaction with facility provision and service quality in the study area? A descriptive statistical analysis was used to identify the level of satisfaction with the facility's facility in the University of Maiduguri Teaching Hospital.

Table 6 shows satisfaction with facility provision and service quality in the University of Maiduguri Teaching Hospital. It shows that the satisfaction with facility provision and service quality provided most, based on the five-point measurement scale, was security service with a mean score of 3.14 ranked 1st.

Table 6 – Level of facilities provision

No	Variables	Mean	St. deviation	Ranking
1	Security service	3.14	1.159	1st
2	Recreational services	2.96	1.070	2nd
3	Internet connectivity	2.86	1.137	3rd

No	Variables	Mean	St. deviation	Ranking
4	Response service	2.86	1.055	4th
5	Electricity supply	2.80	1.099	5th
6	Communication services	2.72	1.090	6th
7	Laundry services	2.71	1.181	7th
8	Transportation	2.68	1.021	8th
9	Hygiene services	2.67	1.100	9th
10	Cleaning services	2.66	1.086	10th
11	Safety services	2.53	.987	11th
12	Sales services	2.52	.973	12th
13	Water supply	2.23	1.029	13th

To what extent are patient relative willing to patronise the study area? A descriptive statistical analysis was used to identify the extent are patient relative willing to patronise.

Table 7 shows the level of patient relative patronage in the University of Maiduguri Teaching Hospital. It reported that willing to be visiting the hospital with a mean score of 2.91 ranked 1st.

Table 7 – Patient relative willing to patronise

No	Variables	Mean	St. Deviation	Ranking
1	Willing to be visiting the hospital	2.91	1.138	1st
2	Willing to recommend the hospital for people to come	2.76	1.078	2nd
3	Willingness to stay long outside the wards	2.76	1.085	3rd
4	Willing to invite your relatives and friends to visit the hospital	2.68	.997	4th
5	Willingness to stay long inside the wards	2.40	1.146	5th

What are Facilities Provision and service quality on patient's relative satisfaction and patronage in the study area? To determine the effect of facilities provisions and service quality on patient's relative's satisfaction and patronage in the study area, the Partial Least Squares-Structural Equation Modelling (PLS-SEM) was used.

Some authors suggested that some essential elements should be covered for an initial assessment of the PLS-SEM model.

These include an explanation of target endogenous variable variance, Inner model path coefficient sizes and significance, Outer model loadings and significance, Indicator reliability, Internal consistency reliability, Convergent validity, Discriminant validity and Checking the Structural Path Significance in Bootstrapping, which was presented below.

The convergent validity of the outer (measurement) models was assessed using the factor loadings, Average Variance Extracted (AVE) and composite reliability. Convergent validity was achieved whenever the factor loadings are high and statistically significant. The average variance extracted (AVE) is recommended to be above 0.5, while composite reliability is recommended to be above 0.6 [33]. The use of Average Variance Extracted (AVE) to measure the convergent validity ensures that each measurement model measures what is supposed to measure.

Table 8 – Average Variance Extracted (AVE)

Variables	Indicators	Factor Loadings	Cronbach's Alpha	Composite Reliability	AVE
Facilities provision	F1	0.763	0.814	0.866	0.519
	F2	0.800			
	F4	0.736			
	F8	0.626			
	F9	0.664			
	F13	0.763			
Service Quality	SQ1	0.725	0.837	0.877	0.507
	SQ2	0.771			
	SQ3	0.693			
	SQ4	0.767			
	SQ5	0.734			

Variables	Indicators	Factor Loadings	Cronbach's Alpha	Composite Reliability	AVE
	SQ7	0.638			
	SQ8	0.643			
Satisfaction	SFPH1	0.809	0.774	0.846	0.526
	SFPH2	0.751			
	SFPH3	0.698			
	SFPH4	0.705			
	SFPH5	0.652			
Patronage	WPH1	0.813	0.637	0.805	0.580
	WPH2	0.752			
	WPH3	0.717			

It can be seen that all of the indicators have individual indicator values that are much larger than the minimum acceptable level of 0.6 and close to the preferred level of 0.7. Cronbach's alpha is used to measure internal consistency reliability, but it tends to provide a conservative PLS-SEM measurement. Prior literature has suggested using "Composite Reliability" as a replacement [33]. Such values are shown to be larger than 0.6, so high internal consistency reliability levels have been demonstrated among all the constructs.

From table 8, it is found that all of the AVE values are greater than the acceptable threshold of 0.5, so convergent validity and reliability is confirmed.

The discriminant validity was assessed using the constructs' correlation and the constructs' cross-loadings. Some authors suggest that AVE's square root in each construct can be used to establish discriminant validity, as indicated in Table 9 below. The cross-loading among the constructs ensured that none of the constructs is loading more in another construct than itself [33].

As seen in table 8 Above, Facilities provision AVE is 0.519; hence its square root becomes 0.824. For service Quality, the AVE is 0.507, and its square roots are 0.761; for satisfaction, the AVE is 0.526, and its square root is 0.725 service quality on the other and has an AVE of 0.580, and its square roots are 0.712. The result shows that the highest correlation matrix was between Facilities provision and patronage 0.761. It further shows that none of the research constructs is cross-loading more on another construct than itself. It can be concluded that the discriminant validity is well established as the square roots of the AVE are more significant than the correlation values in their respective column and rows. Therefore, the model is suitable for Partial least squares (PLS) regression analysis.

Table 9 – Discriminant Validity

	Facilities provision	Patronage	Satis-faction	Service quality
Facilities provision	0.721			
Patronage	0.695	0.761		
Satisfaction	0.418	0.627	0.725	
Service Quality	0.682	0.553	0.691	0.712

The structural model assessed the effect of facilities provision and service quality on satisfaction and patronage in the study area using the smart PLS 3 interface shown in Figure 2.

The coefficient of determination, R^2, is 0.661 for the patronage endogenous latent variable. This means that the three latent variables (Facilities provision, service quality, and satisfaction) moderately explain 66.1% of the patronage variance. Facilities provision and service quality together explain 0.690, i.e. 69.0% of the variance of satisfaction.

The inner model suggests that:

1) Service quality has the most potent effect on patronage (0.471), followed by satisfaction (0.332) and facilities provision (0.060).

2) The hypothesised path relationship between service quality and patronage is statistically significant.

3) The hypothesised path relationship between satisfaction and patronage is statistically significant.

4) However, the hypothesised path relationship between facilities provision and patronage is not statistically significant. This is because its standardised path coefficient (0.060) is lower than 0.1.

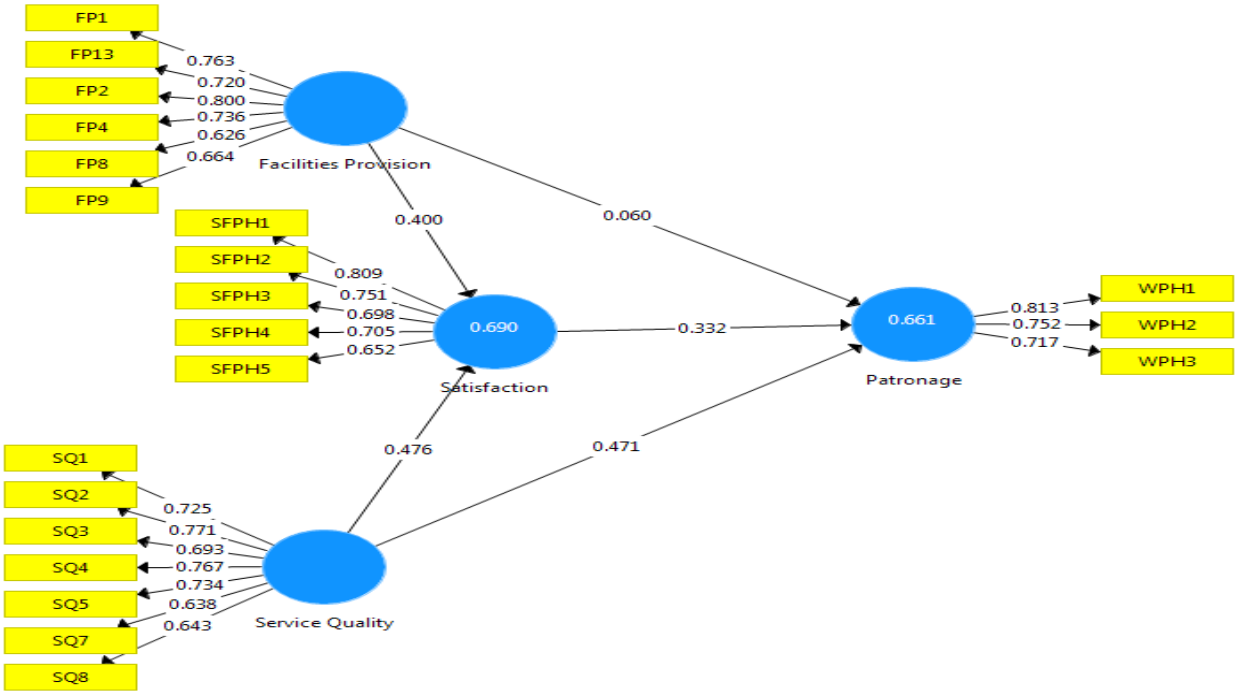

Figure 2 – Effect of Facilities provision and service quality on satisfaction and patronage

Thus, service quality and satisfaction are moderately strong predictors of patronage, but facilities provision does not directly predict patronage.

Figure 3 shows the t-statistics of each construct and indicator.

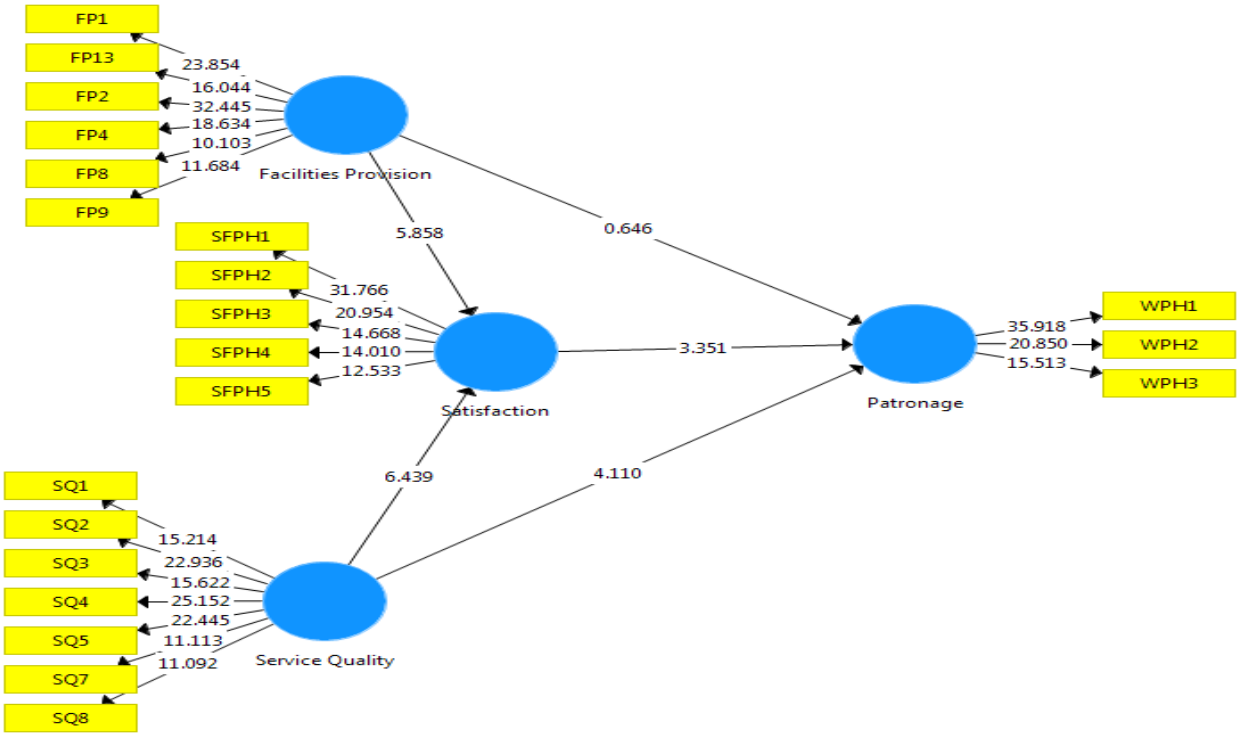

Figure 3 – T-statistics of path coefficients

The hypothesised relationship's statistical significance was assessed using a two-tailed t-test with a significance level of 5%. The result shows the effect of Facilities provision and service quality on satisfaction and patronage in the study area.

It can be seen that only "facilities provision – Patronage" linkage with t statistics of 0.646 is not significant because it indicated t-statistics below a minimum threshold of 1.96. However, all other path coefficients, i.e. "satisfaction- patronage linkage" with t-statistics of 3.351, "service quality – patronage" linkage with t-statistics of 4.110, "facilities provision – Satisfaction" linkage with t-statistics of 5.858, "service quality – Satisfaction" Linkage with t-statistics of 6.439 "satisfaction – Patronage".

Linkages with t-statistics of 3.351 in the inner model are statistically significant as it indicates t-statistics above the minimum threshold of 1.96.

Table 10 – t-statistics of path coefficient

	T-statistics
Facilities provision >Patronage	0.646
Facilities provision > satisfaction	5.585
Service quality> satisfaction	6.439
Service Quality > patronage	4.110
Satisfaction > Patronage	3.351

The t-statistics of each of the outer loadings in the structural equation modelling is presented in the table below.

Table 11 – t-statistics of outer loadings

	t-statistics
FP1	23.854
FP2	32.445
FP4	18.634
FP8	10.103
FP9	11.684
FP13	16.044
SQ1	15.214
SQ2	22.936
SQ3	15.622
SQ4	25.152
SQ5	22.445
SQ7	11.113
SQ8	11.092
SFPH1	31.766
SFPH2	20.954
SFPH3	14.668
SFPH4	14.010
SFPH5	12.533
WPH1	35.918
WPH2	20.850
WPH3	15.513

Table 11 shows the t-statistics of the external loadings indicating a value above the minimum threshold of 1.96.

CONCLUSION

It can be concluded that the most service quality in the University of Maiduguri Teaching Hospital were hygiene services, recreational services, laundry services and Security service, and the minor service quality was safety services and water supply. The significant facilities provided were security service, recreational services, electricity supply, response service, communication services and internet connectivity. The satisfied facilities provided were security service, recreational services, internet connectivity, response service, electricity supply, and most minor satisfying facilities. The study indicated that patient relatives were willing to visit the hospital, willing to recommend the hospital for people to come, and willing to stay long outside the wards. The study indicated that service quality has the most potent effect on patronage, followed by satisfaction with significant effect and small size effect facilities. The study also indicated hypothesised path relationship between service quality and patronage is statistically significant. The study reported that hypothesised path relationship between satisfaction and patronage is statistically significant. The study demonstrated that hypothesised path relationship between facilities provision and patronage is not statistically significant. It can be concluded that service quality and satisfaction are moderately strong predictors of patronage, but facilities provision does not directly predict patronage.

This study recommended that management intervenes through the provision of maintenance culture, enhancing the quality of services and facilities for satisfaction and patronage.

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