

ORIGINAL ARTICLE**Provider-Related Predictors of Utilization of University Health Services in Nigeria****Olumide ABIODUN^{*1, 2}, Faithman OVAT³, Oluwatosin OLU-ABIODUN⁴****OPEN ACCESS**

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ABSTRACT

BACKGROUND: *The utilization of health services is an important policy concern in most developing countries. Many staff and students do not utilize the health services within the university system despite the availability of good quality services. This study investigated the provider-related factors related to utilization of university health service by staff and students in a privately owned university in Nigeria.*

METHODS: *The perception of the quality of a university health service was investigated among a cross-section of 600 university staff and students who were selected by a stratified random sampling scheme. A self-administered questionnaire-based study was conducted. The structure, process and output predictors of utilization of the university health facility were assessed. Data analysis was carried out using Stata I/C 15.0.*

RESULTS: *The average age of the participants was 22.93±7.58 years. About two-thirds of them did not have opinion about the mortality and morbidity rates at the university health center. Significant proportions of the participants reported good perceptions about the structure and process quality of service indicators. Utilization of the university health center was predicted by some structure and process indicators namely; the availability/experience of staff (AOR 2.44; CI 1.67-3.58), the organization of healthcare (AOR 1.64; CI 1.11-2.41), the continuity of treatment (AOR 1.74; CI 1.12-2.70) and the waiting time (AOR 0.41; CI 0.28-0.61).*

CONCLUSION: *The utilization of university health services was predicted by availability/experience of staff, the organization of healthcare, the waiting time and the continuity of care. The structure-process-outcome approach discriminates between the students and staff who utilize the university health center and those who do not. It also suggests a complex interplay of factors in the prediction of choice of a health facility.*

KEYWORDS: *Health centre, predictors, quality of service, university*

INTRODUCTION

It is important for every community to have a ready and accessible healthcare facility to cater for the health needs of its members. However, beyond availability, utilization of the services is a major

determinant of a community's health status. It has been observed that despite the existence of University Health Services (UHS) in or around many university campuses, some staff and students still prefer to utilize other health services (1). Health service utilization simply is "the willingness of the would-be or potential patients to make the most of the services offered at a medical establishment" (2). The utilization of health services is an important policy concern in most developing countries, reflecting the efforts to improve client outcomes and to make health services broadly accessible (2). Although many policies and research initiatives have focused on the need to improve physical access (3,4), not enough is understood about the services and quality indicators that affect healthcare choices, and why low levels of utilization persist among certain socio-economic groups or geographic regions despite improved physical access (5).

Utilization of health services at a University Health Center (UHC) has implication for both the healthcare provider and the community members (staff and students of the university). First, in cases where the services are provided by university teaching hospitals an adequate patient flow is required along with a variety of cases for efficient training of doctors and medical students. In some university teaching hospitals in Nigeria, students and staff form a sizeable proportion of the patients seen at the hospital because of factors like location. Secondly, hospitals in developing countries receive income from patients' out of pocket payments (6). It is, therefore, important to ensure that the closest patients are diverted to the hospital for care. Utilization of a distant health facility may limit compliance with hospital patients from going for medical care, unless they run into health complications, or experience severe symptoms of illness which they feel are worth the trip to their preferred facility. Individuals may turn to self-medication when they cannot afford the journey to their preferred healthcare provider and do not wish to utilize the university health service (7,8). Lastly, in cases of emergencies, individuals who have to travel far to access care are at greater risk of mortality and severe complications than those who visit nearby facilities. Long travel to access healthcare is usually not desired (9).

It is assumed that choice of health service is straightforward with patients desiring high-

quality care at the cheapest rate, but it is actually the result of a complex interplay between patient and provider-related factors (8,10,11). Studies have identified various patient factors including economic status, the level of education plus cultural and religious factors (7,8,2,13). Studies have been conducted to examine various provider-related factors. Cost, geographical access, availability of information, acceptability and quality are some of the factors that have been identified (8,10). However, many of those studies have assessed aspects of provider characteristics not in a holistic manner. Besides, the studies have generally originated from western countries and have been applied to the utilization of university health center by staff and students of the university (14,15).

The aim of this study was to determine the provider-related factors related to the utilization of university health services by staff and students in a privately owned university in the Southwest, Nigeria.

MATERIALS AND METHODS

Study design and location: A cross-sectional study was carried out at Babcock University between September and October 2016.

Study population: The target populations for this study were the staff and students of Babcock University. Babcock University is a private faith-based co-educational Nigerian university, one of 61 private universities in Nigeria (16), and the only university in Nigeria owned and operated by the Seventh-day Adventist Church in the country (17). The university is located in Ilisan-Remo, Ikenne local government, Ogun State, Nigeria. It is situated off the Lagos-Ibadan expressway, equidistance between both cities. During the study, the university's total population was estimated to be about 10,103 students, 1250 academic and 1390 non-academic staff. Babcock has nine schools and one college. Most of the university's students reside on campus, in 8 male and 9 female halls of residence with about 55% of its student population being females. The university compound has staff quarters on campus, where full-time staffs, who form the majority of the staff population, reside. The university also has a teaching hospital on campus, and a health service insurance scheme with a fixed amount paid for services through school fees, per session by students, and periodic deductions from staff

salaries. The university health services are provided in this single center which comprises emergency unit, general out-patient department and all surgical and medical subspecialty units.

Sampling: The sample size was calculated using the formulae for estimating prevalence in a descriptive study where study population is more than 10,000 (18) based on a prevalence of 50.0% and a desired level of precision of $\pm 5\%$ at a confidence level of 95%. After 10% adjustment for non-response, the calculated sample size was 422. A total of 700 participants were, however, recruited for the study to improve validity of our study. The sample size was proportionally allocated to the various groups of participants. Systematic random sampling technique was used to select 550 students, 75 academic and 75 non-academic staff.

All full-time staffs of Babcock University and all duly registered students of the University in the 2016/2017 academic session were eligible to participate in the study. Part-time, visiting and contract staffs were excluded from the study. A systematic random sampling scheme was used to select participants from the list of students and staff obtained from the university registry after obtaining necessary permission. The students' list was ordered according to the year of admission into the university and a sampling fraction of 1 out every 18 was used to select the participants.

Conceptual framework: This study is based on the assumption that people are rational in their thinking and, therefore, their choice of a health facility is based on the information or their perception of quality of services. Quality indicators have been developed. A quality indicator is defined as "a measurable aspect of care that gives an indication of the quality of care" (19). The types of quality indicator have been identified. Structure indicators are those that relate to the organization of healthcare; process indicators relate to the process of delivery of healthcare while outcome indicators relate to the effects of delivered care (20,21,22). A scoping review of 101 studies (searched from Embase, Medline and PubMed) that assessed the influence of provider characteristics on patients' choice of health facility identified various

factors (14). The factors were summarized using the structure-process-outcome model of healthcare which forms the basis of the current study (14,21). Seven structure, 5 process and 2 outcome indicators were thus assessed. The assessment was done by asking participants to respond to one or more statements under each indicator which assessed their perception of the quality of health services at the university health centre. A 5-point Likert scale was used to indicate the participants' agreement. A score of 5 was awarded for 'strongly agree'; 4 for 'agree'; 3 for 'I don't know'; 2 for disagree; and 1 for 'strongly disagree'. Mean scores were calculated for each indicator, and participants were categorized as having 'good' or 'poor' perception based on having mean scores >3 or ≤ 3 respectively (Table).

Study instruments and validation: Self-administered questionnaire was used for data collection. The instrument is a 55-item questionnaire with two sections. The first section assessed the socio-demographic characteristics of the participants. The second section assessed the participants' perception of the quality of services provided by the university's health service as outlined above. The questionnaire was hand-delivered to the selected participants by trained research assistants. The participants were given some privacy for 20 minutes for completion. All copies of the questionnaire were retrieved on the same day by the investigators. A maximum of three attempts were made to get selected participants to fill out the questionnaire whenever difficulties were encountered. The questionnaire was pre-tested with 60 students and 10 staff of Olabisi Onabanjo University, Ago-Iwoye, and necessary adjustments were made. The questionnaire was created by two healthservice utilization experts after a thorough literature review and was then validated by another three other content experts. The experts agreed that the questionnaire was suitable and clear enough for use in the context of this study. Initially, fifty university students were made to complete the questionnaire twice at two

Table1: List of items for evaluation quality of university health services

Indicator category	Indicator	No of items	Items	
Structure	Availability of provider	1	There are few available options for me to receive healthcare	
	Accessibility of provider	2	The UHC is not far for staff and students The location of the UHC is convenient for staff and students	
	Type and size of provider	3	The UHC is better than Public/Government owned hospitals The UHC offers more services than most General hospitals The UHC is preferable to smaller hospitals	
	Availability/experience of the staff	4	The Physicians at the UHC are highly qualified The health workers at the UHC are quite experienced The UHC has the specialists that I often require The ratio of health workers to patients at the UHC is adequate	
	Organization of health care	3	The UHS is organized such that it can be accessed at any time it is required The UHS is organized such that services can be accessed anywhere it is required The UHS is organized such that Patients are able to be attended to by doctors of their choice	
	Cost of treatment	3	The UHC has agreements with health insurance companies Patients don't necessarily have to pay for services out of pocket at the UHC Cost of care is not a major concern at the UHC	
	Socio-demographic factors	2	The University health services are gender sensitive The Physicians at the UHC are advanced in age	
	Process	Interpersonal factors	4	The Physicians at the UHC are friendly and understanding The Physicians at the UHC usually listen to Patients At the UHC, Patients are carried along in decision making The atmosphere at the University health centre is friendly
		Availability of information	2	Information about the UHC is readily and continually available Patients are regularly updated with relevant information about their health at the UHC
		Continuity of treatment	1	Patients are able to keep seeing the same Physician/Physician in the same subspecialty at the UHC
Waiting time		2	At the UHC, waiting time to see Physician is quite appropriate The total time spent to access care on any visit to the at the UHC is appropriate	
Quality of treatment		4	Medical care offered at the UHC is of good quality Patients are usually given an idea of the care plan at the UHC Patient Care at the UHC is usually as agreed with the patient At the UHC different Physicians usually collaborate to provide care for Patients	
Outcome		Mortality rate		The rate of death at the UHC is acceptable considering the types of Patients seen
		Morbidity rate		The rate at which complications occur at the UHC is acceptable considering the types of Patients seen

weeks' interval. The test-retest reliability for each of the domains tested (structure: 0.92; process 0.81; output: 0.85), and their internal consistencies (structure: 0.83; process 0.80; output: 0.86) were good. The overall results of test-retest reliability and internal consistency were also good (test-retest *reliability* = 0.84, $p < 0.001$; Cronbach alpha = 0.82).

Measures: The outcome variable was the utilization of the university health services. This was assessed by asking the question, "When you are ill, where do you go to receive healthcare?" This was then categorized into those who utilized the university health center and those who did not (those who utilized health facilities outside the university). The independent variables were the perception of the UHC as it relates to the quality indicators stated above.

Data management: Data were screened and entered into a computer. Data analysis was carried out using Stata I/C 15.0. Data were summarized using counts, proportions and relevant summary statistics. Data were presented in tables. Inferential statistics, the chi-square test, was used to determine the association between participants' perception about the quality of care and utilization of the university health services. Multi-variate logistic regression analysis was then carried out on the variables to determine the predictors of utilization of UHS. The level of significance was set at 0.05. Backward elimination technique was used to build the best model to predict the utilization of UHS.

Six hundred and seven copies of the questionnaire were returned. This gave an overall response rate of 85.7%. The disaggregated response rates were 90.9% for students, 74.7% for non-academic staff and 58.7% for academic staff. Seven of the copies

had missing data and were deleted list-wise. Six hundred copies were thus analyzed.

RESULTS

Table 2 shows the socio-demographic characteristics of the participants disaggregated by occupation group. The age of the respondents ranged from 15 to 67 years and had a mean of 22.93 (± 7.58) years. The median age was 20 years with an interquartile range of 16 to 50 years and a kurtosis of 6.70. The participants were predominantly females (57.5%), except among academic staff where there was male predominance (59.1%). They were mainly Yoruba (60.0%), Christians (97.2%), and most of the staff were married while the majority (98.6%) of the students were single. The median number of years spent in the university was 3 years with an interquartile range of 1 to 22 years and a kurtosis of 32.05. About 70% of the respondents utilized the university health services when they required medical attention.

Table 3 shows the participants' perception of the quality of the university health services. About two-thirds of the participants did not have any opinion about the mortality and morbidity rates at the university health center. Indeed, significant proportions (20.7% to 66.5%) of the participants responded with 'I don't know' to most of the quality indicators for the university health services. Significant proportions (20.5% to 68.2%) of the participants reported good perceptions about availability, accessibility, type and number of providers, availability and experience of staff, organization of health care and cost of treatment. A sizeable proportion of them also reported good perceptions about interpersonal factors (62.9%), availability of information to patients (46.5) and quality of treatment (64.0%). However, more participants were dissatisfied (50.0%) with the waiting time than those who were satisfied (28.2%).

Table 2: Socio-demographic characteristics of participants

Characteristics	All participants	Students	Academic staff	Nonacademic staff
	n (%)	n (%)	n (%)	n (%)
Age				
15-19	257 (42.8)	257(51.4)	0 (0.0)	0 (0.0)
20-24	185 (30.8)	183(36.6)	0 (0.0)	2 (3.6)
25-29	59 (9.8)	46 (9.2)	4 (9.1)	9 (16.1)
30-34	28 (4.7)	6 (1.2)	11 (25.0)	11 (19.6)
≥35	71 (11.8)	8 (1.6)	29 (65.9)	34 (60.7)
Sex				
Male	255 (42.5)	199(39.8)	26 (59.1)	30 (53.6)
Female	345 (57.5)	301(60.2)	18 (40.9)	26 (46.4)
Religion				
Christianity	583 (97.2)	484(96.8)	43 (97.7)	56 (100.0)
Islam	17 (2.8)	16 (3.2)	1 (2.3)	0 (0.0)
Ethnicity				
Yoruba	360 (60.0)	289(57.8)	32 (72.7)	39 (69.6)
Igbo	123 (20.5)	108(21.6)	6 (13.6)	9 (16.1)
Ibibio	26 (4.3)	24 (4.8)	0 (0.0)	2 (3.6)
Edo	30 (5.0)	28 (5.6)	2 (4.5)	0 (0.0)
Others [#]	61 (10.2)	51 (10.2)	4 (9.1)	6 (10.7)
Marital status				
Married	85 (14.2)	7 (1.4)	37 (84.1)	41 (73.2)
Single	515 (85.8)	493(98.6)	7 (15.9)	15 (26.8)
Highest level of education completed				
Secondary school	426 (71.0)	423(84.6)	0 (0.0)	3 (5.4)
Bachelor's degree	83 (13.8)	53 (10.6)	0 (0.0)	30 (53.6)
Master's degree	67 (11.2)	24 (4.8)	26 (59.1)	17 (30.4)
PhD	24 (4.0)	0 (0.0)	18 (40.9)	6 (10.7)
Number of years in the University				
1 to 2	261 (43.5)	261(52.2)	0 (0.0)	0 (0.0)
3 to 4	220 (36.7)	192(38.4)	17 (38.6)	11 (19.6)
5 to 6	67 (11.2)	37 (7.4)	13 (29.5)	17 (30.4)
>6	52 (8.7)	10 (2.0)	14 (31.8)	28 (50.0)
Utilization of University Health services				
Yes	416 (69.3)	337(67.4)	34 (77.3)	45 (80.4)
No	184 (30.7)	163(32.6)	10 (22.7)	11 (19.6)

[#]Hausa, Itsekiri, Urhobo, Fula

Table 3: Perception about the quality of university health services

Provider-related quality indices	Strongly disagree	Disagree	I don't know	Agree	Strongly agree
Availability of providers					
There are few available options for me to receive healthcare	93 (15.5)	99 (16.5)	139 (23.2)	203(33.8)	66 (11.0)
Accessibility of providers.					
The UHC is not far for staff and students	73 (12.2)	125(20.8)	64 (10.7)	244(40.7)	94 (15.7)
The location of the UHC is convenient for staff and students	60 (10.0)	135(22.5)	108 (18.0)	216(36.0)	81 (13.5)
Type and size of providers					
The UHC is better than Public/Government owned hospitals	59 (9.8)	88 (14.7)	152 (25.3)	207(34.5)	94 (15.7)
The UHC offers more services than most General hospitals	49 (8.2)	111(18.5)	188 (31.3)	197(32.8)	55 (9.2)
The UHC is preferable to smaller hospitals	27 (4.5)	61 (10.2)	103 (17.2)	279(46.5)	130 (21.7)
Availability/experience of the staff					
The Physicians at the UHC are highly qualified	32 (5.3)	42 (7.0)	234 (39.0)	246(41.0)	46 (7.7)
The health workers at the UHC are quite experienced	36 (6.0)	53 (8.8)	220 (36.7)	254(42.3)	37 (6.2)
The UHC has the specialists that I often require	36 (6.0)	93 (15.5)	210 (35.0)	215 35.8)	46 (7.7)
The ratio of health workers to patients at the UHC is adequate	72 (12.0)	111(18.5)	206 (34.3)	185(30.8)	26 (4.3)
The organization of health care					
The UHS is organized such that it can be accessed at any time it is required	35 (5.8)	95 (15.8)	108 (18.0)	294(49.0)	68 (11.3)
The UHS is organized such that services can be accessed anywhere it is required	48 (8.0)	142(23.7)	206 (34.3)	176(29.3)	28 (4.7)
The UHS is organized such that Patients are able to be attended to by doctors of their choice	91 (15.2)	156(26.0)	206 (34.3)	120(20.0)	27 (4.5)
The cost of treatment					
The UHC has agreements with health insurance companies	18 (3.0)	26 (4.3)	433 (72.2)	96 (16.0)	27 (4.5)
Patients don't necessarily have to pay for services out of pocket at the UHC	62 (10.3)	64 (10.7)	211 (35.2)	212(35.3)	51 (8.5)
Cost of care is not a major concern at the UHC	113 (18.8)	127(21.1)	183 (30.5)	148(24.7)	29 (4.8)
Socio-demographic factors of the individual doctors					
The University health services are gender sensitive	40 (6.7)	128(21.3)	259 (43.2)	153(25.5)	20 (3.3)
The Physicians at the UHC are advanced in age	21 (3.5)	179(29.8)	248 (41.3)	144(24.0)	8 (1.3)
Interpersonal factors					
The Physicians at the UHC are friendly and understanding	43 (7.2)	74 (12.3)	106 (17.7)	328(54.7)	49 (8.2)
The Physicians at the UHC usually listen to Patients	33 (5.5)	38 (6.3)	102 (17.0)	355(59.2)	72 (12.0)
At the UHC, Patients are carried along in decision making	36 (6.0)	79 (13.2)	175 (29.2)	268(44.7)	42 (7.0)
The atmosphere at the University health centre is friendly	47 (7.8)	81 (13.5)	96 (16.0)	310(51.7)	66 (11.0)

Table 3 continued...

Availability of information					
Information about the UHC is readily and continually available	31 (5.2)	74 (12.3)	216 (36.0)	237(39.5)	42 (7.0)
Patients are regularly updated with relevant information about their health at the UHC	54 (9.0)	101(16.8)	197 (32.8)	218(36.3)	30 (5.0)
Continuity of treatment					
Patients are able to keep seeing the same Physician at the UHC	46 (7.7)	117(19.5)	261 (43.5)	156(26.0)	20 (3.3)
Waiting time					
At the UHC, waiting time to see Physician is quite appropriate	151 (25.2)	149(24.8)	125 (20.8)	152(25.3)	23 (3.8)
The total time spent to access care on any visit to the at the University health centre is appropriate	111 (18.5)	164(27.3)	111 (18.5)	190(31.7)	24 (4.0)
Quality of treatment					
Medical care offered at the UHC is of good quality	40 (6.7)	53 (8.8)	123 (20.5)	328(54.7)	56 (9.3)
Patients are usually given an idea of the care plan at the UHC	33 (5.5)	64 (10.7)	200 (33.3)	263(43.8)	40 (6.7)
Patient Care at the UHC is usually as agreed with the patient	39 (6.5)	76 (12.7)	234 (39.0)	217(36.2)	34 (5.7)
At the UHC different Physicians usually collaborate to provide care for Patients	30 (5.0)	52 (8.7)	230 (38.3)	233(38.8)	55 (9.2)
Mortality rate					
The rate of death at the UHC is acceptable considering the types of Patients seen	56 (9.3)	41 (6.8)	399 (66.5)	86 (14.3)	18 (3.0)
Morbidity rate					
The rate at which complications occur at the UHC is acceptable considering the types of Patients seen	51 (8.5)	48 (8.0)	396 (66.0)	86 (14.3)	19 (3.2)

Table 4 shows the relationship between the participants' perception of the quality and utilization of the university health services. Three structure and four process indicators showed a statistically significant relationship with the utilization of the university health services ($P < 0.05$). The structure (quality) indicators were availability and experience of staff ($P < 0.001$), organization of healthcare ($P < 0.001$) and cost of treatment ($P = 0.039$). The process indicators were the availability of information to patients ($P = 0.006$, continuity of treatment ($P < 0.001$), waiting time ($P < 0.001$) and quality of treatment ($P < 0.001$). The two outcome quality measures that were assessed did not show a statistically significant relationship with the utilization of the UHS ($P > 0.05$). When all the quality indicators were fitted into a multivariate logistic regression to control for confounders and predict the utilization of UHS, two structure (availability/experience of staff

and the organization of healthcare) and two process (interpersonal factors and waiting time) were found to be related to the utilization of the UHS (Table 5). Backward elimination method was used to determine the best model for predicting the utilization of university health services at $P < 0.05$. The reference category was 'poor perception of quality'. The 'best' model included both structure and process indicators namely; availability/experience of staff (AOR 2.44; CI 1.67-3.58), organization of healthcare (AOR 1.64; CI 1.11-2.41), continuity of treatment (AOR 1.74; CI 1.12-2.70) and waiting time (AOR 0.41; CI 0.28-0.61) as the potent predictors of utilization of the UHS (Table 6). The AIC and BIC for this model are lower than the earlier implying less information loss and suggesting that it is a better model. The model showed only a fair discrimination potential with an area under the ROC curve of 75.11% (Figure 1).

Table 4: Association between participants' perception about the quality and utilization of university health services

Good perception about quality of the university health services	Utilization of UHC		χ^2	P value
	Yes n (%)	No n (%)		
Availability of providers	191 (71.0)	78 (29.0)	0.640	0.424
Accessibility of providers.	224 (72.0)	87 (28.0)	2.201	0.138
Type and size of providers	270 (70.1)	115 (29.8)	0.321	0.571
Availability/experience of the staff	254 (78.4)	70 (21.6)	27.202	<0.001*
The organization of health care	221 (76.2)	69 (23.8)	12.472	<0.001*
The cost of treatment	189 (73.8)	69 (26.2)	4.242	0.039*
Socio-demographic factors of the individual doctors	130 (67.4)	63 (32.6)	0.522	0.470
Interpersonal factors	298 (69.0)	134 (31.0)	0.090	0.764
Availability of information	218 (74.7)	74 (25.3)	7.583	0.006*
Continuity of treatment	139 (79.0)	37 (21.0)	10.894	0.001*
Waiting time	118 (60.5)	77 (39.5)	10.571	0.001*
Quality of treatment	290 (74.0)	102 (26.0)	11.481	0.001*
Mortality rate	73 (70.2)	31 (29.8)	0.044	0.834
Morbidity rate	77 (73.3)	28 (26.7)	0.958	0.328

*statistically significant at $p = 0.05$

Table 5: Multivariate logistic regression model for provider-related quality predictors of utilization of University Health Center

Perception about quality of Service	COR	β	AOR	95% CI	p value
Availability of providers	1.154	0.258	1.294	0.876-1.906	0.192
Accessibility of providers.	1.300	0.138	1.148	0.750-1.758	0.524
Type and size of providers	1.110	-1.598	0.852	0.548-1.326	0.478
Availability/experience of the staff	2.553	0.891	2.439	1.585-3.753	<0.001*
The organization of health care	1.889	0.505	1.657	1.091-2.517	0.018*
The cost of treatment	1.454	0.157	1.170	0.780-1.754	0.447
Socio-demographic factors of the individual doctors	0.873	-0.143	0.867	0.554-1.357	0.532
Interpersonal factors	0.942	-0.532	0.587	0.360-0.960	0.034*
Availability of information	1.637	0.281	1.324	0.844-2.077	0.222
Continuity of treatment	1.993	0.455	1.575	0.989-2.509	0.055
Waiting time	0.550	-0.837	0.433	0.280-0.670	<0.001*
Quality of treatment	1.850	0.264	1.302	0.796-2.129	0.293
Mortality rate	1.056	-0.138	0.871	0.431-1.760	0.700
Morbidity rate	1.265	0.257	1.293	0.650-2.570	0.464

*statistically significant at $p=0.05$; AIC=698.057; BIC=764.011; Pseudo $R^2=0.0968$

Table 6: 'Best model' for provider-related quality predictors of utilization of University Health Center

Perception about quality of Service	β	AOR	95% CI	p value
Availability/experience of the staff	0.894	2.445	1.668-3.583	<0.001
The organization of health care	0.492	1.636	1.112-2.407	0.012
Continuity of treatment	0.552	1.736	1.117-2.699	0.014
Waiting time	-0.892	0.410	0.277-0.608	<0.001

AIC= 691.786; BIC=713.770; Pseudo R²=0.1482

DISCUSSION

This current study found that the participation rate among students was higher than that of the staff. Many of the participants did not have enough information to be able to assess the quality of the university health services. We found that the utilization of the university health services was predicted by the participants' perception of some provider-related quality indicators while some indicators did not predict utilization.

The difference in the response rates reflects a differential in the willingness of staff and students to participate in the research. The students were more willing than the staff to participate in the study. The main reason for the decline given by the staff was that they were busy. This persisted despite repeated efforts (maximum of three for each participant) and changing of interview time in order to adjust to the schedule of the staff. Participant type is known to influence response rates to surveys with university teachers tending to have relatively low response rates to surveys, generally (23,24). Also, the methods that will enhance success differ from group to group (23).

The skewness observed in the distribution of the age and the number of years spent at the university underlines the diversity of the participants. They consisted predominantly of relatively young students and older members of staff, academic and non-academic.

Significant proportions of the participants were unable to give assessment of the quality of the UHS because they did not know it. This was especially so for the outcome indicators of quality. The fact that about two-thirds of the participants were unable to make outcome quality assessment may be responsible for the finding of the study which showed that outcome quality indicators were not significant predictors of health service utilization. This apparent lack of awareness of relevant aspects of services provided is a potential barrier to the utilization because adequate information about the quality of service is a major

ingredient for the choice of healthcare provider (14). It is, therefore, important for the services to be made obvious to the members of the immediate community. This underscores the need for social marketing of health service to the target population in addition to geographic accessibility and availability of quality services. The question may arise as to whether the participants actively chose their healthcare provider or that the institution had covertly made the choice for them by operating its services within the environment of the institution. While this influence cannot be denied, it is evident that participants have a choice based on the finding that more than 30% of the participants would not use the UHS despite the proximity and the attached students/staff health insurance that significantly subsidizes the cost of accessing the care. In fact, the students access the services at no extra cost. Other studies have also found that geographic access is not enough to ensure the utilization of services. Other factors like cost, information, culture, quality and acceptability of the services have been found to be important in low and middle-income countries (25,26). Unlike in Europe where patients' choice of provider is a re-emerging idea (10,27), patients in sub-Saharan Africa have no restrictions as to which provider they patronize largely because they are largely responsible for the cost of healthcare. Community members have been shown to sometimes prefer to use health facilities other than the one in their communities (1).

Utilization of the UHS was predicted by some structure and process quality indicators. The choice of a health provider is determined by a complex interaction between the provider and patient-related factors (10,11). Availability/experience of the provider, organization of healthcare, waiting time and continuity of care were potent predictors of utilization of the UHC; the waiting time being inversely related to the utilization of the UHC. Similar findings have been found with other categories of health facilities in different settings

(28,29,30). However, many other factors including perception about cost did not predict the utilization in this study. The value of pseudo R^2 (14.8%) contributed by the predictors might suggest that there may be many other factors that are involved in a complex manner in the participants' decision to utilize the UHC. However, the fairly good level of discrimination suggests that the potent structure and process predictors of utilization distinguish those who utilize the health center from those who do not. Studies employing such rigorous epidemiology methods to the subject matter are rare and probably non-existent in sub-Saharan Africa. This, therefore, might offer a new dimension to exploring the perception of provider-related quality factors in university health services in the region.

Some caution is required in the interpretation of the findings of this study. It is a cross-sectional study of one UHC. Therefore, temporality cannot be established and generalizability may be limited. However, the sample size is large enough to confer reasonable power. Participants gave self-reported responses which are subject to some bias. The differential response rate suggests some differences among the participants but then, the study did not compare the outcome variable among the participant groups. The aim was to study the group as a unit.

This study assessed outcome indicators with morbidity and mortality measures. This may not be widely accepted by providers for social marketing reasons. Besides, considerable proportions of the participants did not have any opinion on the mortality and morbidity rates. Other more acceptable outcome measures need to be explored for the assessment of the perception of the quality of university health services.

In conclusion, the utilization of the UHC by students and staff is predicted by the availability/experience of health provider, organization of healthcare, waiting time and continuity of care. Waiting time has an inverse relationship with the UHC utilization. The structure-process-outcome approach discriminated quite well between the students and the staff who utilize the university health center and those who do not. It also suggests that there are other factors that act in a complex way to predict the choice of health provider. Beyond geographic availability, there is a need for targeted social marketing by providers of UHS to create awareness about the services.

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REFERENCES

1. Lux M, Fasching P, Schrauder M, Löhberg C, Thiel F, Bani M et al. The era of centers: the influence of establishing specialized centers on patients' choice of hospital. *Archives of Gynecology and Obstetrics*. 2010;283(3):559-568.
2. Ibor U, Atomode T. Health Service Characteristics and Utilization in Calabar Metropolis, Cross River State, Nigeria. *Academic Journal of Interdisciplinary Studies [Internet]*. 2014;3(1):365-370. Available from: <http://10.5901/ajis.2014.v3n1p265>.
3. Iyun F. Factors Influencing Patronage of Hospitals in Ibadan City. *The Nigerian Geography Journal*. 1983;26(1-2):33-41.
4. Okafor S. Location, Distribution and Question of Justice. An Inaugural Lecture. Ibadan: University of Ibadan Press; 2007.
5. Ojong O, Ibor U, Eni D. Distribution and Utilization of Health Facilities in Calabar Metropolis. 2011;2(1):346-347.
6. Kabene S, Orchard C, Howard J, Soriano M, Leduc R. The importance of human resources management in health care: a global context. *Human Resources for Health*. 2006;4(1).
7. Billings J, Zeitel L, Lukomnik J, Carey T, Blank A, Newman L. Impact of socioeconomic status on hospital use in New York City. *Health Affairs*. 1993;12(1):162.
8. Abiodun O, Olu-Abiodun O. The determinants of Choice of Health Facility in Sagamu, South-West, Nigeria. *Scholars Journal of Applied Medical Sciences (SJAMS)*. 2014;2:274-282.
9. Tai W, Porell F, Adams E. Hospital Choice of Rural Medicare Beneficiaries: Patient, Hospital Attributes, and the Patient-Physician Relationship. *Health Services Research*. 2004;39(6p1):1903-1922.
10. Dixon A, Robertson R, Bal R. The experience of implementing choice at point of referral: a comparison of the Netherlands and England. *Health Economics, Policy and Law*. 2010;5(03):295-317.
11. Fung C, Elliott M, Hays R, Kahn K, Kanouse D, McGlynn E et al. Patients' Preferences for Technical versus Interpersonal Quality When

- Selecting a Primary Care Physician. *Health Services Research*. 2005;40(4):957-977.
12. Puchalski C. Spirituality in health: the role of spirituality in critical care. *Critical Care Clinics*. 2004;20(3):487-504.
 13. Mairiga A, Kullima A, Bako B, Kolo M. Sociocultural factors influencing decision-making related to fertility among the Kanuri tribe of north-eastern Nigeria. *African Journal of Primary Health Care & Family Medicine*. 2010;2(1):1-4.
 14. Victoor A, Delnoij D, Friele R, Rademakers J. Determinants of patient choice of healthcare providers: a scoping review. *BMC Health Services Research*. 2012;12(1):272.
 15. Obiechina G, Ekenedo G. Factors affecting utilization of University health services in a tertiary institution in South-West Nigeria. *Nigerian Journal of Clinical Practice*. 2013;16(4):454.
 16. List of universities in Nigeria [Internet]. En.wikipedia.org. 2017 [cited 6 October 2017]. Available from: https://en.wikipedia.org/wiki/List_of_universities_in_Nigeria.
 17. Department of Education; Seventh-day Adventist Church [Internet]. Education.gc.adventist.org. 2017 [cited 6 October 2017]. Available from: <http://education.gc.adventist.org/colleges.html>.
 18. Kish L. Survey Sampling. New York: John Wiley and Sons; 1995.
 19. Colsen P, Casparie A. Indicatorregistratie: een model ten behoeve van integrale kwaliteitszorg in een ziekenhuis. *Medisch Contact*. 1995;50(9):297-299.
 20. Claessen S, Francke A, Brandt H, Pasma H, Van der Putten M, Deliens L. Ontwikkelingstoetsing van een set kwaliteitsindicatoren voor de palliatieve zorg. *Nederlands Tijdschrift voor Palliatieve Zorg*. 2010;10:3-10.
 21. Donabedian A. Evaluating the Quality of Medical Care. *Milbank Quarterly*. 2005;83(4):691-729.
 22. Victoor A, Friele R, Delnoij D, Rademakers J. Free choice of healthcare providers in the Netherlands is both a goal in itself and a precondition: modelling the policy assumptions underlying the promotion of patient choice through documentary analysis and interviews. *BMC Health Services Research*. 2012;12(1):441.
 23. Anseel F, Lievens F, Schollaert E, Choragwicka B. Response Rates in Organizational Science, 1995–2008: A Meta-analytic Review and Guidelines for Survey Researchers. *Journal of Business and Psychology*. 2010;25(3):335-349.
 24. Aznar Minguet P, Martinez-Agut M, Palacios B, Piñero A, Ull M. Introducing sustainability into university curricula: an indicator and baseline survey of the views of university teachers at the University of Valencia. *Environmental Education Research*. 2011;17(2):145-166.
 25. Peters D, Garg A, Bloom G, Walker D, Brieger W, Hafizur Rahman M. Poverty and Access to Health Care in Developing Countries. *Annals of the New York Academy of Sciences*. 2008;1136(1):161-171.
 26. Ensor T. Overcoming barriers to health service access: influencing the demand side. *Health Policy and Planning*. 2004;19(2):69-79.
 27. Ranerup A, Norén L, Sparud-Lundin C. Decision support systems for choosing a primary health care provider in Sweden. *Patient Education and Counseling*. 2012;86(3):342-347.
 28. Bernard M, Sadikman J, Sadikman C. Factors influencing patients' choice of primary medical doctors. *Minnesota medicine*. 2006;89(1):46-50.
 29. Plunkett B, Kohli P, Milad M. The importance of physician gender in the selection of an obstetrician or a gynecologist. *American Journal of Obstetrics and Gynecology*. 2002;186(5):926-928.
 30. Groenewoud A. Chronic depression or Alzheimer's disease, using discrete choice experiments. What influences patients' decisions when choosing a health care provider? Measuring preferences of patients with Knee arthrosis. In It's your Choice! A study! A study of search and selection processes, and the use of performance indicators in different patient groups. PhD thesis. Rotterdam: Erasmus Universiteit Rotterdam; 2008.