ASSESSMENT OF THE PSYCHOMETRIC PROPERTIES OF SERVQUAL AMONG ADOLESCENTS LIVING WITH HIV IN NIGERIA

Olumide Abiodun[1], Kolawole Sodeinde[1], Fikayo Bamidele[1], Omodele Jagun[2]

[1]Department of Community Medicine, Benjamin Carson School of Medicine, Babcock University, Ilishan-Remo, Ogun State, Nigeria.

[2]Department of Ophthalmology, Benjamin Carson School of Medicine, Babcock University, Ilishan-Remo, Ogun State, Nigeria.

Corresponding author's email address: *olumiabiodun@gmail.com*

***ABSTRACT**: The SERVQUAL can bridge the gap created by the paucity of client-report of quality of adolescent HIV care in LMIC. This study aimed to assess the psychometric properties of the SERVQUAL among adolescents in Nigeria. We used the SERVQUAL to obtain data from 212 adolescent s (aged 15 to 19 years) accessing HIV care in the southwest, Nigeria. We conducted exploratory factor analysis (EFA) to identify the underlying patterns in the instrument and confirmatory factor analysis (CFA) to validate our constructs, using the IBM SPSS and AMOS software, respectively. All the items loaded according to the original SERVQUAL except one item in the assurance domain, which was dropped due to poor factor loading (<0.4). The five factors contributed 63.60% of the variance. Upon CFA, the five-factor model had a good fit (Chi-square/df = 2.114, GFI = 0.909, CFI = 0.960, RMSEA = 0.073). All the retained factor loadings range from 0.67 to 0.86. The Cronbach's α for the five domains ranged from 0818 to 0.865, while composite reliability ranged from 0.820 to 0.878. All the average variance extracted (AVE) (from 0.646 to 0.696) were greater than 0.5. The square roots of all the AVE were greater than the correlation between the various constructs, indicating divergent validity. Responsiveness (0.51) had the greatest impact on satisfaction with HIV care services followed by reliability (0.39). The instrument demonstrated satisfactory reliability and validity, and good relationships with the participants' overall rating of their satisfaction with HIV care services using the SERVQUAL.*

Keywords: Adolescents living with HIV, Client satisfaction, Psychometric, SERVQUAL

INTRODUCTION

There is a need for constant improvement and better quality in the provision of health care to ensure competitive advantage and improve patient outcomes. In the setting of HIV care, the perception of the quality of care is critical to service uptake, medication adherence, and clinic visit compliance.

The dimensions of healthcare required by people living with HIV (PLWH) are dynamic, especially as HIV is now managed as a chronic disease over prolonged periods [1]. Chronic diseases like HIV pose unique challenges to the health system particularly during periods of transition, like from specialists to primary care, childhood to adult care, and so on [2,3]. The models of care for childhood and adult HIV care differ significantly. Hence, such a transition is imperative. Adolescence represents a period transition that links childhood to adulthood and is characterized by significant physical and psychosocial changes. A key mechanism of providing support for the health system is by continuously measuring transformative processes and outcomes, and providing pertinent feedback to the relevant stakeholders [4]. The proper use of feedback in improving the health system depends on the availability of feasible, acceptable, reliable, and valid indicators. The stakeholders' confidence depends on the evidence concerning the performance of the elements of the indicator(s) [3].

In healthcare, the patient is the most important stakeholder, and the health system should endeavor to render quality services while achieving good health outcomes for them. There is a need for health workers to identify and satisfy the felt needs of patients, who are considered to be clients. Client satisfaction is an inherent element of the quality of service [5,6].

The concept of quality of care has evolved in the last couple of decades and has gradually attained importance in low-and middle-income countries. Health care institutions have largely created quality assessment units that are mandated to develop quality assessment and management frameworks to evaluate client perception of health service quality. Researchers and institutions have identified and used different dimensions and tools for quality assessment to varying degrees of success. A scoping review of the performance indicators of the measures of HIV quality of care showed that the available frameworks presented a cocktail of indicators for a primary care assessment. However, patient-reported metrics were not quite adequate [3].

The SERVQUAL model of quality assessment proposed in 1988 7 and widely used in healthcare, education, banking, and other sectors 5,8,9. SERVQUAL is a client perception of service quality assessment tool that evaluates five quality domains namely; 1) Tangibles: relating to the physical facilities, equipment, and the appearance of personnel, 2) Reliability: which is concerned with the capacity for the dependable and accurate performance of offered services, 3) Responsiveness: relating to the willingness to support clients and offer timely services, 4) Assurance: which evaluates the tendency for personnel to inspire trust and demonstrate confidence, and 5) Empathy: which relates to the delivery of compassionate and individualized care to the clients.

The SERVQUAL may help bridge the gap created by the paucity of client-report of quality of HIV care. Although the tool has been validated in clinical and non-clinical settings, it is necessary to validate in the adolescent age group in LMICs HIV setting. This research aimed to assess the psychometric properties of the SERVQUAL among adolescents accessing care in southwest Nigeria.

Conceptual framework

Figure 1 shows the conceptual framework for the study. The chart is a graphical representation of the hypothetical relationships among three sets of study variables, namely the five dimensions of the SERVQUAL, the SERVQUAL itself, and client satisfaction with HIV care.
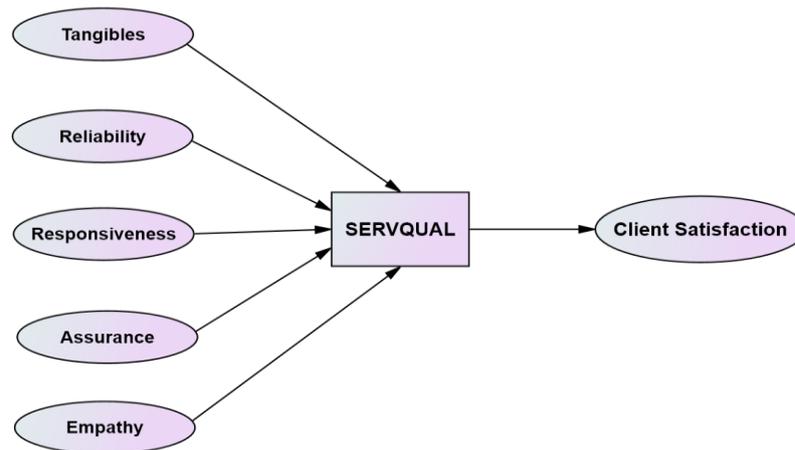
Figure 1: Conceptual framework of study variables

METHODS

We conducted a cross-sectional study of 212 adolescent s (aged 15 to 19 years) accessing HIV care in five comprehensive antiretroviral therapy (ART) facilities across two states in southwest Nigeria. The current report represents a part of a bigger study described elsewhere [10]. The survey included those that gave consent and whose guardians also gave assent, and excluded those who were either physically or mentally unfit to participate. The study purposively selected five ART sites with a large adolescent population and enrolled volunteers into the after a comprehensive informed consent process. Trained research assistants conducted structured interviews using a close-ended questionnaire. The questionnaire explored volunteers' sociodemographic characteristics and satisfaction with the services provided at the health facilities using the SERVQUAL tool. The instrument has two parts of 22-item each, assessing five domains of client satisfaction 7. The first part assesses expectations while the second evaluates the clients' perceived satisfaction with services. The 22-item perception part was used for psychometric analysis. The sample size was large enough to meet the recommendations of five to ten participants per item for evaluating the properties of a tool [11].

We used the IBM SPSS Statistics software version 22 and the Analysis of Moment (AMOS) version 20 for data analyses. We conducted exploratory factor analysis (EFA) using principal axis factoring and assessed reliability to identify the underlying patterns in the instrument. We then conducted Confirmatory Factor Analysis (CFA) to validate our constructs and determine its alliance with our theoretical orientation and confirm the fit of our model to the data. The study assessed internal consistency, composite reliability, convergent and divergent validity of the instrument. The model fit of the CFA was tested based on the Hu and Bentler Criteria [12].

RESULTS

Participants' characteristics

The mean age was 16.62±1.37 years. One hundred four (49.1%) of the participants were females, while 108 (50.9%) were males. All of them were single and not previously married. More than half of them (53.8%) had completed primary school education, while 43.9% had completed secondary school. One hundred and seventy-nine (84.4%) of them were still schooling, sixteen (7.5%) were artisan trainees, and thirteen (6.1%) were unemployed. The remaining 1.9% had no formal education. About two-thirds (63.7) of the adolescents were Yoruba while about a quarter (23.1) were Igbo. Nine (4.2%) of them had at least one form of disability.

Exploratory Factor Analysis

The Kaiser Meyer-Olkin (KMO) values of 0.939 indicated the sample size was adequate for the EFA. The p-value from Bartlett's test of sphericity of <0.001 confirmed the presence of at least one reliable correlation among the indicators of each of the variables. The EFA used principal axis factoring with Promax rotation (the factors were highly correlated: 0.669) and Kaiser normalization to extract five latent variables. As shown in Table 1, the items loaded according to the original SERVQUAL except that item 4 in the assurance domain which was dropped because the factor loading was less than 0.4. The five factors contributed 63.60% of the variance. The Cronbach's alpha values for the Tangibles (0.840, Reliability (0.871), Responsiveness (0.875), Assurance (0.875), and Empathy (0.868) constructs indicated good internal consistencies.

Table 1: Exploratory factor Analysis for SERVQUAL among adolescents living with HIV

Construct	Items of the original SERVQUAL	notation	Factor loading
Tangibles	Equipment are Up-to-date	t1	0.523
	Facilities are visually appealing	t2	0.677
	Employees are well-dressed	t3	0.814
	Facilities match services	t4	0.691
Reliability	Facilities keep their promises	rel1	0.441
	Providers are sympathetic and reassuring	rel2	0.469
	Providers are dependable	rel3	0.532
	Services are provided at the promised time	rel4	0.705
	Records are accurate	rel5	0.746
Responsiveness	Providers say exactly when services will be done	re1	0.574
	Employees offer prompt services	re2	0.516

|	Employees are always willing to help	re3	0.423
	Providers give prompt response to client's requests	re4	0.836
Assurance	Clients trust employees	ass1	0.433
	Clients feel safe with employees	ass2	0.727
	Employees are polite	ass3	0.646
	Employees are well supported to do their jobs	ass4	Dropped
Empathy	Clients get individual attention	emp1	0.592
	Employees give personal attention to clients	emp2	0.881
	Employees know clients' needs	emp3	0.702
	Employees have clients' interests at heart	emp4	0.690
	Operating hours are convenient	emp5	0.483

Confirmatory Factor Analysis
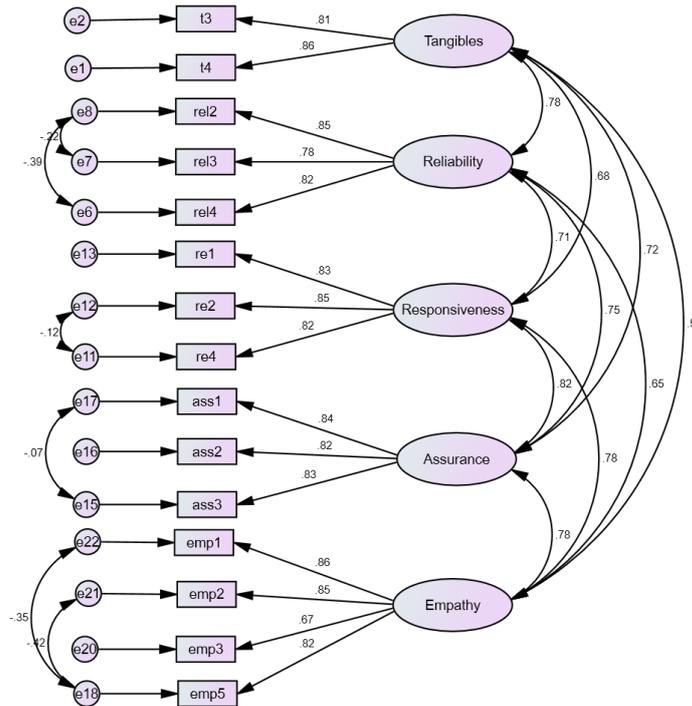
Figure 2: Five-factor correlated CFA model
CMIN/DF=2.114 <5, P=0.000 <0.05, GFI=0.909 <0.9, IFI=0.960 <0.9, TLI=0.943 <0.9,
CFI=0.960 <0.9, RMSEA=0.073 <0.08, SRMR=0.0398 <0.05

The five-factor model had a good fit (Chi-square/df = 2.114, GFI = 0.909, CFI = 0.960, RMSEA = 0.073) after we had dropped variables due to poor factor lading and problematic standardized residual covariance, and made corrections for the error terms. We dropped the following variables due to poor factor loadings and problematic standardized residual covariance; 1) equipment are up-to-date, 2) facilities are visually appealing, 3) facilities keep their promises, 4) records are accurate, 5) employees are willing to help, and 6) employees have clients' interests at heart. We correlated between some error terms that measure similar constructs. The correlations between them are higher than the others, and there is a need to correlate them to ensure stability. All the retained factor loadings range from 0.67 to 0.86.

Table 2: Validity and Reliability of the SERVQUAL scale

Constructs	IC	CR	AVE	MSV	MaxR(H)	Reliability	Tangibles	Responsiveness	Assurance	Empathy
Reliability	0.818	0.860	0.672	0.607	0.864	**0.820**				
Tangibles	0.823	0.820	0.695	0.607	0.824	0.779	**0.834**			
Responsiveness	0.865	0.873	0.696	0.667	0.873	0.709	0.683	**0.834**		
Assurance	0.863	0.868	0.687	0.667	0.868	0.747	0.718	0.817	**0.829**	
Empathy	0.852	0.878	0.646	0.608	0.893	0.647	0.590	0.776	0.780	**0.803**

Table 2 shows that the Cronbach alpha values for the five domains ranged from 0818 to 0.865, which is good. Also, the composite reliability ranged from 0.820 to 0.878, which is good. The average variance extracted (AVE) for all the five constructs, which ranged from 0.646 to 0.696, were greater than 0.5, indicating convergent validity. The square roots of all the AVE were greater than the correlation between the various constructs. Therefore, there was divergent validity [13].
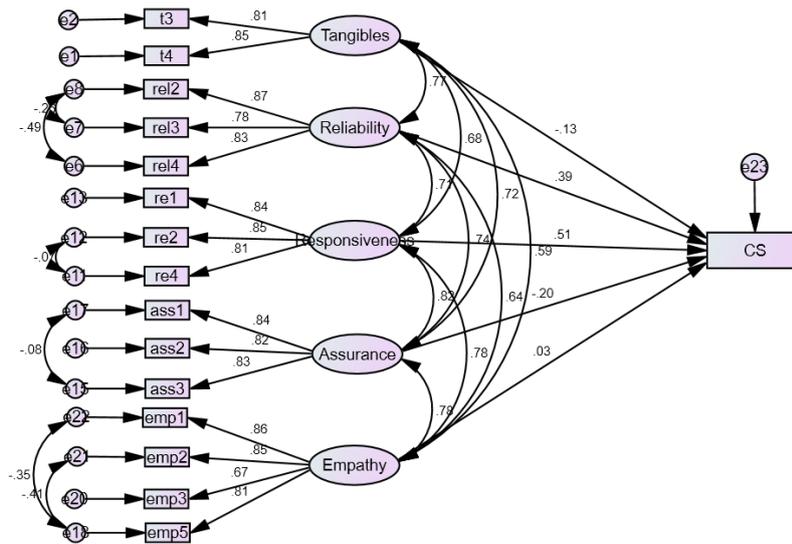
Figure 3: Five dimensions and Adolescents' satisfaction with HIV care services

Relationship between the SERVQUAL dimensions and satisfaction with HIV care

Figure 3 shows the relationship between the five dimensions of SERVQUAL and the adolescents' satisfaction with HIV care services. The study assessed the strengths of the relationship using the standardized coefficient betas. Responsiveness (0.51) had the greatest impact on satisfaction with HIV care services followed by reliability (0.39). The model parameters (CMIN/DF=2.270, p=0.000, GFI=0.901, CFI=0.950, RMSEA=0.078, and SMSR=0.0413) are within acceptable limits, indicating a good fit.

DISCUSSION

This study aimed to validate the factor structure and psychometric properties of the SERVQUAL among a sample of HIV positive adolescents (aged 15 to 19 years) in the southwest, Nigeria. The data analysis confirmed a five-factor structure with factor loadings which were mostly consistent with the findings of other authors [3,5,7,8]. The instrument demonstrated satisfactory reliability and validity, and good relationships with the participants' overall rating of their satisfaction with HIV care services using the SERVQUAL. The current study shows that responsiveness had the greatest impact on satisfaction with HIV care services followed by reliability and empathy. This finding is consistent with the result from studies assessing the psychometric properties of SERVQUAL in the banking, education, healthcare industries [8,14-16]. Although some studies in the education sector concluded that the tangibility had the highest influence on satisfaction 5,8. There is a need for HIV service managers to develop strategies to improve on the tangibles (equipment, facilities, and general outlook), assurance (attitude of health workers to engender clients' trust), and empathy.

This study is one of the few available from the study setting validating SERVQUAL. The findings provide evidence for the reliability of the instrument for measuring client satisfaction. The strengths of the current research are the use of confirmatory factor analysis and the direct application of a theory-based, widely available scale to a specific population in a clinical setting. Future research should focus on comparing the scale with other potent client satisfaction scales in similar and broader HIV contexts.

Conflict of interest

The study was investigator-initiated, therefore, the funders were not involved in the design, data collection, data analysis, writing of this manuscript, and in the decision to submit this manuscript for publication. The authors have no further conflict of interest to declare.

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