Int J Clin Pharm (2014) 36:636–647
DOI 10.1007/s11096-014-9948-3

RESEARCH ARTICLE

Assessment of satisfaction with pharmaceutical services in patients receiving antiretroviral therapy in outpatient HIV treatment setting

Kenneth Anene Agu · Dorothy Oqua · Peter Agada · Samuel I. Ohiaeri · Afusat Adesina · Mohammed Habeeb Abdulkareem · Rosalyn C. King · Anthony K. Wutoh

Received: 18 October 2013 / Accepted: 1 April 2014 / Published online: 16 April 2014

Abstract *Background* The patient's perception and satisfaction are increasingly considered as a useful factor in the assessment of competency of health care providers and quality of care. However, these patient focused assessments are largely ignored when assessing health care outcomes. *Objective* The study assessed the perception and satisfaction of patients receiving antiretroviral therapy (ART) with pharmaceutical services received in outpatient HIV treatment settings. *Setting* Seventeen HIV treatment centres in Nigeria. *Methods* This cross-sectional survey included 2,700 patients randomly selected from 26,319 HIV patients on ART, who received pharmaceutical services in the study setting. A study-specific Likert-type instrument was administered to the participants at point of exit from the pharmacy. Midpoint of the 5-point scale was computed and scores above it were regarded as positive while below as negative. Chi-square was used for inferential statistics. All reported p values were 2-sided at 95 % confidence interval (CI). *Main outcome measure* Patient satisfaction with pharmaceutical services. *Results* Of 2,700 patients sampled, data from 1,617 (59.9 %) were valid for analysis; 62.3 % were aged 26–40 years and 65.4 % were females. The participants had received pharmaceutical services for a mean duration of 25.2 (95 % CI 24.3–26.1) months. Perception of participants regarding the appearance of pharmacy was positive while that regarding the pharmacists' efforts to solve patients' medication related problems was negative. The participants' rating of satisfaction with the waiting time to access pharmaceutical services was negative; the satisfaction decreases with increasing waiting time. However, the satisfaction with the overall quality of pharmaceutical services received was rated as positive; 90.0 % reported that they got the kind of pharmaceutical services they wanted; 98.2 % would come back to the pharmacy if they were to seek help again and would recommend services to others. The level of satisfaction was found to be associated with educational status of the participants ($p = 0.006$) unlike age, sex, marital and employment status. *Conclusion* The satisfaction with overall quality of pharmaceutical services received by participants was positive. Longer waiting times resulted in lower patient satisfaction. High patient load may be the cause of the long waiting time and the inadequate duration of interaction between pharmacist and the patient.

Keywords HIV/AIDS · Nigeria · Patients · Perception · Pharmaceutical care · Satisfaction · Services

Impact of findings on practice statements

- Patient perception and satisfaction with pharmaceutical services is a useful factor in the assessment of pharmacist's performance and consequently the health care outcomes.
- Nigerian HIV patients in a HIV treatment centre, have negative perception regarding pharmacists' communication and the pharmacists' efforts to solve their medications related problems.

K. A. Agu (✉) · D. Oqua · P. Agada · S. I. Ohiaeri · A. Adesina · M. H. Abdulkareem
Pharmacist and Continuing Education (PACE) Center, Howard University, Coscharis Plaza, Plot 1070 Faskari Street, Area 3, PO Box 10435, Garki Abuja 900001, FCT, Nigeria
e-mail: agkenneth@gmail.com

R. C. King · A. K. Wutoh
College of Pharmacy, Pharmacist and Continuing Education (PACE) Center, Howard University, Washington, DC, USA

- Interventions targeted at improving the communication and problem-solving skills of pharmacists are imperative for better treatment outcomes in this setting.

Introduction

Patients are essential source of information about accessibility and effectiveness of care [1, 2]. The patient's perception is increasingly considered as a useful factor in the assessment of health care outcomes [1, 3, 4]. The patient's perception of care has direct influence on treatment adherence [1]. Patient satisfaction is a primary outcome that may be defined as the extent to which an individual's needs and wants are met [5]. It is a highly personal assessment of health care services and providers [6] that is greatly affected by the preferences and expectations of the patient [7]. The patient's preferences and expectations may be viewed as the determinants of satisfaction, whereas the elements of care, such as technical and interpersonal aspects, are the components of satisfaction [7, 8]. Satisfaction reflects the realities of care [7], and it is based on the patient's experience of both contacts with the organization and personal outcomes. Patient satisfaction can be conceptualized as patient's evaluation of the pharmacist's performance in a variety of patient care activities [7, 9].

Pharmaceutical care is defined as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve the patient's quality of life" [10]. It is a patient focused and outcome oriented pharmacy practice in which the pharmacist takes responsibility for a patient's drug related needs and holds him or herself accountable for meeting the needs [11, 12]. Successful implementation of a pharmaceutical care practice model has the potential to increase both patients' expectations and satisfaction with their pharmacists' activities [13]. Pharmaceutical care has become a preferred mode of practice [14, 15] and the attitudes of pharmacists towards this practice are favorably high irrespective of the practice settings [16]. The pharmacy practice in Nigeria has remained focused largely on the products (drugs) even though many are aware of the changing role of the clinical pharmacist globally. Pharmaceutical care has not been fully integrated into professional pharmacy practice as a standard of care for patients in Nigeria [14]. However, pharmacists in Nigeria indicated willingness to implement pharmaceutical care but reported inadequate knowledge, professional skills and the pharmacy layout as the barriers to the practice of pharmaceutical care [17]. Recently, the pharmaceutical care education was included in the pharmacy training curriculum in Nigeria to promote pharmaceutical care as a philosophy and standard of provision of care for patients.

Pharmaceutical care is an individualized care and is more critical in pharmacotherapy for chronic conditions such as HIV. Personalized services are essential to patient satisfaction. In Bangladesh, the service quality factors identified as important for patients' satisfaction were timeliness and convenience, personal attention, reliability and dependability, health worker competence and professionalism, empathy, responsiveness, assurance, availability, and tangibles such as physical facilities, environment, equipment and the appearance of the personnel [18]. Patients want not only a professional pharmacist but someone who is receptive and dispose to friendliness. Gauging patient sentiment with satisfaction scores is a useful way to point out deficiencies and improve the patient experience. However, these patient focused assessments are largely ignored by health care managers.

Patient satisfaction surveys are increasingly being used in hospitals to assess the competency of health care providers and the quality of care, particularly as satisfaction relates to continuity of care [9]. A study that assessed patient satisfaction with pharmaceutical services in Nigeria reported that patients experience low satisfaction with pharmaceutical services; 46 % rated the amount of time the pharmacist offered to spend with them as poor; and 49 % felt satisfied with the pharmaceutical services [19]. Perceived satisfaction was significantly higher in "friendly explanation" than in "managing therapy". The socio-demographic characteristics of patients were found to have no association with their level of satisfaction [19]. Satisfaction surveys provide "actionable" data that reveal obvious steps for improvement. Satisfied patients have been defined as "ones who receive significant added value" to their bottom line [20]; they have a more positive relationship with their health care provider [13, 21], and are also more likely to continue to use health care services [13, 22, 23] and remain adherent to medical regimens [13, 24, 25]. In a study conducted in Ethiopia, majority of HIV-infected patients (82.5 %) were dissatisfied with long waiting time to get pharmacy services. As the waiting time to get pharmacy service increases, the level of satisfaction among HIV-infected patients decreases. Other areas of dissatisfaction included (45.2 %) lack of description about ART drugs, (22.4 %) impoliteness of pharmacy staffs, and (4.20 %) shortage of drugs [25]. The level of satisfaction was not associated with age, educational status, sex and monthly income of the patients [25]. There is paucity of data on patients' perception and/or satisfaction about the pharmaceutical care-based services in HIV therapy in Nigeria.

Aim of the study

The aim of this study is to assess the perception and satisfaction of HIV-infected patients receiving antiretroviral

therapy regarding pharmaceutical services in outpatient HIV treatment setting.

Methods

Research design

This involved a cross-sectional survey of patients on antiretroviral therapy (ART), who were provided pharmaceutical care in the selected health facilities.

Setting

This study was carried out in 17 secondary (15 public and 2 faith-based) health facilities in an urban setting. The health facilities offer comprehensive HIV care and treatment services. HIV-positive clients identified at the HIV counseling and testing service points are enrolled into a Pre-ART register for follow-up. Those who meet the eligibility criteria for starting antiretroviral therapy based on the Nigeria national ART guideline are enrolled into ART register and are commenced on treatment. Antiretroviral drugs and a number of drugs for the treatment of opportunistic infections and other related services are fully funded by President's Emergency Plan for AIDS Relief (PEPFAR) through US Agency for International Development (USAID) and are provided at-no-cost to the patients.

Interventions

The interventions included the infrastructural upgrade of the pharmacies, provision of audio-visual privacy; and initial didactic training of pharmacists on pharmaceutical care in HIV. Some of the topics covered in the training included: concept of pharmaceutical care; pharmacotherapeutics of HIV/AIDS; clinical pharmacovigilance for antiretroviral drugs; laboratory parameters, interpretations and monitoring in HIV care; common opportunistic infections and its management; HIV prevention; effective delegation in pharmacy; monitoring and evaluation in pharmacy. This training was followed up with an onsite hands-on pharmacy best practices training that focused on the following elements namely: dispensing, patient counseling, medication refilling, patient adherence, referral process, education programs, interaction with other health team members, data production and collection, and control of drugs. The trainings curricula were developed by Howard University Pharmacists and Continuing Education (HU PACE) Center for the Global HIV/AIDS Initiative Nigeria (GHAIN) project. Standard operating procedures (SOP) for pharmaceutical care provision and the documentation tools were developed and deployed to the intervention sites. The capacity building interventions were provided prior to commencement of pharmaceutical services provision. There were ongoing follow-up monitoring and provision of technical assistance (as necessary) by HU PACE's team of monitoring and evaluation pharmacists in the health facilities. Pharmaceutical care package provided to patients included active screening of patients and the prescriptions for all potential and/or actual drug therapy problems, the provision of interventions and follow-up monitoring of patients on therapy.

Population/sample

Seventeen study sites were selected from 125 GHAIN-supported comprehensive HIV care and treatment centers (as at December 2010) using simple random sampling techniques. From 26,319 HIV-positive patients that were currently on ART as at December 2010, a sample of 2,700 patients was selected using simple random sampling techniques. The sample size was determined based on the 'rule of the thumb' proposed by Nunnally, who suggested that the number of subjects should be at least 10 times the number of items [26].

Selection criteria

All HIV-positive patients who were currently receiving highly active antiretroviral therapy (HAART) as at December 2010; and were provided pharmaceutical services in the ART pharmacy of the selected health facilities were eligible for inclusion in the study. Only patients who were provided pharmaceutical services in the ART pharmacy of the selected health facilities for at least 6 months duration and consented to participate were eligible for inclusion in the study. It is assumed that patients who received pharmaceutical services for at least 6 months duration will be better placed for the assessment of services provision compared to those who received services for <6 months duration. All patients who did not meet these criteria were excluded from the study.

Data collection

A study-specific and semi-structured questionnaire that employed a Likert-type scale was used to interview the study participants at the point of exit from the ART pharmacy. The interview was conducted by independent and trained research assistants over 1 month period. Local vernacular was used to interpret the questions for few participants who had limited ability in reading, writing or understanding of English language. The questionnaire consisted of 34 questions in 7 different domains.

Domains	No. of items
Pharmacists' communication	7
Medication use information	10
Pharmacists' commitment and respect for patients	5
Pharmacists' availability to attend to you	3
Confidentiality and waiting time	3
Pharmacists' efforts to solve your medications related problems	3
Infrastructure and appearance of the pharmacy	3

Ethical consideration

Ethical approval was obtained from National Health Research Ethics Committee (NHREC), Abuja Nigeria (NHREC/01/01/2007-10/05/2012b). Informed consent was obtained from the participants and they were assured of the confidentiality of the information.

Pre-testing of study instrument

The study instrument was field tested in HIV-positive patients who were currently receiving highly active antiretroviral therapy (HAART) and were provided pharmaceutical care for at least 6 months in the ART pharmacy of two health facilities. The responses were used to review the questionnaire by the researchers and expert colleagues for content validity; and reliability tested using test–retest technique. The characteristics of the participants used in the field testing were similar to the study sample and they were not included in the main study.

Data analysis

The data were analyzed using Predictive Analytical SoftWare (PASW) Statistics 18. Descriptive statistics was used for sample characteristics including responses on Likert rating scales. All negatively worded items in the Likert rating scale were reverse coded; and the scale was anchored in manner that higher scores indicate better perception or higher satisfaction with the questionnaire items. To determine the internal consistency of the instrument, reliability analysis was performed using Cronbach's alpha. The intraclass correlation coefficients (ICCs) with a two-way mixed model were also determined. A Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was calculated to determine the appropriateness of the variables for factor analysis. The sample is adequate if KMO value is >0.5 [27]; values >0.90 are rated as "marvelous" for factor analysis [28]. The Bartlett's test of sphericity was also performed; and a value <0.05 indicate statistical significance. Factor analysis was performed using principal components extraction and Varimax rotation with Kaiser normalization. Missing values in the factor analysis was handled using listwise deletion. Factors selected had eigenvalues >1. Items with factor loadings ≥0.40 were considered significant, and loadings ≥0.50 were considered "very significant" [29]. The mean item scores were computed for the individual items. SD was also determined. A midpoint of the 5-point scale was determined by adding all the scores and computing the average. Mean scale scores above the midpoint were regarded as positive perception and satisfaction while below the mid-point were considered as negative perception and satisfaction. Chi-square was used for inferential statistics. All reported p values were two-tailed and $p < 0.05$ indicated statistical significance, except where otherwise indicated.

Results

Socio-demographic characteristics of participants

Of the 2,700 patients sampled, data from 1,617 (59.9 %) were valid for analysis. The data from 1,083 (40.1 %) patients were excluded in the analysis due to incomplete responses to key variables of interest. Of the 1,617 participants, 62.3 % were aged 26–40 years; 65.4 % females; 56.1 % attained secondary level education; 47.3 % were self-employed; 60.2 % were married and living together; and 25.0 % had average monthly income <5,000 naira (Table 1). The participants had received pharmaceutical care in the outpatient ART pharmacy for a mean duration of 25.2 (95 % CI 24.3–26.1) months. The average number of clients provided pharmaceutical care per clinic day at the pharmacy was 94 (95 % CI 57–131) clients; and these clients were served by an average of two pharmacists.

Patients' perception of pharmacy and pharmaceutical services received

The midpoint of the 5-point scale for patients' perception of the pharmacy and pharmaceutical services received was 3.0. Mean scale scores above this midpoint were regarded as positive perception while below were considered as negative perception. The perception of the patients regarding the infrastructure and appearance of the pharmacy was positive while that regarding the pharmacists' communication and pharmacists' efforts to solve patients' medication related problems were negative (Table 2). Over 40.0 % of the participants reported waiting for >20 min before been attended to by the pharmacists; and about 25.0 % participants reported 15–20 min duration of the pharmacist–patient interpersonal interaction (Fig. 1).

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy for factor analysis was 0.933; and the Bartlett's

Table 1 Socio-demographic characteristics of the participants, n = 1,617

Characteristics	Frequency	Percent (%)
Sex		
Male	541	33.5
Female	1,058	65.4
Not indicated	18	1.1
Age		
<15	6	0.4
15–20	78	4.8
21–25	221	13.7
26–30	384	23.7
31–35	351	21.7
36–40	274	16.9
41 and above	293	18.1
Not indicated	10	0.6
Educational status		
None	87	5.4
Primary	333	20.6
Secondary	908	56.1
University	221	13.7
Postgraduate	33	2.0
Not indicated	35	2.2
Marital status		
Single	321	19.9
Married and living together	974	60.2
Living as married	43	2.7
Separated	44	2.7
Divorced	43	2.7
Widowed	160	9.9
Not indicated	32	2.0
Employment status		
Students	91	5.6
Civil servants	251	15.5
Private sector employee	159	9.8
Self-employed	765	47.3
Unemployed	220	13.6
Others	83	5.1
Not indicated	48	3.0
Average monthly income (Naira)		
<5,000	405	25.0
5,000–10,000	311	19.2
11,000–15,000	176	10.9
16,000–20,000	137	8.5
>20,000	271	16.8
Not indicated	317	19.6

test of sphericity was statistically significant ($p = 0.000$) indicating that factor analysis was useful for the data. The internal consistency of the 34-items scale based on standardized items as measured by Cronbach's alpha was 0.9050; and the average measures of ICC was 0.9050 (95 % CI 0.8983–0.9115), $p = 0.000$). Following the list-wise deletion of missing values, 1,298 cases were left for factor analysis. Using the criterion of an eigenvalue >1.0, seven factors were extracted which accounted for 57.9 % of variance. The large first factor accounted for 26.3 % of the variance. The second to seventh factors accounted for 10.7, 6.9, 4.9, 3.5, 2.9, and 2.7 % of the variance, respectively. However, the scree plot indicated a break after the seventh factor (eigenvalue = 0.900). All except one item had one factor loading of 0.40 or greater (Table 3).

Patients' satisfaction

The midpoint of the 5-point scale for patients' satisfaction of the pharmacy and pharmaceutical care received was 3.5. The participants rating of satisfaction with the waiting time before been attended to was negative while the overall quality of services received was rated as positive (Table 4). The majority of participants (about 90 %) reported that they got the kind of pharmacy services they wanted and would recommend them to others in need of similar service (Fig. 2). Of the participants, 861 (56.2 %) reported that almost all of their needs were met by the services they received in the pharmacy, 573 (37.4 %) reported that most of their needs were met, 66 (4.3 %) reported that only a few of their needs were met, while 31 (2.0 %) participants reported that none of their needs were met.

Of the participants, 1,010 (62.9 %) reported that they got all the medications they needed from the pharmacy all of the time, 472 (29.4 %) of them reported most of the time, 74 (4.6 %) reported sometimes, 15 (0.9 %) reported rarely; and 36 (2.2 %) reported that they never got all the required medications from the pharmacy. Of the participants, 1,445 (98.2 %) of them reported that they would come back to the pharmacy if they were to seek help again whereas 27 (1.8 %) participants reported otherwise. However, the overall rating of the participants' level of satisfaction with the services they received in the pharmacy was 845 (55.7 %) very satisfied, 286 (18.8 %) mostly satisfied, 63 (4.2 %) indifferent or mildly satisfied, 277 (18.2 %) mostly dissatisfied, and 47 (3.1 %) quite dissatisfied. The level of satisfaction was found to be associated with educational status of the participants ($p = 0.006$) unlike age, monthly income, sex, marital and employment status ($p > 0.05$). The increasing educational status of participants was associated with decreasing level of satisfaction.

Discussion

The participants' rating of satisfaction with the waiting time to access pharmaceutical care-based services was

Table 2 Frequency distribution of the participants' responses to the questionnaire items

Questions	Mean (SD)	Frequency (%)					Total (N)
		Strongly agree	Agree	Unsure	Dis-agree	Strongly disagree	
Pharmacists' communication	1.6 (0.1)						
You understood the pharmacist instruction every time	1.6 (0.6)	1 (0.1)	14 (0.9)	27 (1.7)	823 (52.0)	719 (45.4)	1,584
The pharmacist allowed you to ask questions	1.5 (0.6)	8 (0.5)	10 (0.6)	22 (1.4)	759 (47.7)	791 (49.7)	1,590
The pharmacist used simple understandable language when explaining your medication use	1.6 (0.6)	10 (0.6)	12 (0.8)	20 (1.3)	779 (49.1)	765 (48.2)	1,586
The pharmacist showed readiness to listen and answer your questions	1.5 (0.7)	14 (0.9)	15 (0.9)	21 (1.3)	713 (45.0)	820 (51.8)	1,583
The pharmacist used teaching aid to make you understand and remember the instruction been given	1.9 (1.0)	59 (3.7)	108 (6.9)	78 (4.9)	758 (48.1)	573 (36.4)	1,576
You understood the pharmacist response to your question(s) every time	1.6 (0.7)	18 (1.2)	30 (1.9)	31 (2.0)	787 (50.3)	698 (44.6)	1,564
The pharmacist labeled the medication	1.7 (0.9)	43 (2.8)	64 (4.1)	37 (2.4)	630 (40.4)	785 (50.4)	1,559
Medication use information	3.5 (1.2)						
The pharmacist told you the potential drug–drug; drug–food interactions	4.2 (1.0)	670 (42.2)	686 (43.3)	72 (4.5)	119 (7.5)	39 (2.5)	1,586
The pharmacist told you the best storage condition for the drug at home	4.2 (1.1)	632 (40.0)	763 (48.3)	73 (4.6)	65 (4.1)	44 (2.8)	1,579
The pharmacist told you the expected benefits of your drugs	4.3 (0.9)	771 (48.9)	685 (43.4)	30 (1.9)	58 (3.7)	34 (2.2)	1,578
The pharmacist told you the potential adverse effects/ side effects of your medications	4.3 (0.9)	738 (46.7)	699 (44.2)	44 (2.8)	59 (3.7)	41 (2.6)	1,581
The pharmacist told you the medication name	4.0 (1.2)	680 (42.7)	617 (38.8)	63 (4.0)	129 (8.1)	103 (6.5)	1,592
The pharmacist demonstrated to you how to open or close the medication containers	1.9 (1.0)	58 (3.7)	105 (6.7)	73 (4.6)	663 (42.0)	679 (43.0)	1,578
The pharmacist told you what to do when you miss your dose	2.0 (1.1)	94 (5.9)	114 (7.2)	96 (6.1)	640 (40.4)	640 (40.4)	1,584
The pharmacist told you how to know if your medication is working	4.3 (0.9)	749 (47.3)	659 (41.6)	51 (3.2)	86 (5.4)	40 (2.5)	1,585
The pharmacist told you how and when to take your drugs	4.5 (0.6)	865 (54.3)	703 (44.1)	13 (0.8)	5 (0.3)	8 (0.5)	1,594
The pharmacist told you when to come back for a medication refill	1.4 (0.7)	19 (1.2)	14 (0.9)	18 (1.1)	550 (34.7)	984 (62.1)	1,585
Pharmacists' commitment and respect for patients	2.3 (1.5)						
The pharmacist discussed your health issues with you	4.3 (0.8)	737 (46.2)	759 (47.6)	22 (1.4)	56 (3.5)	20 (1.3)	1,594
The pharmacist showed commitment to helping you address your health issues	4.4 (0.7)	805 (50.6)	725 (45.6)	25 (1.6)	26 (1.6)	10 (0.6)	1,591
The pharmacist corrected your mistakes, misconceptions or myths with respect	1.6 (0.7)	12 (0.8)	30 (1.9)	24 (1.5)	750 (47.0)	780 (48.9)	1,596

Table 2 continued

Questions	Mean (SD)	Frequency (%)					Total (N)
		Strongly agree	Agree	Unsure	Dis-agree	Strongly disagree	
The pharmacist accorded you the desired respect during interaction	1.5 (0.6)	9 (0.6)	9 (0.6)	20 (1.3)	746 (46.9)	806 (50.7)	1,590
The pharmacist told you the health improvement steps you need to take apart from your medication	1.8 (0.9)	46 (2.9)	71 (4.5)	35 (2.2)	767 (48.3)	668 (42.1)	1,587
Pharmacists' availability to attend to you	3.6 (0.2)						
The pharmacist seem to be in a hurry when discussing with you	3.7 (1.3)	172 (10.8)	202 (12.7)	123 (7.7)	565 (35.6)	526 (33.1)	1,588
You have ever been to the pharmacy and met the pharmacist's absence	3.8 (1.4)	159 (9.9)	228 (14.3)	54 (3.4)	511 (32.0)	646 (40.4)	1,598
The pharmacist sometimes cannot provide the answer to your questions due to hurriedness	3.4 (1.4)	207 (13.3)	315 (20.2)	120 (7.7)	420 (26.9)	500 (32.0)	1,562
Confidentiality and waiting time	3.4 (0.6)						
There is a private area for discussion with the pharmacist	3.8 (1.3)	525 (33.3)	658 (41.7)	64 (4.1)	161 (10.2)	170 (10.8)	1,578
You do not have any reason to believe that your issues were discussed with any other person	3.7 (1.4)	529 (33.6)	587 (37.2)	112 (7.1)	80 (5.1)	268 (17.0)	1,576
You have to wait long hours to see the pharmacist	2.8 (1.4)	348 (21.9)	466 (29.4)	136 (8.6)	435 (27.4)	202 (12.7)	1,587
Pharmacists' efforts to solve your medications related problems	1.8 (0.2)						
The pharmacist helped/offered advice when you missed your dose	2.1 (1.0)	81 (5.2)	68 (4.3)	216 (13.8)	699 (44.6)	502 (32.1)	1,566
The pharmacist offered advice/care when you reacted adversely to your medication	1.7 (0.8)	10 (0.7)	33 (2.2)	123 (8.1)	627 (41.4)	722 (47.7)	1,515
The pharmacist counseled you on the importance of keeping to your dosage regimen	1.7 (0.8)	20 (1.3)	37 (2.4)	53 (3.4)	795 (50.5)	669 (42.5)	1,574
Infrastructure and appearance of the pharmacy	4.1 (0.2)						
The shelves and table are well arranged	4.2 (0.8)	553 (34.8)	916 (57.6)	31 (1.9)	72 (4.5)	19 (1.2)	1,591
The environment and the shelves are usually clean	4.3 (0.8)	630 (39.4)	876 (54.8)	30 (1.9)	39 (2.4)	24 (1.5)	1,599
The space within the pharmacy is adequate for all activities going on there	3.9 (1.1)	462 (29.0)	828 (51.9)	41 (2.6)	180 (11.3)	83 (5.2)	1,594

negative. The level of satisfaction among participants decreases with increasing waiting time to access pharmaceutical services. This is consistent with previous reports that patient satisfaction with health care was associated with organizational factors particularly waiting time, and the availability of drugs [25, 30, 31]. The physical appearance of the pharmacy was perceived by participants as positive. This may be expected as the study interventions included infrastructural upgrades of these pharmacies.

The satisfaction with the overall quality of pharmaceutical services received by participants was rated as positive. Majority of the participants (about 90 %) got the kind of pharmaceutical services they wanted and would recommend them to others in need of similar service. This is contrary to a previous report of low satisfaction with pharmaceutical services in Nigeria [19].

The establishment and maintenance of professional relationship between the pharmacist and the patient is an

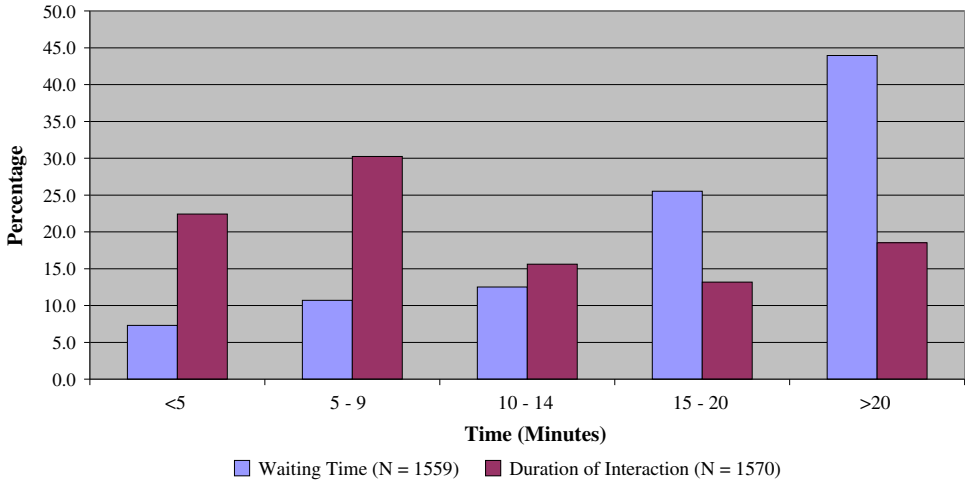

Fig. 1 Waiting time and the duration of pharmacist–patient interpersonal interactions

essential step in the provision of pharmaceutical care. This relationship is based upon trust, caring, open communication, mutual respect, cooperation, and mutual decision making; and the patients' welfare is paramount [32, 33]. This is consistent with the study findings in many instances. However, there are some findings that were contrary to this standard practice. For example, majority of the participants reported that the pharmacists neither accorded them the desired respect nor correct their mistakes, misconceptions or myths with respect; and also were not allowed to ask questions. Pharmacists' communication was rated very low although good communication is extremely important factor in providing pharmaceutical care. These are some areas of gap needing further intervention for improvement by the pharmacists. Effective communication is an important subject that must be included in continuing pharmacy educational programs aimed at improving pharmaceutical care in this setting. Satisfied patients have a more positive relationship with their health care provider, and are also more likely to continue to use health care services and remain adherent to medical regimens [13, 21–25]. Almost all the participants reported that they would come back to the pharmacy if they were to seek help again.

The provision of medication use information is among the fundamental professional responsibilities of pharmacists in health systems; and is an integral part of pharmaceutical care [34]. The perception of the participants regarding the medication use information provided by pharmacists was positive except for demonstration of how to open or close medication containers, information regarding missed doses and the medication refill process. This is contrary to previous report that patients' areas of dissatisfaction with pharmaceutical services included lack of description about ART drugs [25]. The pharmacists must perceive and evaluate the medication information needs of the patients, effectively address them, appropriately communicate and apply the information to the patient care situation [34, 35]. The three major pharmaceutical care functions included: identifying potential and actual medication related problems; resolving actual medication related problems; and preventing potential medication related problems [33]. However, the perception of the participants regarding the pharmacists' efforts to solve patients' medication related problems were negative. Interventions targeted at improving the pharmacists' knowledge and skills needed to effectively perform this function are very imperative. Over one-half of the participants were dissatisfied by the duration of interaction with the pharmacist (<10 min). This is consistent with previous reports in Nigeria [19] and in Ethiopia [25]. High patient load may be the cause of long waiting time to receive pharmaceutical care-based services; and may adversely affect the duration of interaction between pharmacist and the patient. In addition, the pharmacy is often times the last service delivery point that patients will access in the hospital. Long waiting times in other service delivery points in the hospital will tend to build up stress such that by the time the patient meets the pharmacist he/she is often times ill-tempered, impatient and only just wants to pick up his medication. This may adversely affect the quality of pharmaceutical care-based services rendered to the patients. Majority of the participants reported receiving all the medications they needed from the pharmacy. This has been reported previously in HIV treatment setting in Ethiopia [25]. The level of satisfaction was found to be associated with educational status of the participants unlike age, marital and employment status, sex, and monthly income. The study findings showed that the higher educational status of the participants the lesser the level of satisfaction. The level of expectations from the healthcare

Table 3 The factor loading the question items, N = 1,298

	Factor						
	1	2	3	4	5	6	7
Pharmacists' communication							
You understood the pharmacist instruction every time	0.772	–	–	–	–	–	–
The pharmacist allowed you to ask questions	0.762	–	–	–	–	–	–
The pharmacist used simple understandable language when explaining your medication use	0.650	–	–	–	–	–	–
The pharmacist showed readiness to listen and answer your questions	0.640	–	–	–	–	–	–
The pharmacist used teaching aid/technique to make you understand and remember the instruction been given	−0.615	–	–	–	–	–	0.423
You understood the pharmacist response to your question(s) every time	0.556	–	–	–	–	–	–
The pharmacist labeled the medication	−0.555	–	–	–	–	0.448	–
Medication use information							
The pharmacist told you the potential drug–drug; drug–food interactions	–	0.673	–	–	–	–	–
The pharmacist told you the best storage condition for the drug at home	–	0.642	–	–	–	–	–
The pharmacist told you the expected benefits of your drugs	–	0.634	–	–	–	–	–
The pharmacist told you the potential adverse effects/side effects of your medications	–	0.624	–	–	–	–	–
The pharmacist told you the medication name	–	−0.623	–	–	–	–	–
The pharmacist demonstrated to you how to open or close the medication containers	–	−0.536	–	–	–	–	–
The pharmacist told you what to do when you miss your dose	–	−0.513	–	–	–	0.432	–
The pharmacist told you how to know if your medication is working	–	0.462	0.568	–	–	–	–
The pharmacist told you how and when to take your drugs	−0.410	0.455	–	–	–	–	–
The pharmacist told you when to come back for a medication refill	–	–	–	–	–	–	–
Pharmacists' commitment and respect for patients							
The pharmacist discussed your health issues with you	–	–	0.676	–	–	–	–
The pharmacist showed commitment to helping you address your health issues	−0.435	–	0.641	–	–	–	–
The pharmacist corrected your mistakes, misconceptions or myths with respect	–	–	−0.630	–	–	–	–
The pharmacist accorded you the desired respect during interaction	0.448	–	−0.614	–	–	–	–
The pharmacist told you the health improvement steps you need to take apart from your medication	0.401	–	−0.483	–	–	–	–
Pharmacists' availability to attend to you							
The pharmacist seem to be in a hurry when discussing with you	–	–	–	0.800	–	–	–
You have ever been to the pharmacy and met the pharmacist's absence	–	–	–	0.741	–	–	–
The pharmacist sometimes cannot provide the answer to your questions due to hurriedness	–	–	–	0.740	–	–	–
Confidentiality and waiting time							
There is an area for private discussion with pharmacist	–	–	–	–	0.730	–	–
You do not have any reason to believe that your issues were discussed with any other person	–	–	–	–	0.702	–	–
You have to wait long hours to see the pharmacist	–	–	–	–	0.639	–	–
Pharmacists' efforts to solve your medications related problems							
The pharmacist helped/offered advice when you missed your dose	–	–	–	–	–	0.603	–
The pharmacist offered advice/care when you reacted adversely to your medication	–	–	–	–	–	−0.471	–
The pharmacist counseled you on the importance of keeping to your dosage regimen	–	–	–	–	–	0.416	–
Infrastructure and appearance of the pharmacy							
The shelves and table are well arranged	–	–	–	–	–	–	0.844

Table 3 continued

	Factor						
	1	2	3	4	5	6	7
The environment and the shelves are usually clean	–	–	–	–	–	–	0.743
The space within the pharmacy is adequate for all the activities going on there	–	–	–	–	–	–	0.691

Rotation converged in eight iterations; factor < 0.400

Extraction Method principal component analysis, *Rotation Method* varimax with Kaiser normalization, *SD* standard deviation

Table 4 Participants rating of the services they received from the pharmacies

Overall, how would you rate the service(s) you received from this pharmacy?	Mean (SD)	Frequency (%)					Total (N)
		Poor	Unsatisfactory	Satisfactory	Good	Excellent	
Waiting time	2.7	341	268	547	319	101	1,576
	(1.2)	(21.6)	(17.0)	(34.7)	(20.2)	(6.4)	
Privacy and space for consultation	3.2	181	162	568	436	220	1,567
	(1.2)	(11.6)	(10.3)	(36.2)	(27.8)	(14.0)	
Information/education materials	3.5	114	117	477	551	306	1,565
	(1.1)	(7.3)	(7.5)	(30.5)	(35.2)	(19.6)	
Interaction with the pharmacist	4.1	11	31	392	526	608	1,568
	(0.9)	(0.7)	(2.0)	(25.0)	(33.5)	(38.8)	
Quality of service you received	4.0	11	36	351	413	488	1,299
	(0.9)	(0.8)	(2.8)	(27.0)	(31.8)	(37.6)	

system by patients who are highly educated may be higher than those who are less educated and probably less informed. This is contrary to previous reports that socio-demographic characteristics of patients had no association with their level of satisfaction [19, 25].

The internal consistency of the 34-items scale was excellent [36] and superior to 0.70 indicating that the items are sufficiently correlated to constitute a scale [37]. This was corroborated by ICC value that indicated good agreement of items in the scale [38]. Reliabilities of 0.95 or greater are not necessarily desirable, as this indicates that the items may be entirely redundant [39]. All items in the scale (except one item) had significant loadings of 0.40 or greater which may indicate that the extracted factors represented the variables well [29].

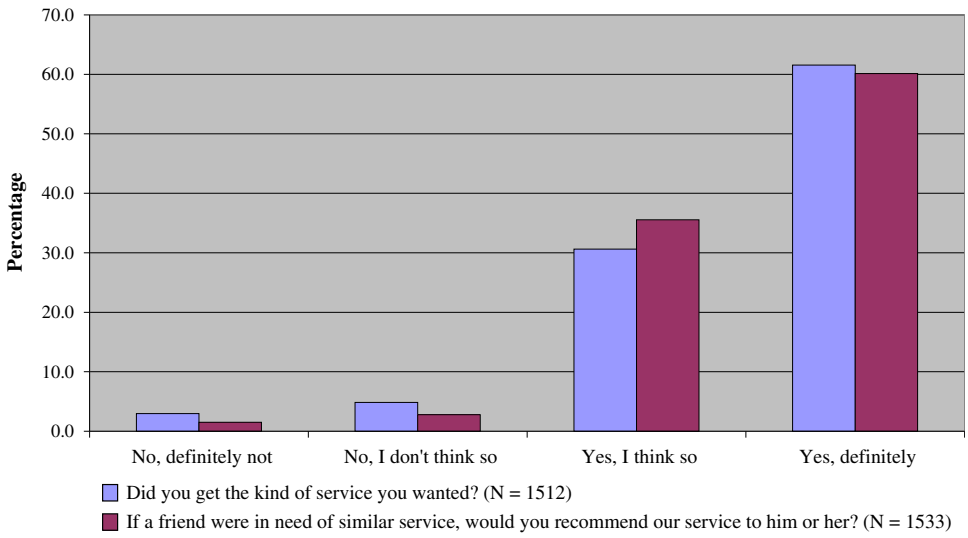

Fig. 2 Participants' overall perception about the pharmacy services

There were limitations to this study. Some participants may falsely report high/low level of satisfaction to pharmaceutical care-based services to impress/despise the pharmacist (response bias). This may overestimate/underestimate the effects been measured in this study. There may be recall bias when responding to the questionnaire items in the instrument. This has the potential to either overestimate or underestimate the patients' perception and satisfaction with pharmaceutical services. Only patients who received pharmaceutical care-based services for at least 6 months duration were selected for the study. The exclusion of patients who received pharmaceutical care-based services for <6 months duration may be a source of potential bias which may overestimate/underestimate the effects been measured in this study.

Conclusion

The satisfaction with the overall quality of pharmaceutical services received by participants was rated as positive. Patients were satisfied with the appearance of the pharmacy in the health facilities and would come back to the pharmacy if they were to seek help again. However, longer waiting times resulted in lower patient satisfaction; and patients were dissatisfied by the duration of interaction with the pharmacist. High patient load may be the cause of long waiting time to receive pharmaceutical services; and may adversely affect the duration of interaction between pharmacist and the patient.

Acknowledgments We wish to acknowledge all staff of HU PACE in Nigeria and USA who have supported in the implementation of the pharmacy component of the GHAIN Project. We also acknowledge the contribution of focal pharmacists who supported the direct provision of pharmaceutical care to patients in the health facilities.

Funding Support for this paper was provided by Global HIV/AIDS Initiative in Nigeria (GHAIN) with funds from the US President's Emergency Plan for AIDS Relief (PEP-FAR) through US Agency for International Development (USAID) Cooperative Agreement No. 620-A-00-04- 00122-00. The views expressed in this publication are that of the authors and do not necessarily reflect those of FHI360 and Howard University Pharmacists and Continuing Education (HU PACE) Center.

Conflicts of interest The author(s) declare that they have no competing interests.

References

1. Erah PO, Chuks-Eboka NA. Patients' perception of the benefits of pharmaceutical care services in the management of hypertension in a tertiary health care facility in Benin City. Trop J Pharm Res. 2008;7(1):897–905.
2. Donabedian A. The role of outcomes in quality assessment and assurance. Qual Rev Bull. 1992;18:356–60.
3. Ford RC, Bach SA, Fottler MD. Methods of measuring patient satisfaction in health care organizations. Health Care Manage Rev. 1997;22:74–89.
4. Rosenthal GE, Shannon SE. The use of patient perceptions in the evaluation of health-care delivery systems. Med Care. 1997; 35(11 Suppl):NS58–68.
5. Rossiter L, Langwell K, Wan T, Rivnyak M. Patient satisfaction among elderly enrollees and disenrollees in Medicare health maintenance organizations. Results from the National Medicare Competition Evaluation. JAMA. 1989;262:57–63.
6. Ware JE, Snyder MK, Wright WR, et al. Defining and measuring patient satisfaction with medical care. Eval Prog Plan. 1983;6: 247–63.
7. Larson LN, Rovers JP, MacKeigan LD. Patient satisfaction with pharmaceutical care: update of a validated instrument. J Am Pharm Assoc. 2002;42:44–50.
8. Sitzia J, Wood N. Patient satisfaction: a review of issues and concepts. Soc Sci Med. 1997;45:1829–43.
9. Schommer JC, Kucukarslan SN. Measuring patient satisfaction with pharmaceutical services. Am J Health Syst Pharm. 1997;54: 2721–32.
10. Hepler C, Strand L. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm. 1990;47:533–43.
11. King RC, Fomundam HN. Remodeling pharmaceutical care in Sub-Saharan Africa (SSA) amidst human resources challenges and the HIV/AIDS pandemic. Int J Health Plann Manage. 2010; 25:30–48.
12. Oparah AC. Pharmaceutical care concept, philosophy, competency and benefits. In: Oparah AC, editor. Essentials of pharmaceutical care. Lagos, Nigeria: ACybex publication; 2010. p. 21–39. ISBN: 9789783840195.
13. Volume CI, Farris KB, Kassam R, Cox CE, Cave A. Pharmaceutical care research and education project: patient outcomes. J Am Pharm Assoc. 2001;41(3):411–20.
14. Erah PO, Nwazuoke JC. Identification of standards for pharmaceutical care in Benin City. Trop J Pharm Res. 2002;1(2):55–66.
15. Farris KB, Llimos FF, Benrimoj S. Pharmaceutical care in community pharmacies: practice and research from around the world. Ann Pharmacother. 2005;39(9):1539–41.
16. Swift BG. Barriers to pharmaceutical care in the home care setting. Am J Hosp Pharm. 1993;50:1611–4.
17. Oparah AC, Eferakeya AE. Attitudes of Nigerian pharmacists towards pharmaceutical care. Pharm World Sci. 2005;27(3):208–14.
18. Andaleeb SS. Service quality perceptions and patient satisfaction: a study of hospitals in a developing country. Soc Sci Med. 2001; 52(9):1359–70.
19. Oparah AC. Enato EFO and Akoria OA. Assessment of patient satisfaction with pharmaceutical services in a Nigerian teaching hospital. Int J Pharm Pract. 2004;12:7–12. doi:10.1211/0022357023204.
20. Hanan M, Karp P. Customer satisfaction: how to maximize, measure, and market your company's "ultimate product". New York, NY: American Management Association; 1989. p. 7. ISBN-10: 0814477720.
21. Marquis M, Davies A, Ware J. Patient satisfaction and change in medical care provider: a longitudinal study. Med Care. 1983;21: 821–9.
22. Ware J, Wright W, Snyder M, et al. Consumer perceptions of health care services: implications for academic medicine. J Med Educ. 1975;50:839–48.
23. Ross C, Frommelt G, Hazelwood L. The role of expectations in patient satisfaction with medical care. J Health Care Mark. 1987; 7:16–26.
24. Bartlett E, Grayson M, Barker R. The effects of physician communication skills on patient satisfaction, recall and adherence. J Chronic Dis. 1984;37:755–64.

25. Karunamoorthi K, Rajalakshmi M, Makesh Babu S, Yohannes A. HIV/AIDS patient's satisfactory and their expectations with pharmacy service at specialist antiretroviral therapy (ART) units. Eur Rev Med Pharmacol Sci. 2009;13:331–9.
26. Nunnally JC. Psychometric theory. New York: McGraw-Hill; 1978. ISBN: 0070474656, 9780070474659.
27. Field A. Discovering statistics using SPSS for windows. London–Thousand Oaks–New Delhi: Sage; 2000. p. 446. ISBN: 0761957545.
28. Stewart DW. The application and misapplication of factor analysis in marketing research. J Mark Res. 1981;18:51–62.
29. Hair JF, Anderson RE, Tatham RL. Multivariate data analysis. 2nd ed. New York: Macmillan; 1987. p. 149.
30. Probst JC, Greenhouse DL, Selassie AW. Patient and physician satisfaction with an outpatient care visit. J Fam Pract. 1997;45:418–25.
31. Abdosh B. The quality of hospital services in eastern Ethiopia: patient's perspective. Ethiop J Health Dev. 2006;20:199–200.
32. American Pharmacists Association (APhA). Principles of practice for pharmaceutical care. 2005. http://www.pharmacist.com/principles-practice-pharmaceutical-care. Accessed 20 May 2013.
33. American Society of Hospital Pharmacists. ASHP statement on pharmaceutical care. Am J Hosp Pharm. 1993;50:1720–3.
34. American Society of Health-System Pharmacists. ASHP guidelines on the provision of medication information by pharmacists. Am J Health-Syst Pharm. 1996;53:1843–5.
35. Troutman WG. Consensus-derived objectives for drug information education. Drug Inf J. 1994;28:791–6.
36. George D, Mallery P. SPSS for windows step by step: a simple guide and reference. 11.0 update. 4th ed. Boston: Allyn and Bacon; 2003. p. 231. ISBN: 0205375529, 9780205375523.
37. Streiner DL, Norman GR. Health measurement scales: a practical guide to their development and use. Oxford: Oxford University Press, 2008. ISBN: 0199231885, 9780199231881.
38. Portney LG, Watkins MP. Foundations of clinical research applications to practice. New Jersey: Prentice Hall; 2000. p. 560–7. ISBN: 0838526950, 9780838526958.
39. Streiner DL. Starting at the beginning: an introduction to coefficient alpha and internal consistency. J Pers Assess. 2003;80:99–103.