ORIGINAL RESEARCH

Patient Satisfaction with Antiretroviral Therapy Services in Hadiya Zone, Central Ethiopia Using the Donebidean Model: A Time-Motion Study

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Background: A time-motion study is a scientific method for recording time spent on various tasks in a narrow range of specialized work settings, beginning with initial enrollment in ART provision. Therefore, the study aimed to assess the time motion of patient satisfaction with antiretroviral therapy services in Central Ethiopia.

Methods: A facility-based cross-sectional study was conducted on a sample of 422 patients from June 14 to July 30, 2021. We used a simple random sampling technique to select the participants. Structural input-related qualitative data were collected using an in-depth interview and used for concurrent triangulation with quantitative. Quantitative data were collected using a standardized and pre-tested questionnaire and analyzed using SPSS version 24.0. Bivariate and multivariable logistic regressions were used to identify independent predictors of time motion and patient satisfaction. The degree of association between the outcome and independent variables was assessed by using an odds ratio with a 95% CI.

Results: The time motion of patient satisfaction study found that 53.1% (224/422) of the study participants were satisfied. As independent predictors, time spent (time motion) waiting to be seen by a health professional (AOR = 0.228, 95% CI = 0.079–0.661), patient-provider interaction (AOR = 3.72, 95% CI = 2.111–5.771), perceived privacy (AOR = 2.912, 95% CI = 1.76–2.78), sex (AOR = 2.499, 95% CI = 1.556–4.009), and income class (AOR = 0.228, 95% CI = 0.073–0.707) were associated with outcome variable.

Conclusion: The study found low patient satisfaction with ART services, indicating the need for further improvement to enhance patient-centered services with the given time motion. Therefore, further research is needed to assess the intensity and reach of the information through an analysis of pre- and post-intervention that provides a complete picture of conceptualizations of time motion studies.

Keywords: ART, patient satisfaction, time motion, Central Ethiopia

Introduction

Advocating for the human immunodeficiency virus (HIV) is still a critical issue for the world, as HIV/AIDS has infected a total of 77.3 million people worldwide.[1–4] According to the 2016 Ethiopian Demographic and Health Survey (EDHS) main findings on AIDS in Ethiopia, the national HIV prevalence rate among adults is expected to be 0.9%, with 2.9% in urban areas and 0.4% in rural areas.[4,5] As a result, antiretroviral therapy (ART) has become an important aspect of HIV treatment[4,6–8] and also significantly lowered the rate of HIV transmission from mother to child.[9–12] According to a study conducted in one region of Ethiopia, low education and migratory status are factors in HIV infection.[4] Furthermore, coverage of HIV services varies by demographic and region.[5] HIV epidemics in specific areas may originate or re-emerge if these sub-regions and subpopulations are not addressed. Over the past ten years, Ethiopia has made impressive strides toward managing the HIV/AIDS epidemic. Nonetheless, compared to less than one percent nationwide, prevalence is still comparatively high in metropolitan regions, where estimates place the rate at three percent.[4,5]

Timely treatment of patients has made a significant difference in adherence to the developed and developing world.[13–15] The world believes that increasing waiting time in outpatient departments (OPDs) has a negative impact on patient

satisfaction; therefore, prompt patient care and adopting a compassionate and considerate approach to improving patient satisfaction will have a positive impact on service delivery. To this end, patient waiting times are increasingly important to a clinic's ability to attract new clients in the competitive managed care environment. When patients are unhappy with the length of the waiting time, it is difficult to offer services.[16–19] To solve this problem, many efforts have been made by the government of Ethiopia.[3,4,20] The current state of the quality of ART services in health facilities is still seen to have different types of quality-related issues. Patient satisfaction to the level of best, which has gaps, is not definitely assessed.

Tested theories are prudent in describing the behavioural situations of individuals and groups, as well as organizations in one squad.[21,22] Thus; this study uses the Donebidean model to assess the time motion of patient satisfaction with ART service utilization. The Donebidean model is a conceptual framework for investigating health services and assessing healthcare quality. The approach divides quality of care information into three categories: "structure", "process", and "outcomes". The model represents the concept of input, process, and output elements that influence patient satisfaction. In the paradigm, input components are the health institution's structural and physical setting, while process factors include patient-doctor contact and therapy. Whereas, output factors are the result of the input and process factors. The true application of the model links the input, process, and output in a connected manner.[23–27] In other words, since patient satisfaction is the best predictor of the health service process of the patient, the input and process factors are still the question in Ethiopia since the knowledge we have at hand is inconclusive and abstract. That is why the Donebidean model was applied to look into the factors affecting patient satisfaction with ART services. Therefore, the study aimed to assess the time motion of patient satisfaction with antiretroviral therapy services in Hadiya Zone, Central Ethiopia, using the Donebidean Model (Figure 1).

Materials and Methods
Study Design, Participants and Study Setting
A facility-based cross-sectional study was conducted on a sample of 422 patients from June 14, to July 30, 2021. Source populations were all adult (age 18 years and above) people living with HIV/AIDS (PLWHA) who are receiving
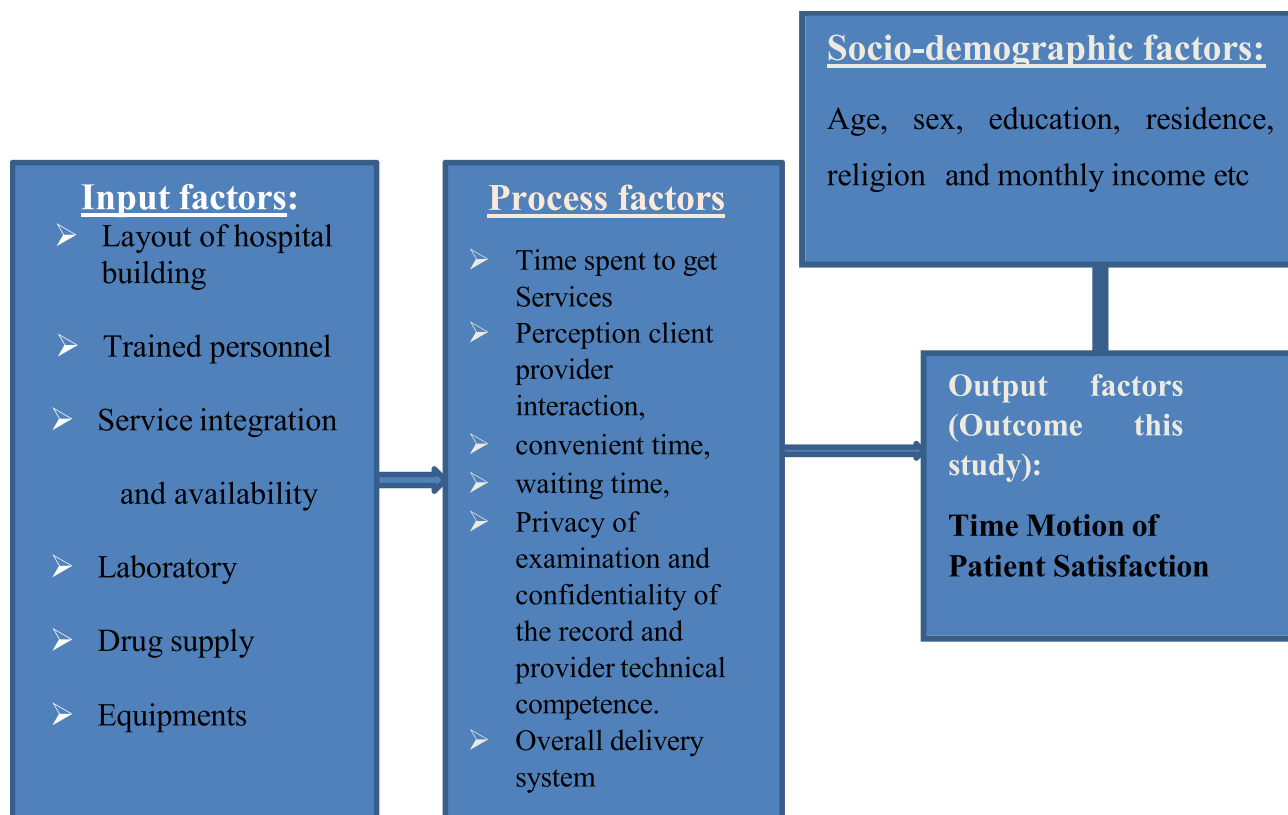

Figure 1 Conceptual framework of time-motion of patient satisfaction with antiretroviral therapy services in Hadiya Zone, Central Ethiopia using Donebidean model.

antiretroviral therapy services from governmental hospitals in the Hadiya zone. Sample populations were adult patients on ART whose ages were 18 and above. All adult patients who had been on ART for less than three months, were 18 years of age or older, had hearing difficulties, or had mental problems were excluded from the study. The study was conducted in the central part of Ethiopia, in Hadiya zone health facilities.

The Hadiya zone is one of the zones in Central Ethiopia. Its capital city is Hossana, and it is located at a distance of 230km from Addis Ababa. The zone has thirteen rural towns and eight administrative towns. There are three primary hospitals and one comprehensive specialized hospital. Those are Wachemo University Nigist Elleni Mohammed Memorial Comprehensive Hospital, Homecho, Shone, and Ginbichu primary hospitals. Then, all of them provide ART services to people living with HIV/AIDS (PLWHA). The number of ART service users at Wachemo University Nigist Elleni Mohammed Memorial Comprehensive hospital, Homecho, Shone and Ginbichu Hospitals is 1250, 36, 150 and 69 patients respectively.[15] In the Zone, currently, the number of people living with HIV/AIDS (PLWHA) is 2350, many of whom were on ART. The chronology of ART client's movement from entering to facility and exiting the facility varies from hospital to hospital depending on type and level of hospital. However, all hospitals use separate outpatient department and treatment set-up to increase patient privacy and confidentiality, and to reduce stigma and discrimination.

Sample Size Determination and Sampling Procedure

The sample size was calculated by using a single population proportion and considering the following assumptions: P = 50% (assuming a proportion of patients who are treated ART timely), marginal error (d) of 5%, confidence interval of 95%, and Z α/2 is the value of the standard normal distribution corresponding to a significant level of alpha (α) 0.05, which is 1.96. Finally, to account for contingencies such as non-response or recording error, the sample size was increased by 10%, resulting in 384 x 10/100 + 384 = 422. For sampling, the enumerated lists of Art patients' were obtained from the record office all the four hospitals. Then, all four hospitals were included in the study, and from each hospital, sample households were chosen using a simple random sampling technique using a sampling frame. For qualitative, criterion related sampling technique was used to conduct six in-depth interviews with health workers and five with clients to collect information about the structural variables and some of the process data.

Measurement of Variables

The outcome of this study is the time motion of patient satisfaction with ART services. Patient satisfaction is the patients' care received from ART service delivery points and staff, which is computed by adding the satisfaction parameters captured through the five-point Likert scale. Respondents who fall within the mean score and above are considered satisfied. The existing situation of the health facility concerning input factors such as the minimum clinical package, the minimum pharmacy package, and the laboratory minimum package were assessed on 16 items. The exposure variables were socio-demographic factors such as age, religion, ethnicity, educational status, occupational status, and income, which were assessed with 10 items. Patient satisfaction with ART treatment services was assessed with 18 items. This questionnaire is graded by taking a percentage of the total score and categorizing it as either good or poor satisfaction. Participants in the study who scored mean were thought to have good satisfaction. Those who scored below the mean were considered to have poor satisfaction. To assess the level of satisfaction and perception of clients with each selected item, we used five Likert scales (strongly disagree, disagree, neutral, agree, and strongly agree). Finally, respondents who exclusively reported one of the three categories, namely neutral, disagree, or strongly disagree together, were considered to have not been satisfied, whereas respondents, who exclusively reported one of the two categories, namely agree or strongly agree together, were considered to have been satisfied. To gain information about structural input variables, the qualitative data collecting method was used, which involved an in-depth interview. The guideline inquires about the hospital's pleasant layout, the availability of skilled personnel, the presence and availability of service integration, and the minimum standard for laboratory setup, drug supply, and equipment. Patients and health care providers received distinct interview on time-motion and delivery style, as well as some probing questions. Respective responses were recorded with a tape recorder and handwritten notes, then analyzed based on themes.

Data Collection, Processing, and Analysis

Data were collected using structured interviewer-administered questionnaires addressing socio-demographics, the quality of service provided, and the time motion of patient satisfaction. The questionnaire was adapted and developed based on the Donebidean Model framework through a review of various relevant literatures.[21–27] Checklists were used for in-depth interviews. Questionnaires were translated into the local language and then back translated to English by another person to maintain internal consistency. A pre-test was carried out on 5% of the sample size before the actual data collection, and possible modifications of the tool were done based on the results of the pre-test. Two days of training were given for data collectors and supervisors, which focused on the aim of the study, procedures, data collection techniques, the art of interviewing, ways of collecting the data, and clarification on how to manage the data collection process. Supervisors and the principal investigator performed immediate supervision on a daily basis. Every day, the collected data was reviewed and cross-checked for completeness and relevance before data entry. The data were analyzed by SPSS Version 24.0. Prior to analysis, the data were checked for normality and homogeneity, then analyzed and interpreted by the research team. Inconsistencies and missing values were checked by running frequencies and other data explorations. Descriptive statistics like frequency distributions, mean, and standard deviation were computed. Bivariate analysis was done primarily to check which independent variables had an association with the dependent variable (time motion of patient satisfaction). Independent variables with marginal associations ($P < 0.25$) in the bivariate analysis, which are plausible and those variables showed significant association in the previous studies, were entered into a multivariable logistic regression analysis in order to detect association with the outcome variable. We used the Hosmer-Lemeshow test to check the appropriateness of the model for analysis. Finally, adjusted odds ratios (AOR) with a 95% CI were estimated to assess the strength of associations; statistical significance was declared at a p-value < 0.05.

Ethical Clearance and Consent to Participate

This study was approved and conducted per the principles of the Helsinki Declaration. Ethical clearance was obtained from the Research Ethics Review and Approval Committee (REAC) of Wachemo University with reference number Ref. No.WCU/SGS/1173/12 and Date 10/09/12 (local date in Ethiopian calendar) with unique student registration number WCU003410. A formal letter from the college of medicine and health sciences was obtained and delivered to all appropriate offices in each kebele to request authorization. Informed verbal consent was obtained from each participant after thoroughly explaining the objectives and benefits of the study. We employed verbal consent since it is preferable for routine treatments such as prophylaxis, given that full records are already maintained in health institutions, because this study is being conducted on ART patients following their treatment in health institutions. In our scenario, we depend on verbal consent because the entire client's written documents, including the name of the individual who gave the consent, are present. In our context, the ethics review committee gives a letter of permission with a reference number and date without disclosing the names of the institutional review committee, as mentioned above. The study participants were told that they have the right to withdraw at any time from the study. The participants were also informed that their responses would be kept confidential and that their names would not be mentioned. All participants' rights to self-determination and autonomy were respected. The participants were also informed that the study had no loss of benefits and discontinuing answering the question also does not harm them and no punishments at all.

Results

Socio-Demographic Characteristics

Four hundred twenty-two patients participated in the study, giving a response rate of 100%. Table 1 presents the socio-demographic and economic characteristics of respondents in Hadiya Zone, Central Ethiopia. Accordingly, the mean (±SD) age of the patients was 37.95±10.24 years. Of the total patients, 83.1% (325/422) were from Wachemo University Nigist Elleni Memorial Comprehensive Hospital, and the rest were from Shone Primary Hospital, Ginbichu Primary Hospital, and Homecho Primary Hospital. The majority, 64.5% (272/422), of the respondents were unmarried and Protestants by religion. More than three-fourths (335/422) learned for the first time from health providers about the availability of ART services (Table 1).

Table 1 Socio-Demographic Characteristics of ART Patients in the Four Hospitals in Hadiya Zone, Central Ethiopia, July 2021 (n=422)

Variable	Categories	Frequency(n)	Percentage
Sex	Female	201	45.0
	Male	221	55.0
Age in years	18–29 years	112	26.5
	30–39 years	135	32.0
	40–49 years	106	25.1
	>50 years	69	16.4
Family size	1–3	177	41.9
	3–4	168	39.8
	≥ 5	77	18.2
Religion	Protestant	165	39.1
	Orthodox	158	37.4
	Catholic	56	18.3
	Muslim	43	10.2
Marital status	Single	272	64.5
	Married & live together	101	28.2
	Married & not live with	18	4.3
	Widowed	17	4.0
	Divorce	14	3.3
Currently live with	Family	325	77.0
	Parents	46	10.4
	Alone	51	12.1
Monthly income class	<1000	143	52.3
	1000–5000	252	33.2
	5001–10,000	27	8.3
Educational status	Illiterate	34	8.1
	Unable to read and write	121	28.7
	Primary school	84	19.9
	Secondary school	69	16.4
	Higher education	114	27.0
Who told to ART service Provisions	Health professional	335	79.9
	PLWHA association	35	8.5
	Mass media	25	5.9

(*Continued*)

Table 1 (Continued).

Variable	Categories	Frequency(n)	Percentage
	Relatives	21	5.0
	Friends or others	6	1.4
Time taken to reach hospital	Less than 1/2 hour	123	29.1
	½ hour to 1 hour	190	45.0
	1hr to 2hrs	73	17.3
	More than 2 hours	35	8.3

Time Motion and Process Variables for Patient Satisfaction on ART Services

Time motion and patient satisfaction level with ART services were measured using various items like time, information, and the interaction of the patient-provider service provision dimensions. Table 2 presents time motion and process variables for patient satisfaction on art services in four hospitals in the Hadiya zone. Accordingly, the overall level of satisfaction with time motion and patient satisfaction with ART service was 53.1%. Regarding the source of information, about 335 (79.4%) heard about ART services from health professionals, whereas 35 (8.3%) of the respondents heard from PLWHA. With respect to time to reach the health facility, about 190 (45.0%) of the patients took half an hour to 1 hour, and 73 (17.3%) took 61 minutes to 2 hours (Table 2).

Table 2 Time Motion and Process Variables for Patient Satisfaction on ART Services in Four Hospitals in Hadiya Zone, July 2021 (n=422)

Variable		Satisfaction Rating			
		Very Satisfied (1)	Satisfied (2)	Neutral (3)	Dissatisfied (4)
		No (%)	No (%)	No (%)	No (%)
Time motion as a process variable	Time taken to reach hospital	151 (35.8)	116(27.5)	53(12.5)	102 (24.2)
	Duration of ART taken	114 (27.0)	167(39.6)	65(15.4)	76(18.0)
	Time spent waiting to see doctor	175 (45.5)	238(56.4)	9 (2.1)	0 (0.0)
	Time spent to get health service and get back	161 (38.5)	233(55.8)	23 (5.5)	5 (1.2)
Process variables other than time motion	Queue process to be seen by health Professional	176 (41.7)	221(52.4)	24 (5.7)	1 (0.2)
	Courtesy and respect of health Professional	188 (44.5)	201(47.6)	33(7.8)	0
	The way health professionals examine	187 (44.3)	193 (43.7)	35(8.3)	7 (1.7)
	Measures taken to assure privacy and during examination	173 (41.0)	212 (50.2)	36 (8.5)	1(0.2)
	Satisfaction of patients with availability of drugs and supplies	181 (42.9)	224 (53.1)	16 (3.8)	1 (0.2)
	Over all cleanliness and waiting area, room and compound	166 (39.3)	238 (53.1)	16 (3.8)	2 (0.5)
	Completeness of information given by health professional	165 (39.1)	227(53.8)	24 (5.7)	6 (1.4)
	Measures taken to assure confidentiality	172 (40.8)	212 (50.2)	33 (7.8)	4 (0.9)
	Getting information about all services	126 (2.9)	224 (50.1)	67(15.9)	5 (1.2)
Overall level of satisfaction regarding delivery of services		10 (2.4)	214 (50.7)	119(28.2)	79(18.7)

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Table 3 Presents Average Mean Scores Patients' Perception on Time Motion and Satisfaction in Hadiya Zone, Central Ethiopia, July 2021 (N=422)

Perception of Patients' Time Motion and Patient Interaction	Items Scale Range	Mean ± Standard Deviation
Perceived ideal time to get services	4–20	16.89 ± 3.96
Perceived convenient of opening hours	2–10	7.89 ± 0.65
Perceived client provider interaction	6–30	26.43 ± 7.54
Perceived competence of health providers	4–20	16.98 ± 6.88
Perceived availability of Services	9–45	39.76 ± 11.65
Perceived confidentiality of medical record	1–5	3.99 ± 0.95
Perceived privacy during examination	1–5	3.23 ± 1.14
Perceived knowledge on ARV drugs	5–25	20.55 ± 5.22
Perceived convenient of setting of services	2–10	6.45 ± 2.85
Overall satisfaction with time motion	30–150	105.28 ± 36.88

Patients' Perception on Time Motion of Patient Satisfaction

Table 3 presents the mean score for time motion and patients' perceptions of the process of service provision. Accordingly, the average means scores perception of convenient hours and ideal time to get services were (mean ± standard deviation) (7.89 + 0.65) and (16.89 + 3.96), respectively. In similar terms, in this study, the average mean score of overall satisfaction was (mean ± standard deviation) (105.28 ± 36.88) (Table 3).

Factors Affecting Time Motion and Patient Satisfaction on ART Services

Sex, religion, income class, family size, service hour convenience, patient-provider interaction, perceived privacy, and time spent waiting to be seen by a health professional were selected as candidates for bivariate logistic regression. However, in a multivariable logistic regression analysis, sex, income class, time spent waiting to see a health professional, patient-provider interaction, and perceived privacy had a statistically significant association with time motion and patient satisfaction with ART services. This study showed that females were found to be 2.499 times more likely to be satisfied when compared with males (AOR = 2.499, 95% CI = [1.556, 4.009]). The findings of this study indicated that high-income participants were 77.2% less likely to be satisfied than those study participants who were from low-income classes (AOR =0.228, 95% CI (0.073–0.707)). The analysis of this study also revealed that study participants who had less than 30 minutes to see a doctor were 77.2% less likely to have satisfaction than those who had greater than 30 minutes (AOR =0.228, 95% CI [0.079–0.661]). Patient-provider interaction (AOR = 3.720, 95% CI = 2.111–5.771) and perceived privacy (AOR = 2.912, 95% CI = 1.76–2.78) also had higher odds of time motion and patient satisfaction as compared to those who were not (Table 4).

Table 4 Bivariate and Multivariable Analysis of Time Motion of Patient's Satisfaction on ART Service in Four Hospitals in Hadiya Zone, Central Ethiopia, June 2012 (N=422)

Variable		Frequency (%)	COR (95% CI)	AOR (95% CI)
Sex	Male	221(52.4)	1	1
	Female	201(47.6)	3.145(1.332–3.455)	2.499(1.556–4.009)*

(Continued)

Table 4 (Continued).

Variable		Frequency (%)	COR (95% CI)	AOR (95% CI)
Income class	<1000 birr	143(13.3)	1	1
	1001–5000 birr	252(20.6)	0.363(0.138–0.953)	0.503 (0.157–1.607)
	5001–10,000 birr	27(22.5)	0.272(0.106–0.698)	0.228 (0.073–0.707)*
Perceived privacy	Mean and above	385 (91.2)	3.115(1.989–2.991)	2.912(1.760–2.781)
	Below mean	37 (8.8)	1	1
Patient-provider interaction	Mean and above	380(90.0)	4.545(2.344–6.222)	3.720(2.111–5.771)*
	Below mean	42 (10.0)	1	1
Time to see doctor	<30 minute	123(29.1)	0.154(0.057–0.419)	0.228(0.079–0.661)*
	30 to 60 minutes	190(45.0)	1.102(0.408–2.977)	1.581(0.552,4.532)
	1hr to 2hrs	73 (17.3)	2.040(1.326–3.139)	0.939(0.547–1.614)
	More than 2 hours	35 (8.3)	1	1

Note: *indicates statistically significant; 1 is for reference group.

Discussion

The health status of the individuals was determined by timely getting the required services. The perceived time may be the same as the actual time. Though this study does not only focus on the time parameter, the time motion of patient satisfaction was studied using the Donebidean model, considering various factors that the hospital requires to fulfill and deliver. Thus, the current study found that overall patient satisfaction with ART service was 53.1% (296/422). This study is lower than the patient satisfaction studies conducted in several parts of Ethiopia, such as Tigray (89.6%),[28] Addis Ababa (85.5%),[29] and Jimma (82%).[15] However, it is consistent the study conducted in Amara region.[30] This might be because satisfaction is a psychological variable that varies from place to place owing to the structure of the hospital, the interaction of health professionals, and the time it takes to get the services. The other might be in the current study; time used as a variable and calculated with other process variables might cause the variation.

Previous studies documented that the average time to stay in an outpatient department varies from country to country; pointing out that the mean waiting time was approximately less than an hour.[31–33] The present study also confirmed that time spent to see a doctor had a statistically significant association with time spent and patient satisfaction with ART services. The qualitative part also confirmed that all study hospitals fulfilled the minimum packages for the initiation of antiretroviral service. Participants also confirmed that service related organizational structure very pleasant to get services and treatment. This might be the expectation of the service obtained mostly depends on the patient's perceived expectation of the service provided with his or her time.

In this study, female patients were found to be satisfied when compared with males. This is similar to the study conducted in various parts of Ethiopia and abroad.[20,28–30] The qualitative findings also supported that females were good at following the treatment given and maintaining consistent follow-up. This might be a persistent follow-up treatment for the females that results in a decrease in viral load and pain.

In real science, the socio-economic status of a given society is the best predictor of the social determinants of health.[34,35] The current study also found that participants who had a higher monthly income were more likely to be satisfied than those who did not have a monthly income. These findings are in line with the study done in Addis Ababa, Ethiopia and Midre-Genet Hospital in Northwest Tigray, where monthly incomes of 500–1000 Ethiopian Birr (ETB) and more than 1000 ETB were found to be 99.9% and 96.9% more likely to be satisfied than those who did not have a monthly income.[28,29]

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The present study found that those who perceived patient-provider interaction had higher odds of time-motion of patient satisfaction than those who did not interact well. This is consistent with the studies conducted in Ethiopia and abroad.[18,19,30–34] The main assumption of the Donebidean model in the process dimension also supports this idea.[23–27] A qualitative interview also added that the current innovative training on compassionate and respectful care of patients improved the service delivery process.

In previous studies, the continuity of care was determined by keeping the patient's privacy during the service delivery process.[36,37] The present study found that those who perceived privacy during interaction had higher odds of time motion of patient satisfaction than those who did perceive their privacy was not kept. This might be because, as it has been demonstrated in the qualitative interview, all the physical facilities expected the ratio of patient to provider to be more than enough.

As strength, this study is an icebreaker for public health researchers to shift research dimensions to the most important component of service delivery: the time-motion study. Another strength is study used tested model as a conceptual framework ie Donebidean model. As limitations, the study was conducted using Donebidean model to assess the three dimensions of the service provision and however, process part of the model is limited to addressing the individual perception. Another limitation is since the study was conducted using a cross-sectional design, it is difficult to determine whether the behavior or the predicting variable occurred first. This study is also subjected to social desirability bias since satisfaction is too personal, which might increase the chance for underreporting or over-reporting of the behavior.

In conclusion, 53.1% of ART patients in the research area reported being satisfied with the treatments they received, which were found to be substantially correlated with sex, income, perceived patient-provider interaction, perceived privacy, and the amount of time spent seeing medical personnel. To improve patient satisfaction, hospitals and the zone health department, as well as any organizations operating in the area of ART, should work on the service availability with time and accessibility to the nearest for the rich and poor on time. Hospitals should integrate and strengthen the system for timely service delivery. Furthermore, further study is required to analyze the strength and reach of the information through an examination of pre- and post-intervention, which offers a complete picture of conceptualizations of.

Data Sharing Statement

The data analyzed during the current study are available from the corresponding author on a reasonable request.

Author Contributions

All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that they have no conflicts of interests in this work.

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