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Assessing customer satisfaction: the case of test prescribers at the clinical biology laboratory of Centre Muraz/ Institut National de Santé Publique, Burkina Faso

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Abstract

Context Assessing customer satisfaction with a product or service is one technique for evaluating the quality of a product or service given by a company. One of the instruments used to gauge customer satisfaction is the satisfaction survey. The Clinical Biology Laboratory of Centre Muraz employed this method to determine how satisfied its test prescribers were to improve.

Method This was a cross-sectional study that took place in Bobo-Dioulasso from November 18 to December 26, 2022. Following a literature review, a questionnaire of twenty-three (23) questions was created. The questionnaire was distributed to the laboratory's prescribers, who were contacted ahead of time and consented. KoboToolbox, a data collection platform, was used. To compute frequencies, Microsoft Excel 2016 was utilized. A multivariate logistic regression model was run using R statistical software to identify the variables that best explained overall satisfaction.

Results Participants came from 19 different health care facilities. 82 prescribers completed the satisfaction survey. Overall satisfaction was 56.03%. It was 65% for nurses and 47.12% for physicians. According to the regression model, the variables "communication with the laboratory," "interpretation of test results," and "delay in reporting results" substantially explained overall satisfaction, with *p* values of 0.04562, 0.03674, and 0.00987, respectively.

Conclusion The overall satisfaction rate among the prescribers was relatively low. By acting on the significant variables, the laboratory will be able to improve this satisfaction.

Keywords Centre Muraz, Clinical biology laboratory, Prescriber, Satisfaction survey

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Introduction

Assessing client satisfaction with a product or service is one method of evaluating the quality of the offering made by a firm [1]. A perceptual indication called satisfaction gauges how well a task or action has been accomplished [2]. To evaluate this satisfaction, a variety of tools are used. The satisfaction survey is one such instrument. It is easy to identify clients who are dissatisfied with the services provided thanks to the satisfaction survey [3]. A survey is a methodical data collection process that employs a questionnaire. Typically, it is based on a sample taken from a wider population of all users or a more limited subset [4].

The concept of customer service has often been overlooked in laboratories. However, it is important to note that the laboratory is a service-oriented business. Therefore, it is crucial that laboratory customer receive what they need. The laboratory should identify who its customers are, assess their needs, and use customer feedback to initiate improvements [5]. In addition, the customer satisfaction has been designated a requirement by the international standard ISO 15189: 2012, which recognizes its significance. In fact, the standard calls for the laboratory to gather data on the user's perception to determine whether the service has satisfied the user's wants and criteria [6, 7]. A medical laboratory's customers include all its staff, patients, prescribers, health authorities, non-governmental organizations and health insurance companies [8].

The entry point to the pre-analytical process in a laboratory is the request for analysis. Therefore, a sizable share of the customers of clinical biology laboratories are prescribers. Prescriber satisfaction is a trustworthy sign of how well the clinical biology laboratory's results were produced. The laboratory can uncover the reasons for prescriber unhappiness and create and implement remedial activities to increase their satisfaction by assessing prescriber satisfaction [9]. For instance, Khalid and al's study from 2022 found that the absence of a specimen collection manual, test request form and failure to return results on time were the primary causes of physicians' dissatisfaction with laboratory services in public hospitals in Azad Jammu & Kashmir [10]. Assessing prescriber satisfaction also provides opportunities for laboratories to improve. Mc Call and Eyasu's studies found that prescribers' overall satisfaction with laboratory services was good but that there was room for improvement. For example the lack of adequacy of laboratory materials, absence of a timely report of critical values, lack of getting urgent results on time, and inadequacy of test menu on laboratory request forms were areas mentioned as sources of dissatisfaction [11, 12]. Additionally, according to Rusanganwa et al, the satisfaction survey is an effective

communication tool between laboratories and clinicians. It would increase their satisfaction and probably improve the quality of health care [13].

The Clinical Biology Laboratory of Centre Muraz (LBC-CM) launched a quality initiative in 2009 to continuously improve its services, differentiate itself from its competitors, rationalize the use of its resources, and achieve ISO 15189 accreditation and optimize the use of its resources. Bobo-Dioulasso is the economic capital of Burkina Faso, and as such, it hosts a large number of medical laboratories. Therefore, it is essential for LBC-CM to focus on customer retention, revenue stabilization, and profitability improvement. To achieve these goals, it is essential to listen carefully to the needs of its customers in order to better satisfy them and win their loyalty. In Burkina Faso, however, there is little data on prescriber satisfaction. Since LBC-CM made this commitment, no initiative has been taken to obtain feedback from prescribers and assess their satisfaction. The general objective of our study was to gather the perceptions of the laboratory's prescribers. More specifically, the aim was to determine how satisfied these prescribers were with the laboratory service in general, to identify the variables that best explain overall satisfaction and to raise staff awareness of customer expectations.

Methodology

The aim, design and setting of the study

This was a cross-sectional study carried out at the LBC-CM from 18 November to 26 December 2022, with the aim of identifying areas for laboratory improvement. The LBC-CM has seven units (hematology, biochemistry, immuno-serology, bacteriology, virology, parasitology and mycobacteriology). The Bacteriology unit has been enrolled in the mentorship program of the Step-wise Laboratory Quality Improvement for Accreditation (SLIPTA) checklist of the World Health Organization Africa Office (WHO/AFRO) since 2019 [14, 15]. Centre Muraz also houses the National Reference Laboratory for Viral Hemorrhagic Fevers (LNR/FHV). The LNR/FHV has been enrolled in the mentoring program of the West African Health Organization (WAHO) since 2019 with a view to its accreditation according to the requirements of the ISO 15189 standard.

Description of materials and characteristics of participants

The first stage of the study was to develop the questionnaire. A technical team of biologists and quality management specialists was set up. Based on the literature review, a questionnaire of twenty-three questions was developed [2, 4, 6]. The questionnaire, validated by the technical team, was divided into three sections: the "personal information" section contained two

questions, the "accessibility and communication with the laboratory" section contained sixteen questions, and the "service provision" section contained five questions. The option chosen for the questionnaire was to be able to describe the socio-demographic data of prescribers, and the characteristics and scope of services offered by the laboratory. The second step was to identify the prescribers to send the questionnaire. We used the examination request forms in the LBC-CM units to list the health centers/training and the prescribers. The third step was to organize an interview with the prescribers in these health centers/training centers. The interview was used to explain the objectives of the survey and to obtain consent to participate. All prescribers were encouraged to participate. It was up to the participant to choose the method of administering the questionnaire, either electronically or by sending a paper version to be completed and returned to the interviewers.

The data collection, management and visualization platform KoboToolbox was used [16]. It allowed the development of the questionnaire, the collection via electronic link or by manual recording, and the management and visualization of the data.

The type of statistical analysis used

To obtain a more detailed overview of the prescribers' satisfaction with LBC-CM, the different prescriber profiles (physicians, health assistants, nurses and midwives) were listed. To assess the prescribers' satisfaction with the laboratory service, we used even scales so that the participant could position himself. A yes/no scale and a dissatisfied, unsatisfied, satisfied and very satisfied scale were used to assess accessibility and communication with the laboratory and service delivery.

To take into account the weight of each observation in the dataset, weighted scores were calculated for each profile. Weighting calculates the weight and contribution of each criterion to overall satisfaction. You know what "weighs" in your customers' overall satisfaction and how much. In fact, a Gross Satisfaction Rate is the sum of Very Satisfied and Satisfied. While 60% Very Satisfied and 20% Just Satisfied customers are generally considered to be more satisfied than the reverse, where 20% are Very Satisfied and 60% Just Satisfied. The weighting factors chosen were 100 for very satisfied, 50 for satisfied, 0 for not very satisfied and -50 for not satisfied at all, as this would result in a loss of points [2]. The overall satisfaction rate was obtained by dividing the sum of the weighted scores by the number of profiles. The formula used to calculate the weighted scores was:

$$S = \frac{\sum(\text{Satisfaction rate} \times \text{Weighting factor})}{\sum \text{Weighting factor}}$$

S: Weighted score

Satisfaction rates by profile were obtained by dividing the total number of satisfied participants in the profile by the total number of participants in the profile.

Initial data analysis was performed using Microsoft Excel 2016 pivot tables. This was used to determine numbers and percentages. Statistical analysis was performed using R statistical software version 4.2.0 (2022-04-22 ucrt) [17].

Simple logistic regression was used to examine the profiles associated with overall satisfaction. To find the most explanatory model of overall satisfaction, variables with a p-value less than or equal to 20% were included in a multiple logistic regression model. The final model was obtained using a step-by step manual top-down strategy. Multiple logistic regression allowed us to determine the influence of the different participant profiles on overall satisfaction. Regression models allowed us to find the most explanatory model of overall satisfaction. A value of $p < 0.05$ was considered statistically significant.

Results

Characteristics of the originating establishments and number of participants per establishment

Participants were spread across 19 health centers/training centers.

Eighty-two (82) prescribers participated in the satisfaction survey. 41.46% of the prescribers came from the Bobo-Dioulasso University Hospital Center. Prescribers from medical centers with surgery and private clinics/offices each accounted for 19.51% (Table 1).

Professional profile of participants

Among the eighty-two (82) prescribers who took part in the satisfaction survey, physicians were most represented at 52 (63.41%), followed by nurses at 20 (24.39%),

Table 1 Characteristics of originating establishments and number of participants per establishment

Characteristics	Establishments (N=19)		Prescribers (N=82)	
	n	%	n	%
Medico-social centers	7	36.84	15	18.30
Private clinics/Offices	7	36.84	16	19.51
Medical centers with surgical unit	3	15.80	16	19.51
University hospital center	1	5.26	34	41.46
Regional hospital center	1	5.26	1	1.22

N total number, n number per profile, % percentage

health assistants at 08 (9.76%) and midwives at 02 (2.44%) (Fig. 1).

Overall satisfaction of participants

The overall weighted satisfaction of prescribers with LBC-CM services was 56.16%. Among the prescribers, 47.12% of physicians were satisfied; 65% and 50% of nurses and midwives were satisfied with the laboratory service. The profile was not statistically associated with overall satisfaction ($p > 0,05$) (Table 2).

Variables associated with prescriber satisfaction in the survey of prescribers of the Clinical Biology Laboratory of Centre Muraz

The turnaround time for results, the interpretation of the results and the communication are the variables that best explain the overall satisfaction according to the regression models carried out with variance inflation factors (VIF) less than 5 (Fig. 2). There was a statistically significant association between turnaround time and

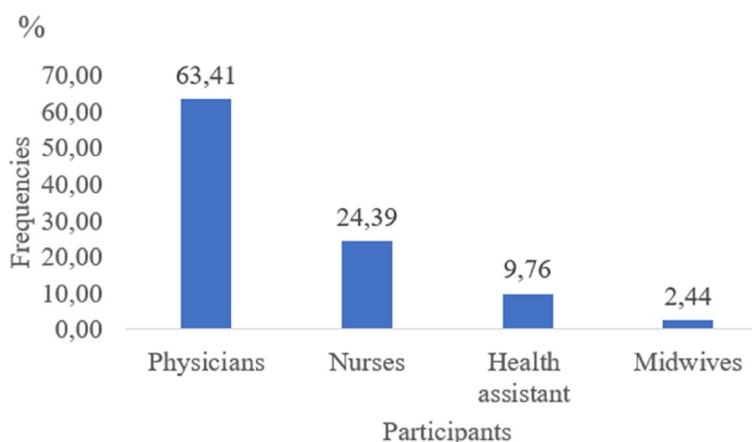
interpretation of results, communication between laboratory and prescriber and overall satisfaction ($p < 0.05$). The turnaround time for results would multiply the probability of overall satisfaction by twenty-four (24). The interpretation of the analysis results would multiply the probability of overall satisfaction by thirteen (Table 3).

Satisfaction of participants according to profile and variables that better explain overall satisfaction

The overall satisfaction rate with communication with the laboratory was 90.53%. This rate was 100% for midwives and 90% for nurses. The lowest rate was 84.62% for physicians.

With regard to turnaround time for results, the overall satisfaction rate of prescribers was 89.23%, including 100% of health assistants, 80% of nurses and 50.00% of midwives.

The overall satisfaction with the interpretation of the results of all profiles was 71.30%, including 90.00% of nurses and 82.69% of physicians.



#: percentage

Fig. 1 Professional profile of the participants

Table 2 Overall satisfaction of participants

Profile of prescribers	Numbers n (%) (N=82)					p value
	Very satisfied n(%)	Satisfied n(%)	Not satisfied n(%)	Not satisfied n(%)	Weighting scores (%)	
Physicians	7(13.46)	38(73.08)	4(7.76)	3(5.77)	47.12	0.997
Nurses	7(35)	12(60)	1(5)	0	65	0.997
Health assistant	2(25)	6(75)	0	0	62.5	1.00
Midwives	0	2(100)	0	0	50	-
Overall satisfaction rate (%)					56.16	

N total number, n number per profile, % percentage

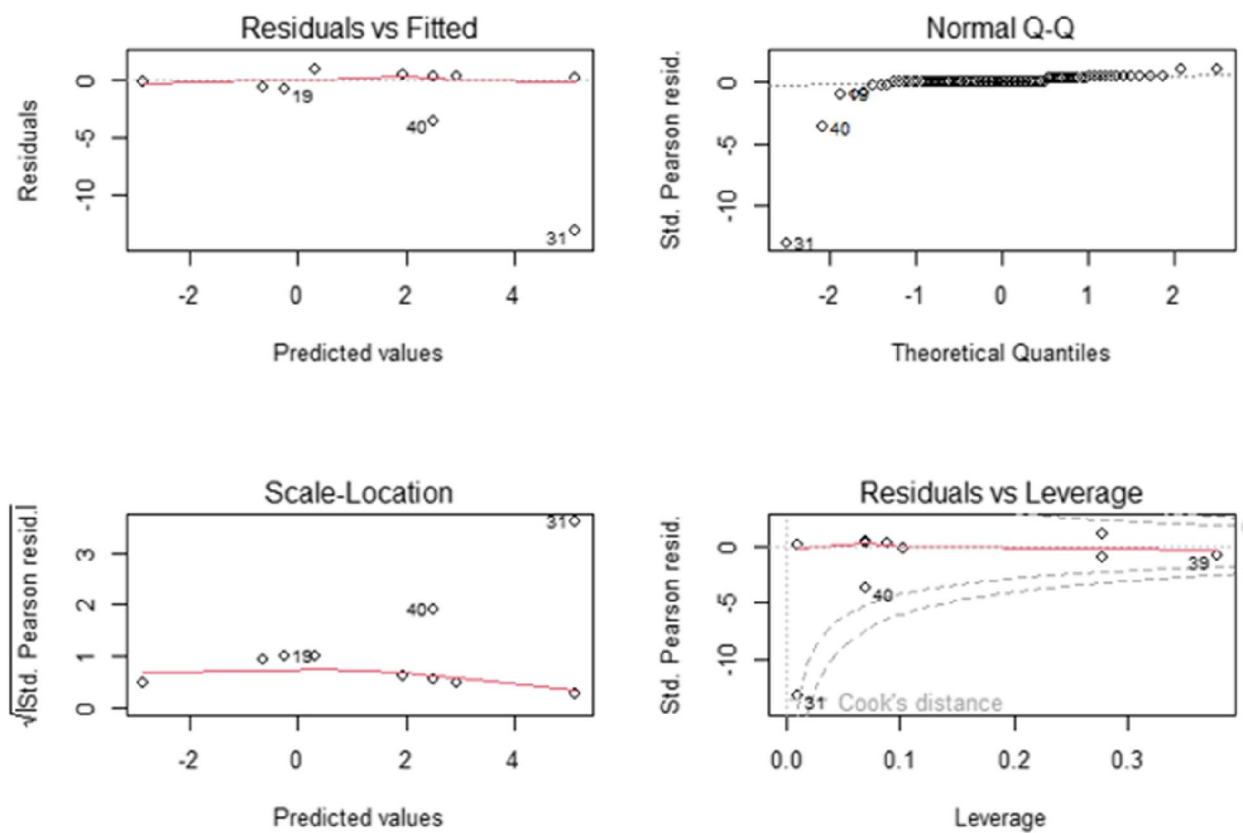


Fig. 2 Plots of the logistic regression model best explaining overall satisfaction

Table 3 Factors associated with the overall satisfaction of the participants

Statistical parameters	Turnaround time for results	Results interpretation	Communication with the laboratory
VIF	1.372096	1.372777	1.019441
p value	0.00987**	0.03674 ^a	0.04562 ^a
Odds ratio	24.19147	13.5177	8.971026

VIF Variance Inflation Factor

^a Degree of significance of the link between the two variables

**p value is less than 0.01

No profile was statistically associated with satisfaction with communication with the laboratory, interpretation of results or turnaround time for results ($p > 0.05$) (Table 4).

Discussion

Customer satisfaction surveys are an important mechanism in the quality improvement process. Our study is the first to describe this process and analyze the results from LBC-CM prescribers. The study provided an overall

view of the satisfaction of LBC-CM prescribers. Factors such as turnaround time for results, interpretation of results and communication with the laboratory were identified as influencing satisfaction. This provides LBC with avenues for action to continually improve their services. Our questionnaire did not benefit from the approach of asking prescribers about the relative importance they attach to each variable in the questionnaire as a method of external validation prior to implementation. This strategy would result in an indisputable questionnaire, but it weighs on production schedules and the study budget. By involving the medical biologists and nurses of the Centre Muraz in the design of the questionnaire, we believe we have minimized this methodological limitation and obtained results that deserve to be discussed.

The participants came from 19 health care establishments and units. This result is far from that of McCall et al, 2016 in the United States, where 81 facilities participated in the satisfaction survey (9). The fact that the LCB/CM is not a reference center in the country's health pyramid, which does not make it a preferred destination, but also the fact that the laboratory is located in the administrative district and is not open 24 hours a day, could

Table 4 Satisfaction rate of participants according to their profile and the variables that best explain overall satisfaction

Profile of prescribers	Effective (%) (N=82)		p value
	n	%	
Satisfaction of participants with communication with the laboratory			
Physicians	44	84.62	0.993
Nurses	18	90.00	0.993
Health assistants	7	87.50	0.993
Midwives	2	100	-
Rate of satisfaction with communication (%)			90.53
Satisfaction of participants with respect of turnaround time for results			
Physicians	40	76.92	0.407
Nurses	16	80.00	0.362
Health assistants	8	100	0.990
Midwives	1	50.00	-
Satisfaction rate with results delivery time (%)			89.33
Satisfaction with interpretation of results			
Physicians	43	82.69	0.284
Nurses	18	90.00	0.169
Health assistants	5	62.5	0.748
Midwives	1	50.00	-
Rate of satisfaction with the interpretation of results (%)			71.30

N total number, n number per profile, % percentage

explain this low rate. Eighty-two (82) prescribers also participated in the satisfaction survey. This result is also lower than that found by Khalid et al. in 2022 in the laboratories of the central district hospitals of Azad Jammu & Kashmir in India, where 202 prescribers responded to the survey (8). However, it was higher than that of Zaini et al. (2015) in the laboratory wards of the Maternity and Children's Hospital in Makkah and Hagos et al. (2021) in the laboratories of the National Referral Hospital in Mecca, Eritrea, whose study participants were sixty-three (63) and fifty-eight (58), respectively [18, 19].

The overall satisfaction of prescribers in our study was higher than that of Khalid et al., who found that 38% of prescribers were satisfied [10]. It was close to that of Eyasu et al. in 2015 in Ethiopia in their study conducted in the laboratory of Nekemte referral hospital, where the overall satisfaction of all health professionals with laboratory services was 62.86% [12]. On the other hand, it was lower than that of Hagos et al, where 74.1% of the participants were satisfied [19]. With a satisfaction rate of 56.16% for a first survey, the LBC-CM has a benchmark for setting its indicator for the current year. It also has data to help it develop its action plan. In order to identify potential relevant areas for improvement, we conducted analytical statistics.

The physicians in our study were 47.12% satisfied. This result was higher than that found by Rusanganwa et al.

in 2020 in clinical reference laboratories in Rwanda, where 36.2% of physicians were satisfied with laboratory services [13]. However, it was lower than that found by Eyasu et al., where 65% of physicians were satisfied [12]. Physicians represented 63.41% of the prescribers in our study, and the low rate of satisfaction observed necessarily affects the overall satisfaction of LBC-CM prescribers, although there is no statistically significant relationship between this satisfaction and the profile of the physician ($p=0.997$). Their satisfaction remains an important indicator of the quality of the services provided by LBC-CM. The organization of a framework for exchanges between laboratory managers and physicians would be a good opportunity to identify areas for improvement to increase satisfaction. In addition, 65% of the nurses in our study were satisfied. This satisfaction rate was higher than that found by Eyasu et al. Addis et al. 2013 in the clinical laboratory of Gondar University Hospital [9, 12]. In fact, the satisfaction rates of the nurses in their studies were 51.2% and 51.1%, respectively. Although higher than the rates in previous studies, our nurse's satisfaction rate was far from the 80% rate sometimes accepted as acceptable in a customer satisfaction survey [2]. As with physicians, nurses made up a large proportion of respondents (24.39%).

The basic requirement for laboratory staff is to maintain and develop the clinical communication of the medical

laboratory [20]. Communication between the laboratory and prescribers was a factor that best explained overall satisfaction in our study. In addition, 90.53% of prescribers were satisfied with this communication. This high rate, compared to that obtained by Almatrafi et al. in the clinical laboratory services of King Abdullah in Mecca, would be due to the availability of all staff, the ease of contact with the heads of units and the provision of a telephone number to contact the prescriber and the laboratory directly [21]. However, it would be interesting for LBC to also organize regular meetings, telephone exchanges and interpretative comments on test reports to further strengthen communication with prescribers.

Physicians are regularly confronted with the uncertainty and difficulties associated with ordering and interpreting diagnostic tests. In addition, the number and complexity of clinical laboratory tests are increasing rapidly, making it difficult for prescribers to interpret them accurately, efficiently and safely [22]. Our study showed that the interpretation of the results multiplied the overall satisfaction of the prescribers by more than thirteen (13) and that only 71.30% of the prescribers were satisfied with this variable. These results could be explained by the lack of information about requests for analysis. The LBC-CM should also make an effort to improve practices, in particular by contacting clinicians when additional information is needed, organize educational sessions on the topic, highlight her toll-free number on the results report and professional e-mails to its physicians and pharmacy biologists. The lowest rate (50%) was also observed among midwives. The small number of participants (2) in this profile could justify this rate.

The turnaround time for results is a quality indicator to assess the effectiveness and efficiency of the testing process and prescriber and patient satisfaction. Timely notification of critical results was one of the pain points identified by Hailu et al, 2020 in the clinical laboratory departments of public hospitals in Ethiopia [23]. Ensuring that laboratory results are available in a timely manner based on the urgency of clinical decision-making is another example of how laboratories can affect clinical decision-making timelines [20]. However, despite advances in technology, transport and staff training, delays in reporting results remain a source of dissatisfaction for patients and prescribers. In fact, the concept of quality in laboratories has generally been limited to technical or analytical quality, focusing on reliability and accuracy objectives. Prescribers, on the other hand, want a fast, reliable and cost-effective solution. Punctuality is probably most important to the prescriber, as the analytical quality of the results is not very perceptible to them. Much of the current growth in rapid diagnostic testing is driven

by this shortcoming [24, 25]. The turnaround time for results is therefore a cornerstone for measuring laboratory efficiency. It multiplied overall satisfaction by twenty-four (24) times in our study. Although in our study the rate of prescriber satisfaction (89.23%) with the turnaround time for results is much higher than that observed by Almatrafi et al, which was 16.70% [21], we need to take a practical approach to optimizing it. There is variability in the turnaround time for results depending on different conditions, such as sample volume and size, staff expertise, availability of adequate resources, distance between hospital and laboratory and different subdepartments [24]. We must work to remove the barriers by making this delay as short as possible for the benefit of patients. For example, the implementation of a laboratory information system (LIS) can optimize this process. It is this option that the LBC-CM would have chosen with the operationalization of the LabBook platform from 2022 [26].

Conclusion

The survey revealed a relatively low level of prescriber satisfaction with the Centre Muraz Clinical Biology Laboratory. The survey showed that factors such as communication with the laboratory, turnaround time, and interpretation of results were the variables associated with satisfaction among LBC prescribers. The data obtained will allow the laboratory to redefine its policies, objectives and quality plan to ensure continuous improvement and even accreditation of its activities.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-12260-4>.

Supplementary Material 1.

Supplementary Material 2.

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Authors' contributions

-D. Y, Is. S, C. T, D.B. S, A. S, S.D. S; M. C, A.M. K, R.T.A. O, D. K, M.K. G, Ib. S, A.S. O. participated in the design, data collection and assembly, analysis and interpretation. -Ib. S. and A.S. O provided administrative support and materials for the study. -All authors reviewed the manuscript.

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Data availability

The authors confirm that the data supporting the findings of this study are available within the supplementary materials via this link: https://docs.google.com/spreadsheets/d/1zApt_XZ-11IXzvXyVo0Gsoq9N-GXqTE/edit?usp=sharing&oid=112967195307525624143&rtfpof=true&sd=true.

Declarations

Ethics approval and consent to participate

All the methods and procedures carried out in this study were in accordance with the Declaration of Helsinki and adhered to Burkina Faso National Health Research and Ethics Guideline. All participants were provided with detailed information about the study, including the purpose of assessing customer satisfaction, the methods of conducting in-person or online interviews, and ethical considerations such as the voluntary nature of disclosure and protection of privacy. They provided written informed consent. Ethical approval was obtained from Centre Muraz Institutional Review Board.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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