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Antecedents of Patient Satisfaction in Private Clinical Laboratories toward Patient Loyalty with Switching Cost and Location as Moderating Factors (An Empirical Study from Indonesia)

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Abstract

BACKGROUND: Clinical laboratory (CL) services are at the forefront to support health-care services, particularly during the pandemic of COVID-19. The increasing number of private clinical laboratories at present days indicates the increase in patient needs, causing the health-care service provider to face challenges as people have more options. Therefore, fostering patient loyalty (PL) is a crucial success factor for the business growth of clinical laboratories as health-care providers.

AIM: The purpose of this study is to analyze antecedents of patient satisfaction (PS) in clinical laboratories towards PL with the switching cost and location as moderating factors.

METHODS: This study was done as a quantitative survey, and data were obtained by a cross-sectional approach with partial least squares structural equation modeling for the data analysis method. There are 266 respondents eligible as samples, who undergo the phlebotomy process (PP) in a private laboratory located within a specific area.

RESULTS: This study demonstrated that all the nine hypotheses supported with α: 0.05 and p < 0.05, include six independent variables named administrative process, information availability (IA), the environment in the phlebotomy room, PP, waiting time, and result notification that influence PS. PS has been shown to have a direct effect on PL and also mediate the antecedents. Furthermore, SC and LO have demonstrated a significant effect to moderate this relationship.

CONCLUSIONS: PS has been confirmed as the main construct to predict PL whereas the AP is the most important independent variable followed by IA. CL management should pay more attention to these antecedents to ensure PS and retain the clinic's patients. The cost from the patient's perspective should be taken into account since this helps the CL keep the patient loyal.

Introduction

The role and availability of health-care facilities have a significant impact on the health status of society and a country's sustainable development [1]. As a result of demographic growth, health-care systems are faced with limited resources and rising demand. The difficulties in this complex system must be balanced to maintain a sustainable quality of life, and the contribution of supporting healthcare facilities is significant [2]. One of the essential supporting facilities in the implementation of health services to assist in establishing medical diagnoses, monitoring disease, and determining treatment according to the patient's condition is clinical laboratory (CL) services [3]. Up until recently, the importance of CL as a vital element of the healthcare system was unacknowledged, but as health research and technology have advanced, more physicians have realized the need for laboratory tests to confirm diagnoses and monitor patients' responses to therapy. On a broader scale, laboratory services fulfill a substantial role to maintain public health and preventing outbreaks of infectious diseases from a national level to international. According to ownership, CL can be public, as they are frequently discovered in hospitals or medical centers owned by the government or private sector as part of a privately owned healthcare institution [3]. Private health facilities are found to be superior to public health facilities in terms of services since they provide service excellence as a strategy for the competition [4].

The venous blood examination (phlebotomy) is the most common clinical procedure conducted in the CL, and it determines the majority of medical judgments regarding the patient's condition. The success of the phlebotomy process (PP) is influenced by the skills of medical personnel and the patient's physiological condition [5]. Therefore, the skills of medical personnel in performing the PP can be one of the determinants of patient convenience and satisfaction [6], [7]. By building and operating a health laboratory that has complete facilities and competent medical personnel, it is expected to improve the health status of the community so that there can be a reduction in mortality and morbidity rates [8].

The coronavirus disease found in 2019 (COVID-19) is highly infectious disease and spreads rapidly in the human population, in that regard, prompt and precise diagnostic procedures are needed to prevent transmission [9]. Until now, the clinical diagnosis of COVID-19 was based on the reverse transcription-polymerase chain reaction test result, but this test can also produce false-negative results, takes a long time, and the availability of tools is evenly distributed. Another simpler alternative and more rapid method to assist in the diagnosis of COVID-19 is serological testing of IgM and IgG obtained from the blood collection [10]. In addition to establishing a diagnosis, blood tests also play a role in disease monitoring and evaluation of treatment for COVID-19 patients [8], especially for patients with comorbidity. However, studies in the health service, particularly by CL in the pandemic era are still considered rare.

The COVID-19 pandemic has affected all fields, significantly in the health-care sector. One of the countries that are suffering from the pandemic is Indonesia. It has a higher COVID-19 case fatality rate (2.7%) than the rest of the world (2.3%) in February 2021 [11] and this rises to 3.3% in February 2022 [12]. Indonesia is an emerging country that ranks 4th largest population in the world (262 million people); however, the geographical and socioeconomic diversity in Indonesia causes challenges in the health aspect [13]. In this regard, health-care studies in Indonesia can be used to add to the literature on how to enhance the health-care system. During the COVID-19 pandemic, patient visits to hospitals decreased [14], but based on a comparison of the data in the Indonesian Health Profile in 2020 and 2019, it is known that there was an increase of 18.7% in the number of clinical laboratories. The largest ownership contribution comes from the private sector, which is 83.1% of the total number of clinical laboratories in Indonesia [15], [16]. Considering its distribution, the growing number of clinical laboratories in Indonesia is still centered on the island of Java, especially in the areas of Jakarta and the surrounding area which reach 36.5% of the total laboratories in Indonesia [16].

The increasing number of clinical laboratories these days shows that the healthcare business environment is getting more competitive as patients gain more options to switch to any other healthcare provider [17], [18]. Therefore, to stay competitive in the market, each laboratory must be able to present their business excellence, because although many patients visit a CL by doctor's reference, they still have choices to select the CL based on their prior experience; hence, it is critical to evaluate factors that have influenced patient satisfaction (PS) to maintain their loyalty [19], [20]. Patient loyalty (PL) is defined as a commitment to consistently reuse a particular service in the future [21], [22], [23]. This will be a challenge for laboratory management, so an effective management approach is needed to run a laboratory

business in private clinics [24]. One form of innovation that is growing rapidly is digital transformation in the delivery of examination results whose role in PS will be explored more thoroughly in research as a result notification (RN) [25], [26], [27].

A theory from Donabedian (1988) explains PS represents the outcome of an interpersonal health care process [2], [28]. According to some of the previous research, the perception of PS toward a health service is known to affect PL, therefore evaluating the factors that affect PS is significantly important to be able to increase PL [17], [19], [20], [29], [30]. To be able to explain the antecedents of PS and its impact on loyalty, this study develops the theory of Mehrabian and Russell (1974) about stimulus organism response. In the context of healthcare, service stimuli can be in the form of care from doctors, nurses, as well as all processes during which services are provided, and the physical environment that will influence patient behavior in the future [21], [31].

The centers for disease control (CDC) and prevention (CDC) mentioned that laboratories are health service facilities that are at the forefront to protect public health [32], but research related to PS and loyalty to laboratory services is still very limited. Therefore, the study primarily focuses on CL is required. This study contributes to health management by proposing a new research model (Figure 1) which is modified from previous research. This model particularly focuses on the relationship between PS toward PL [17], [19], [20], [29] focusing on the search for factors that influence PS in CL services. Factors that can affect PS include; administrative process (AP), information availability (IA), waiting time (WT), and the technical service provided by a health professional (nurse) named PP, the environment in the phlebotomy room (ER), and results in the notification (RN). The last three factors are unique in the service provided by clinical laboratories [6], [7], [26], [27], [33], [34]. These factors are then used as independent variables in this proposed research model as described in Figure 1. The dependent variable in this research model is PL, while PS is a mediating variable which is also the target construct. However, because these more prior studies were unconducted during a COVID-19 pandemic, it is unknown whether these characteristics were altered during a pandemic. As the challenges encountered by the clinical laboratories constantly arise, other external factors outside of PS can affect the PL [3]. Rationally, consumers will not switch to a company that offers a lower price if the switching cost (SC) to switch to that company is greater than the costs they must incur if they do not switch. If the company succeeds in making consumers loyal in this way, it can increase prices to a certain point without fear of losing those customers [35], [36]. Based on the previous research, SC has a significant effect on PL [37], [38]. In addition to SC, ease of access to clinic locations (LO) has a

significant effect on PS, the closer or easier access to health services LO is, the more PS will increase so it has an impact on increasing loyalty [33], [39], [40]. However, there is a paucity of research on SC and LO, particularly as mediating variables between PS and PL, thus this study attempt to explore more about the role of SC and LO as a moderator in PS toward PL.
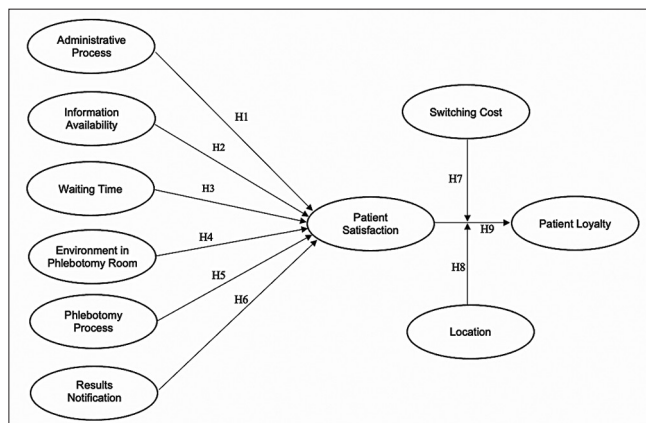

Figure 1: Conceptual framework

This study aims to contribute to health-care literature, particularly for health-care providers who came in contact directly with patients in CL service by analyzing antecedents of PS towards PL with SC and LO as moderating factors. In terms of the institution, it is critical to identify the elements that produce the most remarkable impact on PL including financial ones such as increased profitability and growth [17], [41].

Methods

Based on the type of research strategy, this research uses a quantitative study with a survey. No intervention was carried out on the subject during the study period (non-interventional study). From the aspect of data collection time, this research uses a cross-sectional studies approach [42]. Data were obtained by purposive sampling technique with inclusion criteria: An individual that has experienced the PP (commonly called patients) was the unit analysis in this study. Empirically, the conceptual framework will be tested on a population that is targeting outpatient patients that have experienced the PP in private laboratories located within Jakarta as a capital city and the surrounding area from February 2021 to March 2022. Ethical approval for this study was obtained from Pelita Harapan University (005/MARS-FEB-UPH/1/2022). The questionnaire as an instrument was distributed from February to March 2022, resulting in 279 respondents. After elimination and excluding invalid answers, 266 samples were eligible and sufficient for a minimum requirement from partial least squares structural equation modeling (PLS-SEM) analysis guidance [43], [44]. The questionnaire is adapted from a

couple of previous studies [6], [7], [17], [23], [27], [34], [38], [39], [40], [45], [46], [47] and then modified to novelty concepts. Before distribution, the completed questionnaire was then translated to the standard Local language (Bahasa) and reviewed by a translator. Respondents who have agreed to participate in the study signed an online informed consent and were required to answer the question on a Likert Scale of 1–5 score. [42].

This study uses a data analysis method with a multivariate analysis approach due to the complexity [42]. In this conceptual framework, there are six independent variables (AP, IA, WT, ER, PP, and RN) as the antecedent of PS was tested to observe the impact on the dependent variable (PL) that was moderated by 2 moderating variables (SC and LO). This conceptual framework (Figure 1) makes up nine hypothetical paths marked with arrows this study uses the method of analysis with PLS-SEM as the orientation of this research is an exploratory and predictive approach [48].

The PLS-SEM analysis was conducted with the SmartPLS™ software version 3.3.3 in two stages, measurement model (outer model) and structural model (inner model) evaluation. The outer model measured the reliability and validity of all indicators and also measured the respective constructs. The inner model will then prove the significance of each hypothesis [44], [48], [49], [50]. Furthermore, the IPMA menu is recommended used to obtain more particular management implications [51].

Results

The 266 valid responses from patients that have experienced the PP within the previous year in the selected CL are described in Table 1. Female (54.5%) aged 31 to 40 years old (46.6%) and living in Jakarta and the surrounding area. Most of them visit the CL 1–2 times/year (58.3%) by referral from a private practice doctor (38%) or referral from a private clinic (33.5%) and have already known the clinic for over 5 years (50.8%). Due to the COVID-19 pandemic, there was a question related to whether or not the patient came to the CL for doing the COVID-19 related examination and the result shows that 58.6% came for the COVID-19 examination.

Private practice doctor: A physician that practices without being controlled or paid for by the government or a larger company (such as a hospital).

The analysis process starts with an evaluation of the reflective indicator reliability with outer loading value calculation. Table 2 shows that a total of 33 indicators met the outer loading criteria (>0.708), indicating that all of the indicators in this study are reliable [48], [49]. The

Table 1: Respondents characteristic

Demographic variables	Sample (n)	Percentage
Gender		
Male	120	45.1
Female	145	54.5
Choose to not answer	1	0.4
Age		
<20 years	12	4.5
21–30 years	39	14.7
31–40 years	124	46.6
41–50 years	63	23.7
>50 years	28	10.5
Frequency of visits		
1–2 times/year	155	58.3
3–4 times/year	87	32.7
>5 times/year	24	9
Duration of knowing the clinic		
<1 year	20	7.5
1–3 years	50	18.8
3–5 years	61	22.9
>5 years	135	50.8
Reasons to choose the health-care facilities		
Referral from a private practice doctor	101	38
Referral from a private clinic	89	33.5
Referral from hospital	26	9.8
Referral from public health center [Puskesmas]	6	2.3
Others	44	16.5
Reason for blood test related to COVID-19		
Yes	156	58.6
No	107	40.2
Not willing to mention	3	1.1

second step is evaluating construct reliability to test internal consistency in the model and avoid indicator redundancy. All of the variables' values are reliable, with Cronbach's Alpha more than 0.7 and Composite Reliability <0.95 as the lowest and upper boundaries, respectively [48], [49]. Convergent validity is determined by evaluating the average variance extracted (AVE). All indicators are valid if the AVE score is more than 0, 50, indicating the constructs can explain at least 50% of the variance, hence can be acceptable [48], [49].

The final evaluation in the outer model is done with the discriminant validity test by calculating the Heterotrait-Monotrait (HT/MT) ratio. Recommended value for HT/MT ratio is <0.9 to differentiate the indicator's concept [48], [49], [52]. The results are presented in Table 3, where all indicators are specified to measure their respective constructs. This outer model evaluation confirm that all indicators in this proposed research model are reliable and valid based on the outer model's evaluation results, thus the structural model can proceed.

The inner model analysis is the second part analysis conducted to evaluate the quality of the model in this research by predicting the relation between variables. Parameters in the inner model consist of variance inflation factor (VIF), R-square (R^2), and Q-square (Q^2) predict. Inner VIF was conducted to evaluate and test the multicollinearity between all variables. This test showed all VIF values below 5 which suggested and thus no collinearity issue was found [48], [49]. R^2 value results of both PS (0.665) and PL (0.664) have moderate to strong explanatory power due to values >0.5 [48], [49]. PLS predict procedure was utilized to assess the predictive power of the proposed model by getting the model's out-of-sample predictive value. All Q^2 construct predict values were found relevant, both PL (0.620) and PS (0.629) demonstrate large predictive relevance (>0.50) which can be interpreted that this research model has adequate ability to predict PL in the different sample [49], [50].

The bootstrapping procedure was conducted to determine the significance of variables and to confirm all hypotheses proposed in this model. The $p < 0.05$

Table 2: Reliability and validity analysis

Variables	Indicators	Outer Loading	CA	CR	AVE
AP	I feel the service of the admin staff in this laboratory is fast	0.828	0.802	0.870	0.627
	I feel the admin staff at this laboratory are friendly and polite	0.804			
	I feel that the information from admin staff in this laboratory is clear	0.824			
	I feel that the admin staff in this laboratory is paying attention to my needs	0.706			
IA	I feel the reservation system in this Laboratory is good	0.762	0.804	0.885	0.721
	I find it easy to find information related to this Laboratory	0.924			
	I find it easy to find information related to the examination I need in this laboratory	0.853			
WT	Waiting to complete PP is still within my tolerance limit	0.848	0.782	0.873	0.697
	I don't mind waiting for the PP in this laboratory if there is a problem in the queue	0.857			
	I don't mind waiting as long as it's worth the quality	0.799			
Environment in Phlebotomy Room	The access to phlebotomy room in this laboratory is easy	0.776	0.765	0.850	0.586
	Chairs for the PP in the laboratory are comfortable	0.760			
	The cleanness of the phlebotomy room is well maintained	0.721			
	The equipment for the PP is sterile	0.803			
PP	Phlebotomist in this laboratory is sufficient	0.786	0.874	0.915	0.729
	Phlebotomist explained the PP	0.812			
	Phlebotomists are professional	0.904			
	Phlebotomists require only one attempt to complete the process	0.907			
RN	The results of blood tests are on time	0.891	0.837	0.902	0.754
	The blood test results are easily accessed online	0.846			
	The blood test results are as requested	0.867			
PS	I am satisfied with the overall services provided in this laboratory	0.827	0.782	0.873	0.696
	The service in this laboratory has met my expectations	0.839			
	I am impressed with the services provided in this laboratory	0.836			
LO	This laboratory is easy to reach	0.790	0.860	0.916	0.785
	I had no transportation problem to this Laboratory	0.916			
	This laboratory is in a strategic LO	0.944			
SC	Switching to another laboratory will increase the cost	0.971	0.957	0.972	0.920
	I won't necessarily get a cheaper price if I move to another Laboratory	0.955			
	I will waste time and energy if I switch to another Laboratory	0.952			
PL	I will choose this laboratory if I need laboratory tests	0.706	0.738	0.814	0.595
	I will still choose to do tests in this laboratory even though there are offers from other laboratories	0.847			
	I will recommend this Laboratory to my friends or family	0.754			

CA: Cronbach's alpha, CR: Composite reliability, AVE: Average variance extracted.

Table 3: Discriminant validity with HT/MT ratio

Variables	AP	ER	IA	ModLoc	LO	PS	PL	PP	RN	ModSC	SC
ER	0.858										
IA	0.792	0.786									
ModLoc	0.110	0.071	0.084								
LO	0.217	0.192	0.173	0.217							
PS	0.877	0.886	0.838	0.021	0.173						
PL	0.460	0.509	0.452	0.035	0.314	0.549					
PP	0.713	0.827	0.799	0.054	0.212	0.830	0.404				
RN	0.642	0.708	0.639	0.061	0.083	0.762	0.312	0.801			
ModSC	0.089	0.044	0.049	0.386	0.144	0.067	0.055	0.065	0.037		
SC	0.405	0.474	0.556	0.139	0.220	0.485	0.725	0.396	0.290	0.164	
WT	0.762	0.861	0.745	0.083	0.137	0.852	0.393	0.852	0.809	0.069	0.331

AP: Administrative process, ER: Environment room, IA: Information availability, ModLoc: Moderating effect of LO between PS and PL, LO: Location, PS: Patient satisfaction, PL: Patient loyalty, PP: Phlebotomy process, RN: Results notification, ModSC: Moderating effect of SC between PS and PL, SC: Switching cost, WT: Waiting time.

and T-statistic >1.645 (one-tailed with α 0.05) with confidence interval is cutoff criteria for determining the significance of the hypothesis [44].

All nine hypotheses are supported by a T-statistic >1.645, p < 0.05, and a range of CI of 5% and a CI of 95% in positive value (Table 4). The standardized coefficient was found to be positive in line with the direction of the hypotheses. The standardized coefficient value of the AP to PS was found greater than others (0.276), indicating that AP in laboratory services is the strongest predictor of PS. The role of SC as moderating variable could be seen in H7. T-statistic was found >1.645 with a coefficient of 0.147 hence, it shows SC has a significant and positive moderating effect. The slope analysis (+1SD) indicates that the higher perception of SC, the stronger influence of PS on PL (Figure 2).
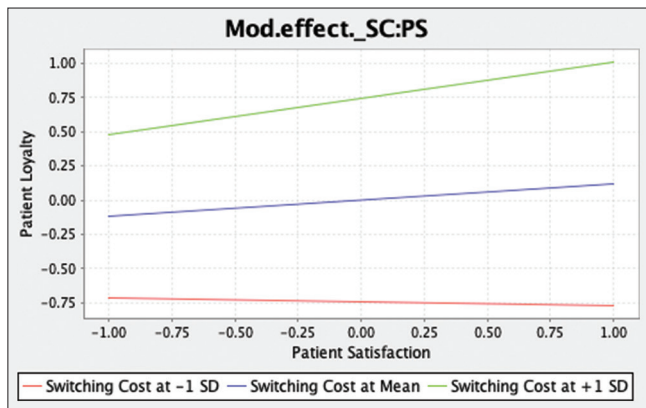

Figure 2: Simple slope analysis of switching cost

The role of LO as moderating variable could be seen in H8. T-statistic was also found >1.645 with a coefficient of 0.073; hence, it shows that LO has a significant and positive moderating effect. The slope analysis (+1SD) show that the higher perception of

LO (accessibility), the stronger influence on PS to PL (Figure 3).

Importance-performance map analysis (IPMA) was used to help laboratory management identify which areas need to prioritize for improvement. IPMA is an effective tool that resulted from the combined effect and performance based on the mean value. Figure 4 can be divided into four quadrants to identify the respective indicators that need to be maintained or improved [51].

The AP variable is shown in quadrant IV (lower right side) of Figure 4 above, meaning this variable needs to be prioritized by CL management because it is considered important for patients but has not shown adequate performance. Figure 5 describes the empirical model from the data analysis using Smart PLS™.
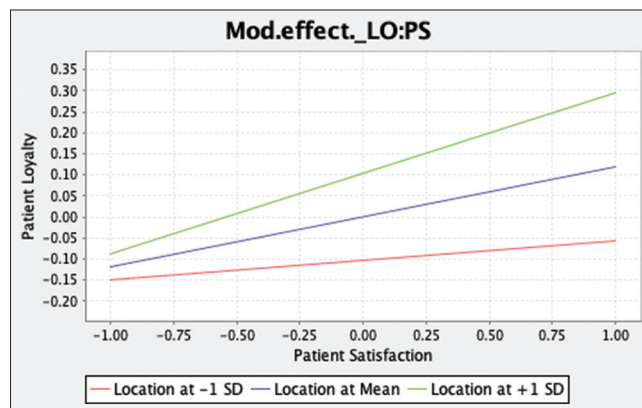

Figure 3: Simple slope analysis of location

The result of the PLS-SEM analysis with the coefficient value is depicted in Figure 5 above to describe the empirical model. Due to this result, the proposed model has adequate capability to predict PL in the context of CL services.

Table 4: Significant and coefficient

Hypothesis	Standardized coefficient	T-statistics	CI 5%	CI 95%	p-value	Results
H1: Administrative Process → Patient Satisfaction	0.276	2.411	0.109	0.475	0.008	Hypothesis supported
H2: Information Availability → Patient Satisfaction	0.179	2.353	0.055	0.311	0.009	Hypothesis supported
H3: Waiting Time → Patient Satisfaction	0.125	2.217	0.029	0.218	0.013	Hypothesis supported
H4: Environment Room → Patient Satisfaction	0.148	1.889	0.025	0.284	0.029	Hypothesis supported
H5: Phlebotomy Process → Patient Satisfaction	0.132	2.300	0.036	0.223	0.011	Hypothesis supported
H6: Results Notification → Patient Satisfaction	0.121	2.578	0.038	0.191	0.005	Hypothesis supported
H7: ModSC: Patient Satisfaction → Patient loyalty	0.147	1.981	0.656	0.817	0.024	Hypothesis supported
H8: ModLoc: Patient Satisfaction → Patient loyalty	0.073	1.723	0.012	0.152	0.042	Hypothesis supported
H9: Patient Satisfaction → Patient loyalty	0.119	1.856	0.023	0.232	0.032	Hypothesis supported

CI 5%: Confidence interval of 5%, CI 95%: Confidence interval of 95%, ModSC: Moderating effect of Switching cost between patient satisfaction and patient loyalty, ModLoc: Moderating effect of Location between patient satisfaction and patient loyalty.
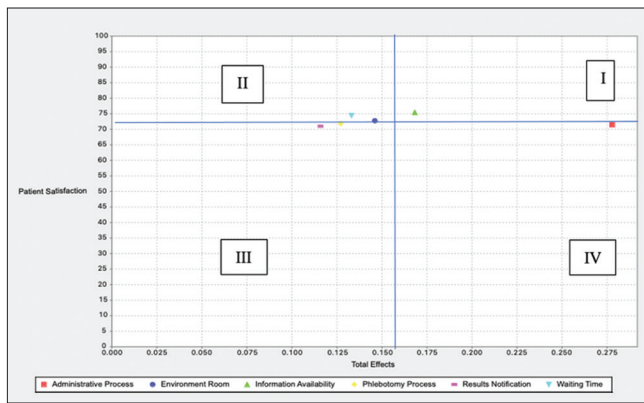
Figure 4: Importance-performance map

Discussion

This study's outcomes are mainly consistent with prior empirical studies [17], [19], [20], [29] and therefore confirm that PS significantly impacted PL in the context of CL. This empirical study presented the most recent condition during the COVID-19 pandemic exclusively in the private CL, whereas other previous studies' samples were taken from hospitals or other various industries hence giving the new novelty from the sample's characteristics. The qualified majority of patients (58.6%) came for blood tests related to COVID-19 parameters evaluation, which could affect the patient's perception of PS and have an impact on their loyalty.

Align with the previous studies [6], [7], [26], [27], [33], [34], findings from this study revealed the number of PS antecedents. This study contributes to the health management literature by analyzing both aspects of health services, namely, functional (AP, IA, WT, ER, and RN) and technical (PP) aspects as appear in the PP [53]. AP, IA, WT, ER, PP, and RN have proven to be significant factors that can impact PS, therefore, can be applied in the preparation of CL's business and marketing strategies. The standardized coefficient value of AP to PS in this study was found greater than other independent variables (0,276). This is may occur

Figure 5: Empirical model

since patients have no adequate medical background to assess the medical procedure like phlebotomy, therefore they tend to respond more to how the administrative service is delivered. The AP is the first stage of direct contact with patients. It precedes other processes, and a good first impression of AP could increase PS, even though this type of stage is not provided by healthcare professionals. Allocation of time and resources to facilitate the training opportunity for administration staff should be prioritized by the management because the AP is seen as the most crucial aspect for patients but has not shown adequate performance (Figure 4), hence prioritizing administration services could help to achieve higher PS performance level and increasing PL [7], [45].

Switching cost (SC) And LO were added as moderators to predict PL which was undiscovered in prior studies [17], [19], [20], [29]. The PLS-SEM analysis in this empirical study revealed that SC and LO as quasi moderators had a significant and positive impact on the direct relationship between PS and PL [54], [55]. The greater LO accessibility, the more likely a patient to remain loyal. Likewise, the higher SC perceived by a patient the stronger likelihood of a patient to be more loyal to the CL. SC fondly refers to all factors that make switching to a different service provider more difficult for a consumer, including costs in a financial context (tariff), time, effort, and psychological difficulties [35], [36], [37], [38]. The standardized coefficient value of SC as moderating variable (0.147) in this study was found greater than a standardized coefficient value between PS to PL (0.119), in that sense, SC could be considered as a direct predictor of PL in further studies instead as a moderator.

From the R^2 and Q^2 predictive value, this proposed research model demonstrates a large predictive value, hence, can be suggested for future research on PL of CL services in different countries with various backgrounds.

Conclusions

This research proposed a new model and the findings revealed that PS had a direct impact on PL in the CL setting, while SC and LO have been found as meaningful moderating factors in this relationship. Therefore, to improve PL, CL management has to pay more attention and monitor PS continuously. Moreover, AP and IA should be taken into account to provide better services. This insight could be useful for improving further management's strategy to help retain patients and also attract new patients.

The number and type of respondents are limitations of this study. A recommendation for further research is to obtain more respondents from various
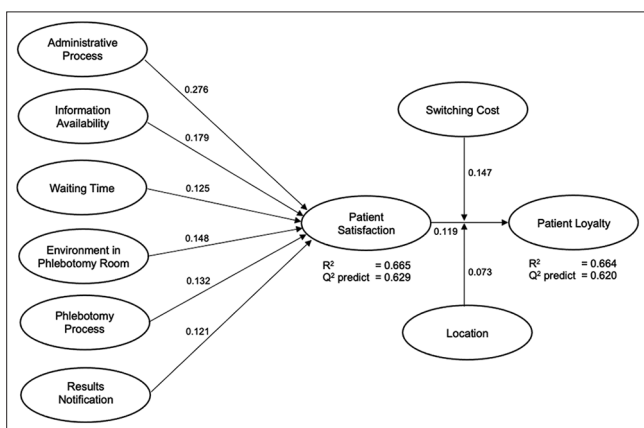
demography and by collecting data through direct interviews with patients shortly after they finished the test procedure at the clinic. It is also required in future research to separate the respondent in COVID-19 related patients and analyze psychological factors that may affect PS.

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Author Contribution

The final text was approved by all writers who contributed equally to the study.

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