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Research Paper

Satisfaction among patients and caregivers receiving value-added services during the COVID-19 pandemic outbreak in a tertiary hospital in the Perak state of Malaysia

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Abstract

Objectives Patient satisfaction was used as an indicator of service quality in the public hospitals. The pharmacy value-added services (VAS) were intensified after the COVID-19 outbreak, and evaluation of user's satisfaction was important for service improvement.

Methods This was a single-centre, cross-sectional, web-based study in the outpatient pharmacy in a tertiary hospital in the Perak state of Malaysia. Patients and caregivers aged 18 years and above, received at least one prescription refill using the pharmacy VAS from April to September 2020, were included. The questionnaire was adapted from a validated tool, underwent face and content validation before dissemination. The link was disseminated to the targeted population through short messages service (SMS).

Key findings Out of 1200 invited people, 303 agreed to participate. Majority of the respondents were male (160, 52.8%), Chinese (156, 51.5%), with tertiary education (201, 66.3%) and retiree (112, 37.0%). Out of a maximum score of 5, the overall mean satisfaction score was 4.42 (SD: 0.55). The respondents were most agreeable to time-saving benefits of the pharmacy VAS (4.56 ± 0.63). Majority of the respondents felt that pharmacy VAS had made their life easier (290, 95.7%) and planned to recommend the pharmacy VAS to others (292, 96.4%) Respondents aged more than 60 (versus age 18–35, β = 2.375, P < 0.001) and those who used drive-through service (versus SPUB, β = 2.272, P = 0.001) reported higher satisfaction scores. Several suggestions were made for service improvement, including longer operating hours (18, 6.0%), upgraded communication system (9, 3.0%), smoother registration process (9, 3.0%), more polite staff (9, 3.0%), selection of preferred postage delivery time (6, 2.0%) and promotion of VAS (4, 1.3%)

Conclusions Majority of the respondents were highly satisfied towards the pharmacy VAS. Future studies should compare the satisfaction of VAS with traditional counter service to compare the level and factors that contributed to the users' satisfaction.

Keywords: satisfaction; patient; pharmacy; value-added service; pharmacist; Malaysia

Introduction

Patient satisfaction is defined as patients' evaluation of the care provided relative to their expectations.[1] A better patient satisfaction is associated with higher medication adherence,[2] reduced medicolegal suits,[3] and increase professionals job satisfaction.[4] In Malaysia, patient satisfaction was used as an indicator of service quality in the public hospitals.[5, 6]

In the conventional dispensing system, patients are required to refill the medications using over-the-counter mechanism, which entails a long waiting time and thus affecting patient satisfaction.[7, 8] Hence, the pharmacy value-added services (VAS) were initiated to ease medication refills. In Australia, medication home delivery services and drive-through services were preferred over the conventional dispensing method.[9] Additionally, patients who used drive-through pharmacy services reported better overall prescription refilling rate.[10] In the USA, patients who used mail order pharmacy had higher medication possession ratios, lower diabetes-related medical costs over time[11] and better satisfaction.[12]

In Malaysia, the pharmacy VAS was introduced in the Ministry of Health to facilitate refill of medications, reduce waiting time and improve patient satisfaction.[13, 14] The most common pharmacy VAS includes Integrated Drug Dispensing System, drive-through pharmacy, Prescribed Medication Courier Service and Appointment Card System. After clinic visits, patients obtain the first 30-day medication supply from the hospital pharmacy counters. They can choose to use the conventional counter service or one of the VAS (mail, drive-through, appointment card, Integrated Drug Dispensing System) for their subsequent refills.

The Integrated Drug Dispensing System enables patients to refill their medications from any government health facilities that are listed under the Ministry of Health Malaysia.[15] The drive-through pharmacy allows patients to collect their partial supplies through a designated drive-through pharmacy counter within the hospital compound,[16] while the Prescribed Medication Courier Service couriers refill medication to the patient's location of choice.[17] In the Appointment Card System, medications are prepacked and patients can collect their medications according to the dates specified on their appointment cards without queuing.

As of June 2021, more than 3 million mortality cases due to the Coronavirus disease (COVID-19) have been reported worldwide since the announcement of COVID-19 as pandemic in March 2020.[18] The Ministry of Health, Malaysia implemented various strategies to curtail the infection, including physical distancing.[19] One of the measures was to increase the use of pharmacy VAS, the aim of which was to reduce congestion in hospitals. This led to a marked increase in the utilization of this service, in which 4 out of 5 patients refilled their medication using the pharmacy VAS in 2020, in comparison to 2 out of 5 in the year 2019.[20] As the use of pharmacy VAS had substantially increased after the COVID-19 outbreak, it is imperative to study the satisfaction of the users. This study aimed to assess the patients and caregivers' satisfaction towards the four primary VAS in the hospital and to explore their expectations for value-added service improvement.

Methods

This was a single-centre, cross-sectional, web-based study in the outpatient pharmacy in a tertiary hospital in the Perak state of Malaysia. The outpatient pharmacy department has a patient load of 1000–1500 daily. Patients and caregivers aged 18 years and above, received at least one prescription refill using the pharmacy VAS services from April to September 2020 were included in this study.

The sample size was estimated according to a previous study, 85.7% of the patients were satisfied with the VAS.[13] Sample size was calculated using Raosoft Sample Size Calculator.[21] A minimum sample size of 187 was required, using 95% confidence interval, ±5% precision with an infinite population size. To allow for a 20% incomplete response, a total sample of 234 was required. Out of a total of 2500 patients registered for VAS, we invited 1200 patients to participate in this study. The first 300 patients registered for each of the four types of VAS were recruited. This consideration was that they had been using VAS for longer period of time as compared with patients who registered later. The subsequent patients in the list were considered if any of the first 300 patients declined the invitation.

The questionnaire was developed by the investigators by adapting a validated questionnaire.[13] The questionnaire was initially developed in the Malay language and subsequently translated to English and Mandarin. The adapted questionnaire then underwent face validation and content validation by two experts in the pharmacy field. The questionnaire was subsequently pre-tested on five respondents to ensure clarity. The final version of the questionnaire consisted of 3 major domains: (i) demographic characteristics of participants; (ii) satisfaction towards the pharmacy VAS (10 items measured based on a 5-point Likert scale from strongly disagree, disagree, neutral, agree to strongly agree); and (iii) suggestions for service improvement (one open-ended question).

A link (URL) of the online questionnaire was created and disseminated to the targeted population through short messages service (SMS). Once the respondent clicked the link, they were directed to the 'participant informed consent' page, respondents who selected the button 'I agree to participant' were then directed to the online questionnaire. On the other hand, those who clicked 'I do not agree to participate' were directed to an ending page.

Data analysis

Data were initially recorded in the Google Sheets, subsequently transferred, coded and analysed using the IBM SPSS statistical software version 20.0 (SPSS Inc, Chicago, IL, USA). Respondents' demographic characteristics and satisfaction scores were descriptively analysed, presented in frequency (percentages) and median (IQR). The Kruskal–Wallis test was used to analyse the differences of mean rank scores in the satisfaction domain across different demographic characteristics.

In the satisfaction domains which contained 10 items, each 'strongly disagree' response was given 1 point, and each 'strongly agree' response was given 5 points. The minimum satisfaction score was 1 and the maximum satisfaction score was 5. The mean score for each item was calculated by averaging the scores with the total number of respondents and presented in mean ± standard deviation, according to the original validated questionnaire.[13]

Multiple linear regression was employed to evaluate the association between respondents' demographic characteristics with their satisfaction towards pharmacy VAS, presented with beta coefficients (β), standard errors, *t*-value and *P*-value. Pearson correlation was performed to determine the relationship between total numbers of comorbidities with satisfaction scores. Multiple linear regression analysis was performed to determine the factors associated with the level of satisfaction. Statistically significant level was set at 5%. Thematic analysis was used in analysing open-ended question, with data presented in frequency (percentages).

Table 1 Demographic characteristics of respondents (*n* = 303)

Characteristics		*n* = 303, *n* (%)	Satisfaction scores[1] Mean rank	*P*-value[1]
Age of respondents[2]	Median (IQR)	56.0 (24.0)		
	Age range	18–85		
	18–35	36 (12.0)	133.36	<0.001
	36–59	145 (48.3)	133.51	
	>60	119 (39.7)	176.39	
Respondents' category	Patient	227 (74.9)	150.58	0.622
	Caregivers	76 (25.1)	156.24	
Number of prescriptions[3]	Median (IQR)	1.00 (1.00, 2.00)		
	Range	1–5		
	1	126 (52.3)	121.83	0.641
	2	56 (23.2)	118.42	
	3	25 (10.4)	114.28	
	4	21 (8.7)	139.98	
	5	13 (5.4)	106.31	
Number of medications[4]	Median (IQR)	4.00 (2.00, 6.00)		
	Range	1–20		
	1–5	173 (68.9)	124.35	0.510
	6–10	72 (28.7)	132.06	
	>10	6 (2.4)	100.92	
Gender	Male	160 (52.8)	154.23	0.634
	Female	143 (47.2)	149.50	
Ethnicity	Malay	86 (28.4)	149.75	0.766
	Chinese	156 (51.5)	149.94	
	Indian	57 (18.8)	162.55	
	Others	4 (1.3)	151.83	
Education	No formal education	3 (1.0)		
	Primary	1 (0.3)	105.38[5]	0.073
	Secondary	98 (32.3)	138.19	
	Diploma and above	201 (66.3)	159.66	
Occupation	Retiree	112 (37.0)	164.69	0.282
	Public servant	60 (19.8)	149.42	
	Private	54 (17.8)	148.43	
	Self-employed	34 (11.2)	149.75	
	Housewives	21 (6.9)	139.21	
	Others	22 (7.3)	118.91	
Income	Below RM 3000	147 (48.5)	145.15	0.636
	RM 3000–5000	78 (25.7)	161.28	
	RM 5001–7000	42 (13.9)	148.85	
	RM 7001–10 000	18 (5.9)	166.06	
	More than RM 10 000	18 (5.9)	161.03	
Residence	Within Kinta district	272 (89.8)	155.83	0.023
	Out of Kinta district	31 (10.2)	118.42	
Type of VAS services used	Appointment card	131 (43.2)	140.34	<0.001
	Drive-through	100 (33.0)	179.66	
	Medicine by post	53 (17.5)	147.09	
	Integrated Dispensing System	19 (6.3)	100.50	
Source of information	Counter of pharmacy staff	217 (71.6)	150.39	0.574
	SMS	35 (11.6)	146.03	
	Friends and family	20 (6.6)	162.88	
	Social media	15 (5.0)	144.93	
	Leaflet	10 (3.3)	200.50	
	Others	6 (2.0)	145.67	
Comorbidities	Diabetes	120 (39.6)		
	Hypertension	121 (39.9)		
	Hypercholesterolaemia	111 (36.6)		
	Heart disease	67 (22.1)		
	Eye disease	41 (13.5)		
	Skin disease	34 (11.2)		
	Psychiatric disease	30 (9.9)		
	Ear, nose, throat disease	28 (9.2)		
	Bone disease	27 (8.9)		
	Kidney disease	17 (5.6)		

Table 1 Continued

Characteristics		n = 303, n (%)	Satisfaction scores1 Mean rank	P-value1
	Cancer	16 (5.3)		
	Liver disease	12 (4.0)		
	Lung disease	8 (2.6)		
	Others	114 (37.6)		
Number of diseases	1	111 (36.6)		
	2	66 (21.8)		
	3	62 (20.5)		
	4	38 (12.5)		
	5	12 (4.0)		
	6	7 (2.3)		
	7	2 (0.7)		
	8	3 (1.0)		
	13	2 (0.7)		

[1]Kruskal–Wallis test was performed to detect the differences of mean rank across different groups.

[2]Missing data (n = 3).

[3]Missing data (n = 62).

[4]Missing data (n = 52).

[5]Combination of no formal education and primary school level.

Results

A total of 303 agreed to participate. The median age of the respondents was 56.0 (24.0) years. Majority of the respondents were male (160, 52.8%), Chinese (156, 51.5%), with tertiary education (201, 66.3%), retiree (112, 37.0%) and resided within the Kinta district (272, 89.8%) (Table 1).

Out of a maximum score of 5, the overall mean satisfaction score was 4.42 (SD: 0.55), ranged from 1 to 5. Among all, the respondents were most agreeable to time-saving benefits of the pharmacy VAS (4.56 ± 0.63). Majority of the respondents felt that pharmacy VAS had made their life easier (290, 95.7%) with mean score of 4.51 ± 0.65 and planned to recommend the pharmacy VAS to others (292, 96.4%) by giving an average of satisfaction score of 4.51 ± 0.61 (Table 2).

The mean rank satisfaction scores differed across age groups (P < 0.001), residential area (P = 0.023) and type of VAS services used (P < 0.001). Patients aged >60 years old, those resided within the Kinta district and those who used the drive-through services reported higher satisfaction scores (Table 1).

Multiple linear regression was performed to identify significant predictors for satisfaction on pharmacy VAS. Respondents aged more than 60 (versus age 18–35, β = 2.375, P < 0.001) and those who used drive-through service (versus SPUB, β = 2.272, P = 0.001) reported higher satisfaction scores (Table 3). There was no significant correlation between total number of comorbidities with the mean satisfaction scores (r = 0.040, P = 0.494).

Several suggestions were made for service improvement, including longer operating hours (18, 6.0%), upgraded communication system (9, 3.0%), smoother registration process (9, 3.0%), more polite staff (9, 3.0%), selection of preferred postage delivery time (6, 2.0%) and promotion of VAS (4, 1.3%) (Table 4).

Discussion

To the best of our knowledge, this is the first study reporting the satisfaction levels of patients and caregivers using the pharmacy VAS during the COVID-19 pandemic. The respondents demonstrated a high level of overall satisfaction towards the four types of VAS. Majority of them suggested extended hours of operation, more courteous staff, better communication system and a smoother registration process for VAS. While the previous studies evaluated a maximum of three types of VAS,[13, 22–24] this study evaluated four different types of VAS for satisfaction level among the users. This study describes the key factors affecting patients and caregivers' need with regard to pharmacy VAS, informing stakeholders on the possible gaps for improvement. The availability of questionnaire in Mandarin provides a wider choice of language options for participants. A self-administering online questionnaire without the presence of interviewers allows the respondent to freely provide their responses, and a semi-structured question at the end of questionnaire that allowed respondents to give their expectations on VAS in free text.

More than two-thirds of the respondents rated their satisfaction with mean scores of more than 4.0 out of a maximum of 5.0 irrespective of service types. Similar to the findings of previous studies, a range of 74.5–100% of respondents rated high level of satisfaction to pharmacy VAS.[10, 13, 22, 24] In the comparison of VAS against traditional counter service (TCS), a significant higher proportion of VAS users (77.8–96.2%) rated higher satisfaction scores than TCS users (63.1–89.4%).[13, 22, 23] This implied that VAS users are satisfied with this innovative method of medication dispensing that offers them more flexibilities to get their prescription refills when compared with the conventional dispensing service.

Patients who were retirees, more than 60 years of age, residing near to the hospital and utilization of drive-through service were associated with higher level of satisfaction to VAS. A study conducted in the northern region of Malaysia showed that VAS users with higher income demonstrated higher satisfaction level than those of lower income. The same study reported that older adults preferred TCS over VAS and among those that used VAS, drive-through service was the most preferred choice compared with mail pharmacy and call-and-collect. Mail pharmacy was the least preferred due to the cost incurred to the patients who requested this service.[13] In contrast, a study conducted at the south-central Peninsular Malaysia described that the users of mail pharmacy demonstrated better

Table 2 Satisfaction towards VAS services (n = 303)

Statement	Mean (SD)	Strongly disagree, n (%)	Disagree, n (%)	Neutral, n (%)	Agree, n (%)	Strongly agree, n (%)
I am satisfied with this pharmacy value-added service that I received	4.43 (0.65)	1 (0.3)	1 (0.3)	17 (5.6)	132 (43.6)	152 (50.2)
I do not have any problem with this pharmacy value-added service	4.39 (0.74)	2 (0.7)	4 (1.3)	23 (7.6)	119 (39.3)	155 (51.2)
This pharmacy value-added service has saved my time	4.56 (0.63)	2 (0.7)	1 (0.3)	8 (2.6)	105 (34.7)	187 (61.7)
This pharmacy value-added service has made my life easier	4.51 (0.65)	2 (0.7)	1 (0.3)	10 (3.3)	117 (38.6)	173 (57.1)
I can save more when using this pharmacy value-added service (e.g. transportation fee)	4.12 (0.85)	1 (0.3)	10 (3.3)	58 (19.1)	118 (38.9)	116 (38.3)
I always receive the correct type of medications via this pharmacy value-added service	4.31 (0.92)	13 (4.3)	3 (1.0)	8 (2.6)	133 (43.9)	146 (48.2)
I always receive the correct quantity of medications through this pharmacy value-added service	4.43 (0.69)	2 (0.7)	5 (1.7)	8 (2.6)	133 (43.9)	155 (51.2)
I am confident that my medicines have been checked thoroughly by the pharmacy	4.45 (0.61)	1 (0.3)	0 (0.0)	12 (4.0)	140 (46.2)	150 (49.5)
The label on medications that I received through this pharmacy value-added service is always complete and easy to understand	4.46 (0.64)	2 (0.7)	1 (0.3)	10 (3.3)	133 (43.9)	157 (51.8)
I will recommend this pharmacy value-added service to others	4.51 (0.61)	1 (0.3)	1 (0.3)	9 (3.0)	123 (40.6)	169 (55.8)

satisfaction compared with appointment card and integrated drug dispensing. This suggested that the VAS users' satisfaction level is largely affected by the choice of VAS selected by them.[22] This implied that the satisfaction level of VAS users could have been affected by demographic characteristics, geographical location and types of VAS selected by the users. Therefore, outpatient pharmacists need to consider these factors when recommending the type of VAS to the patients to gain highest satisfaction among patients.

It is noteworthy that the types of VAS evaluated in each study were limited by the availabilities of VAS offered by the respective health institution. In addition, as discussed by the previous study,[22] patients could only select the VAS based on the availability of VAS, and the choice of VAS is also limited by the pharmaceutical dosage form of the medication. For instance, currently, mail pharmacy is not an option for patients prescribed with psychotropic medications or medications requiring storage at low temperatures. This has caused difficulties for researchers to compare the satisfaction level among different types of VAS in the presence of such limitations. There is no single standard measure of patient satisfaction applicable to all pharmacy situations.

Users who selected pharmacy drive-through service had positive correlation with the satisfaction levels of VAS after adjusting other factors. High satisfaction levels were seen in users of pharmacy drive-through services evaluated in a previous study, which indicated that as high as 69.2% of the users rating this service 'very satisfied' and 30.8% rated 'satisfied', mainly due to convenience, short waiting time and problem rectification in a timely manner.[24] Insufficient parking lots, congested patients waiting area and long waiting time have been the major issues encountered by most of the tertiary hospitals globally. The introduction of drive-through pharmacy is able to ease these problems among the elderly, working adults and parents with young children who require to refill their medication on long-term basis.[25] In line with the WHO guidelines during the outbreak of COVID-19 pandemic,[26] elderly patients, who are associated with higher risks of mortality with coronavirus infection,[27] are encouraged to select drive-through services to avoid the crowds and limit the contact with others.[28] Drive-through pharmacy also has been encouraged locally and in Australia during the ongoing pandemic of COVID-19 as a safety measure for the public especially the elderly to get their medication because the nature of this service enables the practice of physical distancing and it has been a proven efficient and safe method of medication dispensing.[28, 29] In spite of many advantages of drive-through services, it is important to note that this service would be of maximum benefit for citizens who own a vehicle and when the hospital is faced with inadequate car parks.[30–33]

Respondents expect pharmacy staff to be more polite and courteous. Evidence showed that pharmacist attitude is positively correlated with patient satisfaction visiting pharmacy department of public hospitals.[34–36] The patients receiving pharmaceutical care service would expect the pharmacy personnel to be pleasant and courteous,[35] and show good attitude to them.[37] Previous study proposed that satisfactions of VAS users might be affected by the attitude of pharmacists and questions assessing this context can be explored in future surveys.[13] Meanwhile, researchers could consider exploring factors affecting the attitude of pharmacy personnel when delivering VAS to the users.

The need to upgrade communication systems was suggested by respondents to improvise VAS. Effective communication was identified as one of the important elements to improve customer satisfaction in outpatient pharmacy service.[22, 38] Establishing a single point of contact for all incoming queries can be adapted such that it

Table 3 Multiple linear regression for significant factors associated with satisfaction on value-added services (*n* = 303)

Variable	Simple linear regression			Multiple linear regression		
	Crude *b* (SE)	*t*-statistics	*P*	Adjusted *b* (SE)	*t*-statistics	*P*
Age, years				2.375 (0.626)	3.791	<0.001
18–35						
36–59	0.006 (0.997)	0.006	0.995			
>60	2.707 (1.018)	2.658	0.008			
Respondents' category						
Patient						
Caregivers	–0.185 (0.726)	–0.255	0.799	–	–	–
Number of prescriptions						
1						
2	0.155 (0.943)	0.015	0.870			
3	–0.064 (1.076)	–0.005	0.953	–	–	–
4	–0.102 (1.066)	–0.008	0.924			
5						
Number of medication						
1–5						
6–10	0.489 (0.705)	0.693	0.489	–	–	–
>10	–1.525 (2.088)	–0.730	0.466			
Gender						
Male						
Female	–0.604 (0.630)	–0.959	0.338	–	–	–
Ethnicity						
Malay						
Chinese	0.019 (0.738)	0.026	0.979			
Indian	–0.043 (0.984)	–0.044	0.965	–	–	–
Others	–0.603 (1.694)	–0.356	0.722			
Education						
Primary or below						
Secondary	4.602 (2.775)	1.659	0.098	–	–	–
Diploma and above	5.542 (2.747)	2.018	0.044			
Occupation						
Government						
Private	0.622 (1.021)	0.609	0.543			
Self-employed	0.861 (1.169)	0.736	0.462	–	–	–
Housewives	0.138 (1.380)	0.100	0.920			
Retiree	1.665 (0.871)	0.147	0.057			
Others	–1.388 (1.357)	–0.066	0.307			
Residence						
Within Kinta district				–	–	–
Out of Kinta district	–2.160 (1.031)	–2.094	0.037			
Type of VAS services used						
Integrated dispensing						
Drive-through	4.446 (1.335)	3.330	0.001	2.272 (0.650)	3.496	0.001
Medicine by post	2.224 (1.426)	1.559	0.120			
Appointment card	1.931 (1.310)	1.474	0.141			
Household income						
Below RM 3000						
RM 3000–5000	0.877 (0.769)	1.140	0.255			
RM 5001–7000	–0.156 (0.960)	–0.163	0.871	–	–	–
RM 7000–10 000	–0.307 (1.371)	–0.224	0.823			
>RM 10 000	1.026 (1.371)	0.749	0.455			

SE: standard error. Stepwise multiple linear regression analysis.

serves as a centralized system to streamline the registration process, real-time communication between pharmacy personnel should any issue arise and alert the users to collect their medication based on the types of VAS they selected. The communication can be improved by creating service desk automation software,[39] such as mobile application, that are equipped with the capabilities of voice calling, video conferencing, text, e-mail and social media, suited to the preference of the customers.[40]

The limitations of this study include findings of a single-centre study may not be generalizable to other centres as the types of VAS services may vary between health institutions. In addition, our study did not compare the satisfaction level between VAS and TCS users, hence the satisfaction of existing TCS users especially among the elderly is unknown. The timing of data collection would affect the satisfaction of the users,[34] this survey was conducted during the pandemic in which the use of VAS could be a preferred option as it

Table 4 Respondents' suggestions to improve pharmacy value-added services

Variables	$n = 303$, n (%)
Extend operation hours	18 (6.0)
Staff to be more polite and courteous	9 (3.0)
Upgrade customer support system	9 (3.0)
Smoothen VAS registration process	9 (3.0)
Selection of preferred postage delivery time	6 (2.0)
Intensification of value-added services promotion	4 (1.3)
To provide at least 2 months medication supply	4 (1.3)
Interchangeable VAS	4 (1.3)
Pharmacist to countercheck quantity and types of medication	2 (0.7)
To print one copy of prescription for patient as reference	2 (0.7)
To ensure the medication is ready on appointment date	1 (0.3)
To improve clarity medication label printing	1 (0.3)
To expand the services to other institutions	1 (0.3)
To expand some of the VAS for different categories of patients (postage for psychotropic drugs)	1 (0.3)
No suggestion/not relevant to VAS	225 (74.2)

allowed the users to practice physical distancing [41] and this factor could have contributed to high satisfaction levels.

Future research should consider assessing the satisfaction level of TCS users and the reasons of not selecting VAS in which the findings could be used as a reference for VAS improvement as well as the overall flow of outpatient dispensing activities. Other limitations are recall-bias among the users of VAS and the use of convenient sampling may lead to selection bias of the study population.

Conclusion

Majority of the VAS users demonstrated high levels of satisfaction. Older adults and those who used drive-through pharmacy services demonstrated higher level of satisfaction. Extending duration of service, improving politeness of frontline staff and upgrading of communication systems may potentially improve the clients' satisfaction. Future studies should compare the satisfaction of VAS with TCS and compare the level and factors affecting the satisfaction between the two groups of users. Health policymakers should consider establishing a standardized communication system to streamline the process of using VAS.

Author Contributions

L.S.C. and Y.L.Y. initiated the idea of this research work and finalized the proposal. C.T.C. drafted proposal collected and analysed data and draft the manuscript. C.C.C. contributed to the proposal drafting, data analysis and first draft of the manuscript. D.G. and P.R. provided administrative support and supervision. All authors proofread and approve the final version of this manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval and Consent to Participate

This study was registered in the Malaysia National Medical Research Registry (NMRR-20-1933-56243) and obtained the approval of Malaysian Medical Research and Ethics Committee (MREC). All research procedures were conducted according to the Malaysian Guidelines for Good Clinical Practice (4th edition) and other relevant guidelines for research. Only participants above 18 were included, all participants informed consent were obtained before collecting their data.

Consent for Publication

All authors agreed to submit to Journal of Pharmaceutical Health Services Research for publication.

Data Availability

The datasets generated and/or analysed during this study are not publicly available due to the confidentiality of patients but are available from the corresponding author on reasonable request.

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