

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

Lan-Sim CHEW

Pharmacy Department, Hospital Raja Permaisuri Bainun

Yee-Ling YEO

Pharmacy Department, Hospital Raja Permaisuri Bainun

Chee-Tao CHANG (✉ davidcct.crc@gmail.com)

Clinical Research Centre, Hospital Raja Permaisuri Bainun

Chii-Chii CHEW

Clinical Research Centre, Hospital Raja Permaisuri Bainun

Doris GEORGE

Pharmacy Department, Hospital Raja Permaisuri Bainun

Philip RAJAN

Clinical Research Centre, Hospital Raja Permaisuri Bainun

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Abstract

Background

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

Methods

This was a single-center, 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 services 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).

Results

Out of 333 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 (vs. age 18-35, $\beta=2.375$, $p<0.001$) and those who used drive-through service (vs. SPUB, $\beta=2.272$, $p=0.001$) 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 value-added services (4, 1.3%)

Conclusion

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 contributed to the users' satisfaction.

Introduction

According to the World Health Organization (WHO), patient satisfaction is defined as patients' evaluation of the care provided relative to their expectations [1]. A better patients' 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 patients' satisfaction [7, 8]. Hence, the pharmacy value-added services (VAS) was 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 United States, 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 value-added services (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.

The Coronavirus disease (COVID-19) was announced as a pandemic on the 10th of March 2020. The Ministry of Health, Malaysia implemented various strategies to curtail the infection, including physical distancing [18]. 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 four out of five patients refilled their medication using the pharmacy VAS in 2020, in comparison to two out of five in year 2019 [19]. 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 value-added services in the hospital and to explore their expectations for value-added service improvement.

Methods

This was a single-center, 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.

We used the pharmacy VAS patient registration database for convenient sampling purposes. The sample size was estimated according to a previous study, 85.7% of the patients were satisfied with the value-added services [13]. Sample size was calculated using Raosoft Sample Size Calculator [20]. A minimum sample size of 187 was required, using 95% confidence interval, $\pm 5\%$ precision with an infinite population size. To allow for a 20% incomplete response, a total sample of 234 was required.

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 questionnaire consisted of 3 major domains: i. demographic characteristics of participants; ii. satisfaction towards the pharmacy VAS (ten item 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 participate' 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 was initially recorded in the Google Sheets, subsequently transferred, coded and analysed using the IBM SPSS statistical software version 20.0 (SPSS Inc, Chicago, Illinois). Respondents' demographic characteristics and satisfaction scores were descriptively analyzed.

In the satisfaction domains, 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.

The independent t-test and one-way analysis of variance (ANOVA) were used to analyze the differences of mean scores in the satisfaction domain across different demographic characteristics. 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.

Results

Out of 333 invited patients and caregivers, 303 agreed to participate (response rate: 91%). The mean age of the respondents was 53.7 ± 14.7 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 satisfaction scores differed across age groups ($p < 0.001$), occupation ($p < 0.001$), residential area ($p = 0.037$) and type of VAS services used ($p < 0.001$). Patients aged > 60 years old, retiree, 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 (vs. age 18–35, $\beta = 2.375$, $p < 0.001$) and those who used drive-through service (vs. SPUB, $\beta = 2.272$, $p = 0.001$) 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 value-added services (4, 1.3%) (Table 4).

Table 1
Demographic characteristics of respondents (n = 303)

Characteristics		n = 303, n (%)	Satisfaction scores Mean (SD)	p-value#
Age of respondents	Mean (standard deviation)	53.7 (14.7)		
	Age range	18–85		
	18–35	36 (12.0)	4.31 (0.56)	< 0.001
	36–59	145 (48.3)	4.31 (0.58)	
	> 60	119 (39.7)	4.58 (0.47)	
Respondents' category	Patient	227 (74.9)	4.42 (0.49)	0.799
	Caregivers	76 (25.1)	4.40 (0.68)	
Number of prescriptions	Median (IQR)	1.00 (1.00, 2.00)		
	Range	1 to 5		
	1	126 (52.3)	4.44 (0.46)	0.76
	2	56 (23.2)	4.42 (0.50)	
	3	25 (10.4)	4.38 (0.60)	
	4	21 (8.7)	4.53 (0.51)	
5	13 (5.4)	4.32 (0.62)		
Number of medications	Median (IQR)	4.00 (2.00, 6.00)		
	Range	1–20		
	1 to 5	173 (68.9)	4.44 (0.48)	0.57
	6 to 10	72 (28.7)	4.49 (0.53)	
	> 10	6 (2.4)	4.28 (0.66)	
Gender	Male	160 (52.8)	4.45 (0.46)	0.338
	Female	143 (47.2)	4.39 (0.63)	
Ethnicity	Malay	86 (28.4)	4.42 (0.51)	0.986

#Notes: Student's t-test and one-way ANOVA was performed to detect the differences of mean scores across different groups

Characteristics		n = 303, n (%)	Satisfaction scores	p-value#
			Mean (SD)	
	Chinese	156 (51.5)	4.42 (0.47)	
	Indian	57 (18.8)	4.41 (0.77)	
	Others	4 (1.3)	4.36 (0.72)	
Education	No formal education	3 (1.0)		
	Primary	1 (0.3)	3.90 (0.99) ^	0.062
	Secondary	98 (32.3)	4.36 (0.48)	
	Diploma and above	201 (66.3)	4.45 (0.56)	
Occupation	Retiree	112 (37.0)	4.51 (0.49)	0.001
	Public servant	60 (19.8)	4.34 (0.75)	
	Private	54 (17.8)	4.41 (0.45)	
	Self-employed	34 (11.2)	4.43 (0.44)	
	housewives	21 (6.9)	4.36 (0.48)	
	Others	22 (7.3)	4.21 (0.54)	
Income	Below RM 3,000	147 (48.5)	4.39 (0.52)	0.091
	RM 3,000-RM5,000	78 (25.7)	4.48 (0.48)	
	RM 5,001-RM 7,000	42 (13.9)	4.38 (0.54)	
	RM 7,001-RM 10,000	18 (5.9)	4.36 (0.98)	
	More than RM 10,000	18 (5.9)	4.49 (0.54)	
Residence	Within Kinta district	272 (89.8)	4.44 (0.55)	0.037
	Out of Kinta district	31 (10.2)	4.22 (0.52)	
Type of VAS services used	Appointment card	131 (43.2)	4.34 (0.59)	< 0.001
	Drive-through	100 (33.0)	4.59 (0.46)	
	Medicine by Post	53 (17.5)	4.37 (0.53)	
	Integrated Dispensing System	19 (6.3)	4.15 (0.45)	

#Notes: Student's t-test and one-way ANOVA was performed to detect the differences of mean scores across different groups

Characteristics		n = 303, n (%)	Satisfaction scores Mean (SD)	p-value#
Source of Information	Counter of pharmacy staff	217 (71.6)		
	SMS	35 (11.6)		
	Friends and family	20 (6.6)		
	Social media	15 (5.0)		
	Leaflet	10 (3.3)		
	Others	6 (2.0)		
Comorbidities	Diabetes	120 (39.6)		
	Hypertension	121 (39.9)		
	Hypercholesterolemia	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)		
	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)		

#Notes: Student's t-test and one-way ANOVA was performed to detect the differences of mean scores across different groups

Characteristics	n = 303, n (%)	Satisfaction scores Mean (SD)	p-value#
5	12 (4.0)		
6	7 (2.3)		
7	2 (0.7)		
8	3 (1.0)		
13	2 (0.7)		
#Notes: Student's t-test and one-way ANOVA was performed to detect the differences of mean scores across different groups			

^combination of no formal education and primary school level

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)

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 prescriptions						
1–5						
6–10	0.489 (0.705)	0.693	0.489	-	-	-
> 10	-1.525 (2.088)	-0.730	0.466			
Gender						

SE: standard error

Notes: Stepwise multiple linear regression analysis. Multicollinearity and interaction term were checked and not found (tolerance < 1.00 and VIF < 10). Linear relationship between the independent and outcome variable was checked using scatter plot of residuals. Normality of response variable was checked using histogram and box-plot of residuals. Model assumptions are fulfilled.

Variable	Simple linear regression			Multiple linear regression		
	Crude b (SE)	t-statistics	P	Adjusted b (SE)	t-statistics	P
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				-	-	-

SE: standard error

Notes: Stepwise multiple linear regression analysis. Multicollinearity and interaction term were checked and not found (tolerance < 1.00 and VIF < 10). Linear relationship between the independent and outcome variable was checked using scatter plot of residuals. Normality of response variable was checked using histogram and box-plot of residuals. Model assumptions are fulfilled.

Variable	Simple linear regression			Multiple linear regression		
	Crude b (SE)	t-statistics	P	Adjusted b (SE)	t-statistics	P
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 3,000						
RM 3,000 to RM 5,000	0.877 (0.769)	1.140	0.255			
RM 5,001 to RM 7,000	-0.156 (0.960)	-0.163	0.871	-	-	-
RM 7,000 to RM 10,000	-0.307 (1.371)	-0.224	0.823			
> RM 10,000	1.026 (1.371)	0.749	0.455			
SE: standard error						
Notes: Stepwise multiple linear regression analysis. Multicollinearity and interaction term were checked and not found (tolerance < 1.00 and VIF < 10). Linear relationship between the independent and outcome variable was checked using scatter plot of residuals. Normality of response variable was checked using histogram and box-plot of residuals. Model assumptions are fulfilled.						

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 drug)	1 (0.3)
No suggestion/ not relevant to VAS	225 (74.2)

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 when using VAS. While the previous studies evaluated a maximum of three types of VAS [13, 21–23], this study evaluated four different type VAS for satisfaction level among the users. This study describes the key factors affecting patients and caregivers' need with regards to pharmacy VAS, informing stakeholders on the possible gaps for improvement.

We also translated the questionnaire into Mandarin, providing a wider choice of language options for participants. The study was designed as a self-administering online questionnaire without the presence of interviewers that 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.

At least 77.2% 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 to 100% of respondents rated high level of satisfactions to pharmacy VAS [10, 13, 21, 23]. In contrast, patients satisfaction level with the outpatient pharmacy services varied between 1.5 and 87.5% [12, 24–31]. In the comparison of VAS against traditional counter service (TCS), a significant higher proportion of VAS users (77.8 to 96.2%) rated higher satisfaction scores than TCS users (63.1 to 89.4%) [13, 21, 22]. This implied that VAS users are satisfied with this innovative method of medication dispensing that offer them more flexibilities to get their prescription refills when compared to the conventional dispensing service that requires them to come to the counter and wait to get their medication prepared by pharmacy staff.

Being a retiree, more than 60 years of age, residing near to the hospital and utilisation of drive-through service were significant predictors for higher score of satisfaction to VAS. In contrast, a previous study showed that satisfaction level of older adults and female users were negatively correlated with VAS while users with higher income had their satisfaction level positively correlated with VAS [13]. Types of VAS selected by users were recognized as one of the factors affecting users' satisfaction level [21]. Another study showed that users of mail pharmacy services demonstrated a lower satisfaction level than drive-through and call-and-collect service as users are required to pay for the mail service [13]. On the other hand, other studies study show that users of mail pharmacy demonstrated a better satisfaction compared to TCS [22] or other types of VAS such as integrated drug dispensing system [21]. It is postulated that the factors affecting the satisfaction level of VAS users could have been unique for geographical location, health institutions and types of VAS selected.

It is noteworthy that 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 [21], patients could only select the VAS based on the availability of VAS, and the selection 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 medications requiring storage at low temperatures, dangerous drugs or psychotropic medications. This has render 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 [23]. 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 [32]. In line with the WHO guidelines during the outbreak of COVID-19 pandemic in 2020 [33], elderly patients, who are associated with higher risks of mortality with coronavirus infection [34], are encouraged to select drive-through services in order to avoid the crowds and limit the contact with others [35]. Drive-through pharmacy also has been encouraged locally and in Australia during the on-going 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 [35, 36]. 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 carparks [37–40].

Respondents expect pharmacy staff to be more polite and courteous. Evidence showed that pharmacist attitude is positively correlated with patients' satisfaction visiting pharmacy department of public hospitals [41–43]. The patients receiving pharmaceutical care service would expect the pharmacy personnel to be pleasant and courteous [42], and show good attitude to them [44]. Previous study proposed that satisfactions of VAS users might be affected by the attitudes 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 out-patient pharmacy service [21, 45]. Establishing a single point of contact for all incoming queries can be adapted such that it serves as a centralised 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 leveraged including creating service desk automation software [46], 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 [47].

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, the satisfaction of existing TCS users especially among the elderly is therefore unknown. The timing of data collection would affect the satisfaction of the users [41], this survey was conducted during the pandemic in which the use of VAS could be a preferred option as it allowed the users to practice physical distancing 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 out-patient 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 standardize communication system to streamline the process of using VAS.

Declarations

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 Good Clinical Practice (4th edition) and other relevant guidelines for research. Only subjects above 18 were included, all participants informed consent were obtained prior to collecting their data.

Consent for publication: All authors agreed to submit to BMC Health Services Research for publication.

Availability of data and materials: The datasets generated and/or analysed during the current study are not publicly available due to confidentiality of patients, but are available from the corresponding author on reasonable request.

Competing Interest: The authors declare no conflict of interest.

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Authors' contributions: LS and YL initiated the idea of this research work and finalised the proposal. CT drafted proposal collected and analysed data and draft the manuscript. CC contributed to the proposal drafting, data analysis and first draft of the manuscript. DG and PR provided administrative support and supervision. All authors proofread and approve the final version of this manuscript.

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