





Public Perceptions About Home Delivery of Medication Service and Factors Associated with the Utilization of This Service

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Introduction: Home medication delivery service is a major service for the public. It reduces overcrowding and unnecessary visits to health centers. This study aims to investigate the public perception of home delivery of medication service in Jordan and evaluate factors affecting the use of this service.

Methods: The study was conducted in March 2022 using an online survey. Participants were asked to fill out a validated questionnaire to evaluate their perception of home delivery of medication service.

Results: Among the 1032 adult participated in this study, the majority reported that they had heard of home delivery of medication service (n = 832, 80.6%). However, only 30.9% of them have used this service before. Results showed that 71.4% of the participants (n = 737) believe that home delivery of medication service is more convenient and accessible than in-store drug refill. In addition, 65.6% of the participants (n = 677) believed that home delivery of medication service is suitable only for refill-prescription drugs (65.0%). The main pros of the service as perceived by the study participants were to serve sick patients, elderly, and disabled people (n = 822, 79.7%). In contrast, the inability of patients to build a professional relationship with pharmacists using home delivery of medications service was the most perceived con of this service (n = 627, 60.8%). Finally, regression analysis revealed that older participants, those with chronic diseases, and those who visit community pharmacies two times or more per month revealed higher use of the service (P = <0.05).

Conclusion: This study has shown that most participants showed positive perceptions toward the home delivery of medication services. However, participants believed that this service may decrease pharmacist's patient contact time, thus affecting the quality of medication counseling. More comprehensive future studies are necessary to examine the financial aspects of such a service and its associated drawbacks.

Keywords: community pharmacy, home delivery of medication, perception, public, Jordan

Introduction

Pharmacies are one of the most accessible and frequently used front-line health-care entities where the pharmacists are in a unique position to act as an intermediary between the doctor and the patient and provide both medicines and free medical advice without the need for an appointment¹. Community pharmacies offer a wide range of services. In the UK, for instance, pharmacist provides traditional services such as dispensing medications in addition to locally commissioned services including a wide range of medications and public health services, such as minor ailments (assessment and management of minor conditions by pharmacists), smoking cessation, lifestyle advice, emergency hormonal contraception, substance misuse, screening, and vaccinations.^{2,3} Moreover, community pharmacies are currently adopting improvements to include training on

the social determinants of health to aid diverse communities, collaboration with local health and social services, and being proactive with current incidents such as COVID-19 and how clinics can actively combat them⁴.

During the COVID-19 pandemic, physical distancing became of the highest importance. As a result, it is essential that patients are able to communicate virtually with the pharmacists to refill their prescriptions or ask questions about medication management⁵. Some home delivery pharmacy initiatives were implemented successfully, for example in China, Cape Town, South Africa, and Qatar.^{6–8} Home delivery of medication is a service provided by pharmacies to deliver prescription and non-prescription medications to patients at their homes⁹. In Jordan, the government regulatory authorities granted a special allowance to implement home delivery and internet pharmacy because it is not permitted in standard practice¹⁰.

In the United States (US), home medication delivery via mail order accounts for at least 25% of pharmacy sales, with higher rates among people aged 65 years and up¹¹. A growing body of research suggests that such service correlates with better medication adherence in patients with diabetes,^{12–16} and among other chronic conditions.^{8,16–20} Schmittiel et al reported that home delivery of medication via mail order improved patients' access to medications, especially for those with disabilities²¹. It is also associated with better health-related outcomes and reduced costs.^{17,21–24}

Home medication delivery service significantly reduces overcrowding and unnecessary visits to health centers. Moreover, it allows the patients to receive their medications without interruption during critical times. On the other hand, it is worth mentioning that it may also contribute to medication errors if not properly implemented through a structured system with close monitoring. While according to the National Pharmacy Association, home delivery of medications may lead to 9% of errors²⁵. The most common types of these errors include for instance, medicines delivered to wrong patients, wrong labelling in the delivered package, inappropriate patient counseling, and suboptimal medication therapy management.^{25,26}

As such, more research is needed to explore this service, and maximize the benefit from it by understanding the public perspective⁸. Thus, the aims of this study are to investigate the public's perception of the home delivery of medication service that was offered by some community pharmacies in Jordan and to evaluate factors affecting the use of this service. Highlighting on this important aspect will direct us on what types of endorsements should be adopted to properly apply home delivery of medicines for the sake of the best possible patient outcomes.

Methods

Study Design and Participants

This survey-based cross-sectional study was conducted in March 2022 to evaluate public perception toward home delivery of medication services in Jordan. The study was conducted via an online survey that was uploaded on the Google Form platform, and it was then distributed through different social media platforms (Facebook and WhatsApp). Participants were recruited if they were adults (18 years old or above), and reside in Jordan.

Questionnaire Development

The study questionnaire was developed based on Abu-Farha et al²⁷, the initial draft of the questionnaire was developed in English, and three independent academic pharmacists conducted content and face validation. Their evaluation focused on the content of the survey, the comprehensiveness, clarity of items involved, and the appropriateness of the selected Likert scales. The questionnaire was then revised and amended to their feedback. The final questionnaire contained closed-ended questions and was designed to be completed within 5 minutes, and it was translated to Arabic following the forward-backward translation method.

The final questionnaire contained five different sections. The general part of the questionnaire included the socio-demographic information of the study participants. The second section offers an assessment of the public awareness about home delivery of medication service and their level of support for this service (4 questions). The third section addresses the public perception towards the difference between home delivery of medication service and in-store refill of medications (6 statements). The fourth section intended to evaluate public perceptions toward the pros of using home delivery of medication services (5 statements), while the last section assessed the public perception of the cons attained from using this service (7 statements). The Likert Scale was used to document responses for the last three sections Scale

where “5: strongly agree”, “4: agree”, “3: neutral”, “2: disagree”, or “1: strongly disagree”. The internal consistency and reliability of the questionnaire were assessed using Cronbach’s α for the last three domains; values of 0.798, 0.875, and 0.832 were obtained for the third, fourth and fifth domains, respectively. This indicates an excellent internal consistency.

Sample Size Calculation

The researcher used the following formula to calculate the sample size: $n = P \times (1 - P) \times z^2/d^2$. A confidence level of 0.95 was used in this study and the desired precision was 5%. Considering the most conservative proportion of the public using this service as $P = 50\%$, the minimum number of subjects was found to be 385.

Ethical Considerations

The ethics committee at Applied Science Private University (Approval number 2022-PHA-4) granted their approval to conduct this study. The study followed the ethical standards outlined in the World Medical Association Declaration of Helsinki guideline²⁸. Before filling out the online survey, participants were offered a brief description of the study and its objectives, and they were also assured of the anonymity of the study and that their participation is voluntary. For those who choose to participate, an electronic consent has to be given at the beginning of the questionnaire by selecting “agree to participate”, once the consent is given participants were allowed to proceed to fill out the study questionnaire. For those who select “disagree to participate” the survey will be submitted automatically without filling out the questionnaire.

Statistical Analyses

Data were analyzed using the statistical package for social science (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). Frequency/percentage was utilized for qualitative variables. Chi-square analysis was used to compare participants’ perception towards the pros and cons between those with chronic disease and those without.

Logistic regression analysis was carried out to screen for the independent factors affecting participants’ previous use of home delivery of medication service. Following simple logistic regression, any variable with a P-value <0.250 was considered eligible for entry in multiple logistic regression analysis. All variables were checked for any absence of multicollinearity before performing multiple logistic regression analysis (ie, Pearson correlation coefficient <0.9 for any two variables). A P-value of ≤ 0.05 was deemed statistically significant when identifying factors affecting participants’ previous use of home delivery of medication service.

Results

During the study period, a total of 1032 adult participants agreed to take part in this study. The median age of the participants was 35.0 years (IQR = 19.0), and around two-thirds of them ($n = 690$, 66.9%) were females. More than half of the participants ($n = 571$, 55.3%) held a graduate or post-graduate degree, and 59.4% ($n = 613$) were married. Moreover, the majority of participants (848, 82.2%) reported having a monthly income of 800 JD or less, and around half of them revealed that they have children ($n = 582$, 56.4%), and only 20.0% of them ($n = 206$) reported having chronic diseases. Around 52% of the participants ($n = 540$, 52.3%) mentioned visiting community pharmacies at least two twice per month. For more details about the socio-demographic characteristics of the participants, refer to [Table 1](#).

Regarding participants’ awareness of the home delivery of medication service ([Table 2](#)), most of them reported that they had heard about this service ($n = 832$, 80.6%). However, only 30.9% of them have used this service before. In addition, 73.8% of the participants ($n = 762$) believe that this service would make pharmacy service more efficient, and around 78% of them ($n = 806$) support the introduction of this service in Jordanian community pharmacies.

Regarding public perceived differences between home delivery of medication service and in-store drug refill ([Figure 1](#)), results showed that 71.4% of the participants ($n = 737$) believed that home delivery of medication service is more convenient and accessible than in-store drug refill. In addition, 65.6% of the participants ($n = 677$) believed that home delivery of medication service is suitable only for refill-prescription drugs (65.0%), and 57.9% of them ($n = 598$) thought that this service is applicable only for Over the Counter (OTC) medications. On the other hand, participants assumed that pharmacists providing this service might be less available to answer patients’ questions ($n = 659$, 63.9%),

Table 1 Sociodemographic Characteristics of the Study Participants (N = 1032)

Parameters	n (%)
Age (years)	
o 18–27	326 (31.6)
o 28–37	269 (26.1)
o 38–47	258 (25.0)
o 48–57	131 (12.7)
o >57	36 (3.5)
o Missing data	12 (1.2)
Gender	
o Female	690 (66.9)
o Male	342 (33.1)
Educational level	
o Not educated	27 (2.6)
o School level	192 (18.6)
o University students	231 (22.4)
o University graduate	420 (40.7)
o Post-graduate	151 (14.6)
Marital status	
o Married	613 (59.4)
o Others (Single, divorced, or widowed)	419 (40.6)
Monthly income	
o <400 JD*	510 (49.4)
o 401–800 JD/month	338 (32.8)
o 801–1200 JD/month	124 (12.0)
o >1200 JD/month	60 (5.8)
Place of residence	
o Center of Jordan	470 (45.5)
o North of Jordan	493 (47.8)
o South of Jordan	69 (6.7)
Do you have children?	
o No	450 (43.6)
o Yes	582 (56.4)
Do you suffer from chronic diseases?	
o No	826 (80.0)
o Yes	206 (20.0)
Frequency of visiting a community pharmacy per month	
o 0–1 time/month	492 (47.7)
o ≥ 2 times/month	540 (52.3)

Note: *1 JD equals to 0.71 US Dollar.

Abbreviation: IQR, Interquartile range.

might not be able to explain important issues about medications (n = 633, 61.3%), and provide fewer written information to patients (n = 560, 54.3%).

Concerning the perceived pros of home delivery of medication (Table 3), the most perceived pros were serving sick patients, elderly, and disabled people (n = 822, 79.7%), continuing life-saving medical treatment without risking exposure during pandemics (n = 811, 78.6%), and being more convenient for parents with children at home (n = 804, 77.9%). No significant differences in participants' perceptions regarding the pros of home delivery of medication were seen between those with chronic diseases and those without. On the other hand, the inability of patients to build a professional relationship with pharmacists using home delivery of medications service was the most perceived cons of this service (n = 627, 60.8%), followed by the possibility that this service may contribute to medication errors due to the

Table 2 Participants Awareness About Home Delivery of Medication Service, and Their Support to This Service (N = 1032)

Parameter	n (%)
Did you hear about the home delivery of medication service?	
o No	200 (19.4)
o Yes	832 (80.6)
Did you use the home delivery of medication service?	
o No	713 (69.1)
o Yes	319 (30.9)
Do you feel that the introduction of home delivery of medication service makes pharmacy services more efficient?	
o No/I do not know	270 (26.2)
o Yes	762 (73.8)
How supportive you are with introduction of home delivery of medication service in Jordanian community pharmacies?	
o Highly unsupportive	20 (1.9)
o Unsupportive	40 (3.9)
o Neutral	166 (16.1)
o Supportive	406 (39.3)
o Highly supportive	400 (38.8)

Note: Reproduced from Abu Hammour K, Abu Farha R, Rizik M, et al. Pharmacy drive-thru service in Jordan: assessing customers' awareness, perceptions and factors affecting the use of this service. *J Pharm Health Serv Res.* 2019;10(1):141–147. doi:10.1111/jphs.12245© 2022 Oxford University Press, All Rights Reserved.²⁷

nature of remote interaction (n = 603, 58.4%). The least reported con of home delivery of medications services was the high cost of transporting medication (n = 519, 50.3%). Other related cons are presented in Table 4. Participants with chronic diseases showed better perception towards the service compared to those without chronic diseases, where lower percentages believed that home delivery of medication contributes to communication errors (51.0% versus 59.4%, respectively, P = 0.028), may be associated with incorrect medication dispensed or delivered to patient (44.7 versus 54.5, respectively, P = 0.012), and restricts the opportunity for interaction with the pharmacist (48.5 versus 57.0%, respectively, P = 0.029).

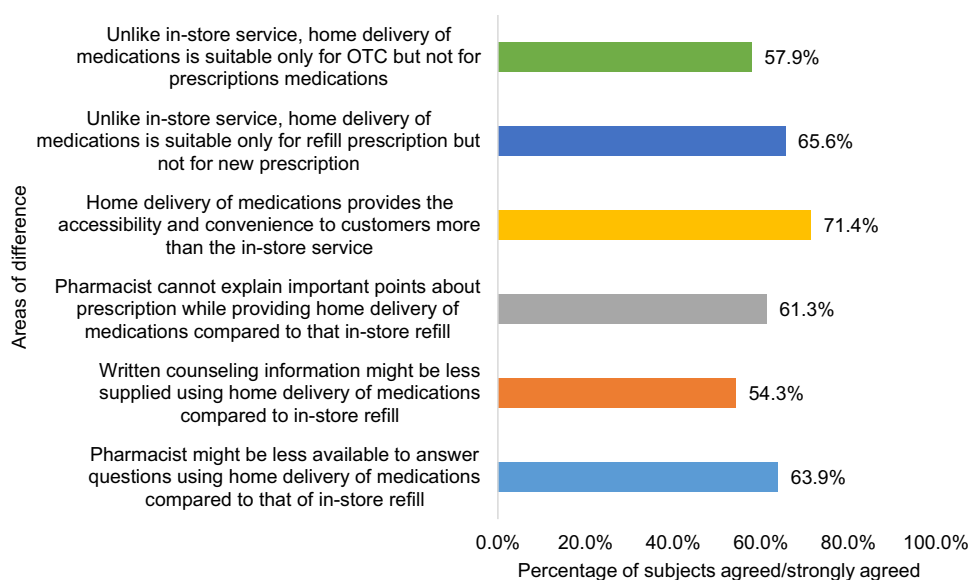


Figure 1 Participants perception towards the difference between home delivery of medication service and in-store refill of medications (n = 1032). OTC: over the counter.

Table 3 Participants' Perceptions Toward the Pros of Using Home Delivery of Medication Services as Compared Between Those with Chronic Diseases (N = 206) and Those Without (N = 826)

Statements	Percentages of Participants Strongly Agreed/Agreed n (%)			
	Total (n= 1032)	Those With Chronic Diseases (n= 206)	Those Without Chronic Diseases (n= 826)	P-value#
Using home delivery of medications services, patients have the opportunity to continue life-saving medical treatment without risking exposure during pandemics	811 (78.6)	155 (75.2)	656 (79.4)	0.191
Using home delivery of medications services, patients have significant cost savings in terms of transport.	627 (60.8)	113 (54.9)	514 (62.2)	0.053
Home delivery of medications services have the advantage of serving sick patients, elderly, disabled people	822 (79.7)	158 (76.7)	664 (80.4)	0.239
Home delivery of medications services are more comfortable for parents with children at home.	804 (77.9)	158 (76.7)	646 (78.2)	0.640
Implementing home delivery of medications services on a large scale will mean less congestion at health facilities.	787 (76.3)	149 (72.3)	638 (77.2)	0.138

Note: #Using Chi-square test.

Table 4 Participants' Perceptions Toward the Cons of Using Home Delivery of Medication Services as Compared Between Those with Chronic Diseases (N = 206) and Those Without (N = 826)

Statements	Percentages of Participants Strongly Agreed/Agreed n (%)			
	Total (n= 1032)	Those With Chronic Diseases (n= 206)	Those Without Chronic Diseases (n= 826)	P-value#
Patients might be unable to build a professional relationship with pharmacist using home delivery of medications service	627 (60.8)	113 (54.9)	514 (62.2)	0.053
Home delivery of medications services may contribute to communication errors between the patient and pharmacist	596 (57.8)	105 (51.0)	491 (59.4)	0.028*
Home delivery of medications services may contribute medication errors due to the nature of remote interaction	603 (58.4)	111 (53.9)	492 (59.6)	0.139
Home delivery of medications services is not convenient in providing drug information/counseling to patients (especially written information)	575 (55.7)	105 (51.0)	470 (56.9)	0.125
Using Home delivery of medications services may be associated with incorrect medication dispensed or delivered to patient	542 (52.5)	92 (44.7)	450 (54.5)	0.012*
Home delivery of medications services restrict the opportunity for interaction with the pharmacist because the pharmacist is not able to offer any level of interaction while delivering medications to home	571 (55.3)	100 (48.5)	471 (57.0)	0.029*
Home delivery of medications services are associated with excessive cost of transporting medication	519 (50.3)	93 (45.1)	426 (51.6)	0.099

Notes: #Using Chi-square test. *Significant at 0.05 significance level. Reproduced from Abu Hammour K, Abu Farha R, Rizik M, et al. Pharmacy drive-thru service in Jordan: assessing customers' awareness, perceptions and factors affecting the use of this service. *J Pharm Health Serv Res.* 2019;10(1):141–147. doi:10.1111/jphs.12245© 2022 Oxford University Press, All Rights Reserved.²⁷

Finally, logistic regression analysis (Table 5) revealed higher usage of the service among older participants (OR = 1.023, P = 0.002), those with chronic diseases (OR = 1.537, P = 0.014), and those who visit community pharmacies at least twice per month (OR = 1.880, P = <0.001).

Table 5 Assessment of Factors Associated with the Use of Home Delivery of Medications Service (N = 1032)

Parameter	Use of Home Delivery of Medication Service [0: Non-Users, 1: Previous Users]			
	OR	P-value#	OR	P-value\$
Age (years)	1.030	<0.001^	1.023	0.002*
Gender				
o Female	Reference			
o Male	1.334	0.041^	1.117	0.460
Educational level				
o University students or below	Reference			
o University graduate or above	1.206	0.170^	1.058	0.708
Marital status				
o Married	Reference			
o Others (Single, divorced, or widowed)	0.702	0.011^	1.014	0.952
Monthly income				
o ≤ 800 JD/month	Reference			
o > 800 JD/month	1.520	0.013^	1.231	0.261
Place of residence				
o Center of Jordan	Reference			
o Others (north or south of Jordan)	1.082	0.563	—	—
Do you have children?				
o No	Reference			
o Yes	1.484	0.004^	0.875	0.583
Do you suffer from chronic diseases?				
o No	Reference			
o Yes	2.130	<0.001^	1.537	0.014*
Frequency of visiting a community pharmacy per month				
o 0–1 time/month	Reference			
o ≥ 2 times/month	2.069	<0.001^	1.880	<0.001*

Notes: #Using simple logistic regression, \$Using multiple logistic regression, ^Eligible for entry in multiple logistic regression, *Significant at 0.05 significance level. Reproduced from Abu Hammour K, Abu Farha R, Rizik M, et al. Pharmacy drive-thru service in Jordan: assessing customers' awareness, perceptions and factors affecting the use of this service. *J Pharm Health Serv Res.* 2019;10(1):141–147. doi:10.1111/jphs.12245 © 2022 Oxford University Press, All Rights Reserved.²⁷

Discussion

The behavioral shift of patients towards adopting remote pharmaceutical services and filling prescriptions at home has become an increasingly more common practice.^{7,29–32} The COVID-19 pandemic has contributed to accelerating and expanding this service, aiming to decongest facilities and combat disease transmission, while meeting patients' demands⁹. However, many patients are not accustomed to these services, and the adaptability has been reported to be lower in low- and middle-income countries, which limited the implementation of these remote patient care services.^{9,10,33} In addition, home delivery of medication was not the standard practice in providing pharmaceutical care services in several countries across the globe until the surge of the 2019 pandemic. In Jordan, home delivery of medications has been recently launched; however, no clear policy from health authorities is in place yet. As such, we aimed to assess the public's perception of home delivery of medication services and perceived factors that may contribute to the utilization of this practice. Addressing public perception would be extremely important to define what types of approaches and measures should be adopted to facilitate its application and get more accessible for patients to get their medications, particularly the most vulnerable, for instance, senior and severely ill ones.

This study has shown that most participants believed that home delivery of medication services expanded the traditional role practiced in community pharmacy settings making the latter more convenient, efficient, and accessible

than in drug stores. However, only 30% of them benefited from this service. These findings showed a clear gap between the patient's willingness to use the service and its applicability. Nonetheless, we must take into account that, in reality, not all patients have the same needs.^{34–36} Many facts could explain this gap; firstly, the study was conducted via an online survey-based that was distributed through social media platforms inclining the study to selection bias, capturing mainly feedback from the younger population while underrepresenting the elderly, which are the population category that may benefit from home delivery of medication services. Secondly, the majority of participants were active young adults who can visit retail pharmacies and do not need easier access to get their medicines. Furthermore, this age group is healthier; less probably have chronic conditions that require a refill of their medicines routinely.

When questioning participants who will gain the most with medication delivery services, the majority believed that patients that refill prescriptions most probably due to a chronic illness are the most beneficiary group. This finding corroborates with previous similar studies that found that chronically ill patients take the most advantage of telepharmacy and home drug delivery.^{37,38} What was of concern is that more than 60% of participants believed that home drug delivery might decrease pharmacist-patient contact time, thus compromising important drug information the patient should be aware of. Indeed, this is a true reality; previous studies revealed that the absence of patient counseling could significantly increase the risk for medication errors.^{39,40} However, this is potentially riskier in senior, and chronically ill patients, as they are subjected to fall behind on refills due to the inability of many to attend drug stores in person. Besides the reduction in pharmacist patient contact time, previous studies have also shown that it may also contribute to low adherence and adverse event⁴¹.

Surprisingly, a recent study conducted in Thailand reported that the prevalence of drug-related problem from home drug delivery was as high as 49% and the most common type of errors was associated with change in drug packaging and drug brand. The latter may lead to confusion and precipitate other types of drug-related problems, such as patient's lack of compliance and adverse events in case the drug-related problem was not detected²⁶.

Recent studies have found that combining telehealth services through patient education and home drug delivery services would be a possible solution to ensure intense and complete patient care services.^{34,42} For all these delivery models to be implemented, we must bear in mind that community pharmacists are the mainstay contributors in the adoption of this contemporary pharmacy practices. To facilitate their practices in telepharmacy and home drug delivery services, regulations need to be established to organize these circuits in a way that do not add burden to community pharmacists, but in contrary may assist in their work. The drafting of a uniform, comprehensive, systematic law on these services need to be addressed after identifying public's perceptions, and who could benefit most.^{43,44}

In this study, older patients and those with chronic diseases tend to use the service of home delivery medications more. Moreover, those with chronic diseases have better perception towards the service for certain aspects compared to those without chronic diseases. It was reported that home delivery of medication was the main elected root by patients with chronic illnesses such as cardiac, nephrological, and endocrinological disorders to ensure their easy accessibility to their vigorous and continuous drug regimens¹⁰. Moreover, evidence from the literature suggests that more research is required to identify potential candidates for intensive patient care services and telepharmacy. A review of 24 randomized controlled trials assessing multimedia-based medication counseling indicated that this type of service was at least equivalent to other forms of counseling, such as written and face-to-face patient counseling⁴⁵. Furthermore, recent evidence has proposed that individualized video technology consultation with teach-back questions in anticoagulation counseling, such as warfarin which is considered a complex medication, provided similar patient comprehension as standard pharmacists delivered education⁴⁶. It is worth emphasizing that insufficient warfarin education has been shown to be a predictor factor for bleeding complications in patients receiving this inadequate service⁴⁶. Yet, still many previous studies on multimedia patient education intervention on critical chronic medications were inconclusive.^{47,48} There is a need for randomized clinical trials to investigate remote counseling further and measure its outcomes, in mainly the most beneficiary groups, particularly in vulnerable elderly patients with multiple medical comorbidities. Previous studies primarily focused on drug counseling and not on the whole picture of patient condition and vulnerability that may affect the health-related outcomes.^{46,49,50}

It is worth mentioning that the execution of home drug delivery in Jordan is yet traditional. It is implemented at the individual level of the community pharmacies, with limited available resources. Moreover, the medications are delivered to patients at additional costs to cover the expenses of the delivery services. Furthermore, the community pharmacies in

Jordan do not have access to the patients' medical records and their appropriate home medications, which indeed confines the pharmacists to review and assess the appropriateness of the prescribed medications, thus, hinders optimizing the pharmaceutical care services and increasing the risk of medication errors. Therefore, it is recommended to launch a coordinated, systematic platform for delivering home medications, which connects the prescribing physicians, community pharmacists, and patients.

While this study was proactive in investigating the Jordanian public's perception of the delivery of home medications, several limitations must be pointed out. First, this study has recruited a convenience sample of participants via social media, introducing selection bias. This was represented by the low participation of the elderly and those having chronic medical comorbidities. Second, this service is not yet legalized by the national health authorities, limiting its practice and the awareness of the public. Third, the nature of this study may also lead to social desirability bias that might not reflect the participants' actual perception.

Conclusion

In conclusion, this study has shown that most participants showed a positive perception of the home delivery of medication services provided by the community pharmacies compared to in-store drug refills. However, participants believed that this service may decrease pharmacist's patient contact time, thus affecting the quality of medication counseling. Noting that, this service is not yet fully implemented and lack full clear guidelines from health authorities; thus, a future study is required to assess the feasibility of establishing a systematic platform and a national program for home delivery of medications and to examine the expenses of such service and its associated drawbacks.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that there is no conflicts of interest.

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