



Pharmacy Practice

ISSN: 1885-642X

journal@pharmacypractice.org

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Farmacéuticas

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Penang, Malaysia

Pharmacy Practice, vol. 8, núm. 2, abril-junio, 2010, pp. 116-121

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Original Research

Willingness to pay for a pharmacist's dispensing service: a cross-sectional pilot study in the state of Penang, Malaysia

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Received (first version): 21-Oct-2009

Accepted: 25-Mar-2010

ABSTRACT*

Objective: The aim of this pilot study was to assess the value of the dispensing service of pharmacists from the general public's perspective using the contingent valuation technique in the State of Penang, Malaysia.

Methods: Participants were conveniently sampled from malls and were given a self-completed questionnaire that collected the patient's demographic information and their knowledge about the pharmacist's dispensing service. They were then presented with a description of the pharmacist's dispensing service, the risk of medication errors in prescriptions and their consequences, and the risk reduction of medication errors associated with pharmacist intervention. The willingness to pay (WTP) of the participants was later assessed using a contingent valuation interview that asked the likelihood and maximum amount they were willing to pay.

Results: In the study, 100 people participated, and 57% were aged between 18 and 35 years. Of these participants, 51% were women, and 46% of them earned more than 1000 MYR (285.71USD) per month. In addition, 8% of the participants had never visited a community pharmacy. Finally, 67% of the participants were willing to pay for the pharmacists' dispensing service, and the median amount that the participants were willing to pay was 10 MYR (2.86USD). The WTP amount was moderately correlated with their knowledge of the community pharmacist's dispensing services ($r=0.377$, $p=0.02$). **Conclusion:** Generally, the public valued the pharmacist's dispensing service. Their acceptance can be further improved by educating the public on the role of the pharmacist.

Keywords: Fees, Pharmaceutical. Community Pharmacy Services. Malaysia.

VOLUNTAD DE PAGAR POR UN SERVICIO DE DISPENSACIÓN FARMACÉUTICA: ESTUDIO PILOTO TRANSVERSAL EN EL ESTADO DE PENANG, MALASIA

RESUMEN

Objetivo: El objetivo de este estudio piloto fue evaluar el valor del servicio de dispensación de los fármacos desde la perspectiva del público general utilizando la técnica de evaluación del contingente en el estado de Penang, Malasia.

Métodos: Se muestreó convenientemente a los participantes en los centros comerciales y se les dio un cuestionario de auto-cumplimentación que recogía información demográfica del paciente y sus conocimientos del servicio de dispensación de los fármacos. Se les presentaba una descripción del servicio de dispensación farmacéutica, el riesgo de os errores de medicación y sus consecuencias, y la reducción del riesgo de errores de medicación asociada con la intervención del farmacéutico. La voluntad de pagar (VDP) de los participantes se evaluaba después utilizando una entrevista de evaluación del contingente que preguntaba la probabilidad y la cantidad máxima que estaban dispuestos a pagar.

Resultados: 100 personas participaron en el estudio y el 57% estaban entre 18 y 35 años. De estos participantes, el 51% eran mujeres y el 46% de ellos ganaba más de 1000MYR (285,71USD) al mes. Además, el 8% de los participantes nunca había visitado una farmacia comunitaria. Finalmente, el 67% de los participantes estaba dispuesto a pagar por el servicio de dispensación farmacéutica; y la mediana que los participantes estaban dispuestos a pagar era de 10MYR (2,86USD). La VDP estaba ligeramente correlacionada con su conocimiento de los servicios de dispensación farmacéutica ($r=0,377$, $p=0,02$). **Conclusión:** En general, el público valorizó el servicio de dispensación farmacéutica. Su aceptación puede mejorarse educando al público sobre el papel del farmacéutico.

Palabras clave: Tasas farmacéuticas,. Servicios de farmacia comunitaria. Malasia.

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INTRODUCTION

Dispensing medicine is one of the traditional roles undertaken by pharmacists and continues to be one

of their core businesses.¹ Over the years, the dispensing role has been not only limited to the provision of the prescribed medicine to the consumer, but also to ensure that any medicine-related problem in the prescription is rectified beforehand with proper documentation of the process.² For centuries, this dispensing role has been well distinguished from the prescribing role in developed countries, where dispensing is the exclusive right of the pharmacists, while physicians retain their prescribing role. Although the original separation intention was not based purely on public health perspective, the fact that this separation can promote a rational utilisation of medicine, reduce medication errors, and minimise ethical conflicts of physicians as prescribers and suppliers have prompted several other countries to separate these roles accordingly.³

However, in some countries such as Malaysia, the physician is still allowed to assume the role of dispensing due to the historical shortage of pharmacists. There has now been a significant increase (6397 pharmacists in 2008) in the pharmacist workforce since the country's independence 52 years ago, with 500 pharmacists expected to graduate annually from the country's 14 schools of pharmacy.⁴ Despite this increase, there remains substantial government reluctance to change the physicians' role due to the perceived negative public benefit.⁵

Overview of Malaysia Health Care System

Health care in Malaysia is provided by both public and private sectors. The public sector health care is heavily funded by the government, and the patient's co-payment only covers 3% of the cost of providing the service. However, due to its accessibility and convenience, there is an increasing demand for private health care, especially in the primary care sector, with more than 50% of the primary care contact occurring in the private sector. In addition, 93% of private payments in Malaysia are paid out-of-pocket, which is more than double the level found in high income countries.⁶ In Malaysia, all physicians in private practice are allowed to dispense medicine. Physicians dispense most of their prescriptions, and patients cannot choose to have their medications dispensed elsewhere.

Rationale of the Study

In most countries that have separated prescribing and dispensing, the dispensing service fee is set as a percentage mark-up system or a fee for service, which is based on government negotiation or previous utilisation rates.⁷ Although this fee can be used as a proxy for the value of the dispensing service, it does not reflect the real value or the preference of the society for the service. In light of this concern about the value of such dispensing services and the public health importance of such information, an empirical study to assess the value of the pharmacists' dispensing service from the general public's perspective is urgently needed.

A number of studies were published previously that assess the willingness to pay (WTP) for pharmacy service. It has been found that 36 – 85% of the

public are willing to pay for the type of pharmacy service in question.^{8,9} The amount that the public are willing to pay ranged from 4.02 USD for pharmacy service that reduced medication-related problems⁹ to 40 USD for pharmacist-provided menopause and hormone replacement therapy consultations.⁹ In this WTP or contingent valuation method, the respondents were asked to think about the contingency for a program and reveal the maximum amount they would be willing to pay for such a program.¹⁰ However, most of the studies only evaluated a specific or expanded pharmacy service rather than the basic dispensing service. In addition, these studies were based in countries where the pharmacist dispensing role is separated and well established.

Therefore, this preliminary study aims to assess the WTP for pharmacists' dispensing service among the general population in the state of Penang, Malaysia. This information can be used as a direct measure of the monetary value for dispensing through pharmacist. It can be used from normative perspective in a cost-benefit analysis that would inform policy makers about the social desirability of dispensing by pharmacist as compared to dispensing by doctors.¹¹ This could serve as a potential framework to those undertaking a similar task in countries that are still in the process of separating the prescribing and dispensing roles. This information can also be used to construct demand curve in a behavioural perspective (market research).

METHODS

Study Design

A cross-sectional pilot survey on the general population's WTP for pharmacy dispensing service was designed and targeted for the population in the state of Penang, one of the 14 states in Malaysia. For the purpose of this pilot study, the convenience sampling technique was used to recruit only Malaysian adults from various strategic locations in five main shopping complexes in May 2008. Out of 126 potential participants approached, only 100 agreed to participate in this study.

In order to calculate an appropriate initial bidding amount for pharmacy dispensing, the survey was preceded by a cross-sectional micro-costing analysis of ten conveniently sampled community pharmacies in Penang.

Cost Analysis of the Dispensing Cost

A 17-item self-administered questionnaire was developed to assess the resources used for the cost analysis of the dispensing activities. The questionnaire was divided into three sections: information about the pharmacists, the non-pharmacist staff, and the pharmacy. The questionnaires were completed by the person in charge of the community pharmacy, which could be either the pharmacist or manager of the pharmacy.

The cost analysis was performed to calculate the dispensing cost per minute in a community pharmacy. This was calculated as the sum of the

monthly pharmacist cost, the pharmacy overhead cost, and the equipment cost, divided by the pharmacy monthly open hours. The resources included were the pharmacist's salary, the size of the dispensing area, the non-pharmacist staff's salary, rent, electricity, water, phone, security, insurance, furniture, and computer system.

The exact time of the furniture investment, computer system, and security installation for the different pharmacies was unknown. Thus, an assumption was made where all of these items were purchased or installed at the same time. It was calculated as an equivalent cost with a 4.45 annuity factor with the assumption that the items had been in use for five years and had 4% annual depreciation.¹⁰

The dispensing cost per minute was then multiplied with the dispensing time per prescription, which was estimated by the pharmacists to be 15 minutes per prescription.

Instrument Assessing WTP

The willingness to pay for dispensing service was assessed using a 13-item questionnaire, which was prepared in both Malay (Malaysia national language) and English based on past literature and group discussion. The questionnaire was later assessed for its face and content validity by two pharmacy practice experts. The three-part questionnaire was divided into Section A, which collected patient demographic information (gender, age, income, education, and occupation); Section B, which assessed the public's knowledge about the pharmacist's dispensing service (frequency of pharmacy visits, experience in filling prescriptions in the pharmacy, awareness of the six specific activities of pharmacist dispensing); and Section C, which used contingent valuation interviews to assess the ex-post WTP for a pharmacist's dispensing service among the general population. In section B, the public's knowledge was assessed by asking the participants to select the activities that they think are involved in pharmacist's prescription dispensing role.

The contingent valuation (CV) method in section C was performed using a bidding game approach administered by face-to-face interviews with the participants. The participants were presented with a description of the pharmacist's dispensing service, the risk of medication error in prescriptions and its consequences, and the risk reduction of medication error associated with pharmacist intervention¹² (Table 1). They were then asked a series of questions regarding the likelihood for them to pay for the pharmacist's dispensing service and the maximum amount they were willing to pay.¹⁰

Based on the initial dispensing cost analysis, the bidding began with an initial value of 10MYR (2.86USD; 1MYR=0.35 USD). If the participant agreed to pay for the value, the amount willing to pay was increased by 2MYR (0.57USD) to 12MYR (3.43USD). An increment of 2MYR (0.57USD) was added to the last bidding value each time the participant agreed to the suggested amount, until the bidding reached an amount they were not willing to pay for or until the bidding reached the maximum

of 30MYR (8.57USD). If the participant was still willing to pay for the maximum value of 30MYR (8.57USD), an open-ended question was given that asked the maximum amount the participant is willing to pay for the pharmacists' dispensing service.

However, if the participant refused to pay the initial bidding amount of 10MYR (2.86USD), a reduction of 2MYR (0.57USD) was offered every time the participant refused to pay for the service. The bidding amount was reduced until an agreeable amount was reached.

Analysis

All analysis was done using STATA 9.1. The outcome variables were the dispensing cost, willingness to pay, and amount willing to pay for the community pharmacists' dispensing service. Cost was only analysed descriptively. The participant's knowledge of pharmacist dispensing was calculated as the percentage of the activities that the customer selected from the list of activities outlined in Section B. The Chi-square and Fisher's exact test were used to assess the factors associated with the participants' WTP. The Mann-Whitney U, Kruskal-Wallis, and Spearman correlation tests were used to assess the factors associated with the amount the participants' were willing to pay for the pharmacists' dispensing service. For all statistical tests performed, the significance level was set a priori at $P < 0.05$.

Table 1. Description of the nature and benefit of the pharmacists' dispensing service.

Assume that you are taking your prescription to a pharmacy for filling. At first, the pharmacist will screen your prescription to identify any potential medication errors, including incorrect medicine usage or possibility of the medicine in the prescription interacting with your condition or other medicine you are taking. Research has found that three out of ten prescriptions have medication errors. It is important to identify and solve these problems because they will lead to adverse reactions, such as rash, diarrhoea or reduced effectiveness of the medicine. Other research by the Food and Drug Administration (FDA) found that there is at least one death per day and 1.3 million people are injured each year due to medication errors, including wrong medicine and improper dose. Here, the role of the pharmacist is to assist you in the prevention of the undesired outcomes by correcting any medication errors through professional screening, counselling and evaluation. The Jonna Briggs Institute in Australia has found that community pharmacists can reduce the risk of medication errors by 20%.

RESULTS

Dispensing Cost Analysis

For this study, 15 pharmacies were approached, and 10 agreed to participate in the study. In this study, nine (90%) of the participating pharmacies held a retail license, while the remaining pharmacy was a retail and wholesale license holder. There were only three pharmacies that had a personal office for the pharmacists. Six of the pharmacists graduated from a local public university, two graduated from a private local university, and the rest graduated from universities based overseas.

Of the total pharmacy dispensing cost, 38.1% was attributed to the pharmacist's salary, followed by rental costs, which was 24.9%, and then the non-pharmacist staff's salary, which was 23.3%. The mean dispensing cost per minute was estimated to be 0.39 MYR (SD=0.08MYR). The minimum cost per minute was 0.31 MYR (0.09USD) with a maximum of 0.47 MYR (0.13USD). Assuming that the dispensing time was 15 minutes, the dispensing cost per prescription was estimated to be 5.87 MYR (1.68USD). The starting bid for the willingness to pay study was later calculated based on the conservative 40% mark-up of a 15-minute prescription.

Willingness to Pay for a Pharmacist's Dispensing Service

A total of 100 Penangites participated in this study with a mean survey completion time of 6.5 minutes (SD=1.2). Of the participants, 51% were women, and 57% were aged between 18 and 35 years old. A household income of more than 1,000 MYR (285.71USD) per month was reported by 46% of the participants. Most of the participants (54%) were educated to the tertiary education level, and 31% of the participants were unemployed. In addition, 8% of the participants had never visited a community pharmacy. Only 18% of the participants had more than 67% knowledge about the pharmacist's dispensing activities. Concerning the dispensing activities, 34 participants knew that the pharmacists validate prescriptions, 32 participants knew that pharmacists check prescriptions for interactions, 42 participants knew that pharmacists solve medicine-related problems, 52 participants knew that pharmacists provide counselling, 16 participants knew that pharmacists document the dispensing activity, and 22 participants knew that pharmacists do drug monitoring as part of their dispensing role.

When asked about their willingness to pay, 67% of the participants were willing to pay for the pharmacists' dispensing service. Their willingness to pay for the service was found to be similar across gender, age, and education level (Table 2). However, the willingness to pay was found to be significantly different between different income groups ($p<0.05$).

The median (IQR) amount that the participants were willing to pay for a community pharmacist's dispensing service was 10 MYR (8 MYR, 16 MYR). No statistically significant association was found between the participants' demographic factors and the amount they were willing to pay (Table 3). The Spearman correlation test showed that participants' WTP amount for the pharmacist's dispensing service was moderately correlated with their knowledge of the community pharmacist's dispensing services ($r=0.377$, $p=0.02$).

DISCUSSION

This pilot study was carried out to measure the amount the Malaysian public was WTP for a pharmacist's dispensing service. To the best of our knowledge, this is the first study that has pursued such a research question in a non-separated prescribing/dispensing practice.

Of the participants, 67% were willing to pay for the pharmacists' dispensing service. In comparison, the percent of people that are willing to pay for a pharmacist's service in the literature ranges from 36–85%.^{8,9} The high percent found here is impressive considering the largely negative media coverage on the dispensing separation proposal in Malaysia, and this suggests that the Malaysian public do appreciate the benefit of the pharmacists' dispensing service. Furthermore, the Malaysian consumer group association¹³ has publicly thrown

Table 2. Factors associated with the participants' willingness to pay, N=100.

Variable	n (%)		Total	P
	Not Willing to pay	Willing to pay		
Income				
1. No income	16 (41.0)	23 (59.0)	39	0.037 ^a
2. < MYR1000	3 (16.7)	15 (83.3)	18	
3. MYR1000-1999	11 (47.8)	12 (52.2)	23	
4. > MYR2000	3 (15.0)	17 (85.0)	20	
Ethnicity				
1. Malay	13 (31.7)	28 (68.3)	41	0.922 ^b
2. Chinese	13 (32.5)	27 (67.5)	40	
3. Indian	7 (36.8)	12 (68.2)	19	
Education				
1. No formal education	1 (100.0)	-	1	0.286 ^a
2. Primary education	2 (25.0)	6 (75.0)	8	
3. Secondary education	15 (40.5)	22 (59.5)	37	
4. Tertiary education	15 (27.8)	39 (72.2)	54	
Occupation				
1. High and medium level non-manual worker	-	8 (100.0)	8	0.131 ^a
2. Low level non-manual worker	5 (38.5)	8 (61.5)	13	
3. Manual worker	15 (31.3)	33 (68.8)	48	
4. Unemployed	13 (41.9)	18 (58.1)	31	
Age				
1. 18 - 35	16 (28.1)	41 (71.9)	57	0.370 ^b
2. 36 - 50	10 (35.7)	18 (64.3)	28	
3. > 50	7 (46.7)	8 (53.3)	15	

a = Fisher's exact test, b = Chi-square test

its support behind the proposal, and this study finding may be a reflection of public sentiment.

This study found that neither demographic factors (except income) nor knowledge about the pharmacists' activities were associated with the participants' willingness to pay. One possible explanation for this observation is that the Malaysian public may not feel comfortable paying out-of-pocket for health services that are usually free or included in the physician's fee; however, this was not explored in the present study. The mechanism of payment for dispensing the service was not stated in the survey, and this may have influenced the participants' negative decision, not because they do not value the service, but because they feel that their insurance should cover it.^{8,10} Thus, to reduce this strategic bias, future research should include a description of the payment mechanism and perhaps form the question using an ex ante approach that would frame the outcome in an uncertain term.

This study found that the societal value of the pharmacist's dispensing service was 10 MYR (2.86USD), which is considerably enough to cover the cost of providing such a service. This is a reasonable amount, especially considering that it is also far lower than the average Malaysian physician's consultation fee (which is 30 MYR). However, caution should be taken as the estimated value could be the result of starting point bias, which is the bias introduced by the first bid into the monetary valuation.¹⁴ Although this study does not analyse the effect of this bias, the value found coincides with the first bid given to the participants.

No demographic factors were found to be associated with the amount the participants were willing to pay, despite evidence of age association by Suh.⁸ However, evidence about the age association with the amount people are willing to pay for a health service is very inconsistent, with some studies pointing to a similar finding with the present study.¹⁵ Some studies have found a significant relationship between income and the amount people are willing to pay.^{9,16} However, this was not found in our study, similar to a few other

Variable	n (%)	Willing to pay (MYR)			P
		Min	Max	Mean (SD, Med)	
Gender					
1. Male	36 (53.7)	4	50	13.06 (7.95, 10)	0.759 ^a
2. Female	31 (46.3)	2	30	12.97 (8.14, 10)	
Ethnicity					
1. Malay	28 (41.8)	6	22	12.57 (4.21, 10)	0.553 ^b
2. Chinese	27 (40.3)	2	50	14.15 (10.94, 10)	
3. Indian	12 (17.9)	4	30	11.50 (7.04, 10)	
Age					
1. 18-35	41 (61.3)	2	30	12.20 (6.35, 10)	0.099 ^b
2. 36-50	18 (26.9)	4	30	11.89 (7.21, 10)	
3. > 50	8 (11.9)	4	50	19.75 (13.58, 17)	
Education					
1. No formal education	-	-	-	-	0.178 ^b
2. Primary education	6 (9.0)	4	24	11.00 (7.55, 9)	
3. Secondary education	22 (32.8)	4	30	15.36 (9.33, 14)	
4. Tertiary education	39 (58.2)	2	50	12.00 (7.09, 10)	
Occupation					
1. High and medium level non-manual worker	8 (11.9)	4	30	17.00 (10.14, 17)	0.139 ^b
2. Low level non-manual worker	8 (11.9)	8	18	11.25 (3.69, 10)	
3. Manual worker	33 (49.3)	2	30	13.27 (6.36, 12)	
4. Unemployed	18 (26.9)	2	50	11.56 (10.57, 10)	
Income					
1. No income	23 (34.3)	2	30	10.87 (5.68, 10)	0.172 ^b
2. < MYR1000	15 (22.4)	2	50	15.33(12.16, 12)	
3. MYR1000-1999	12 (17.9)	4	16	10.67 (3.75, 10)	
4. > MYR2000	17 (25.4)	4	30	15.53 (7.53, 16)	
First Illness Reference					
1. Doctor	29 (43.28)	2	30	14.07 (6.79, 12)	0.954 ^b
2. Pharmacist	25 (37.31))	2	30	10.64 (5.56, 10)	
3. Family members	8 (11.94)	4	30	13.75 (8.78, 10)	
4. Friends	3 (4.48)	8	50	22.67 (23.69, 10)	
5. Others	2 (2.99)	6	14	10.00 (5.66, 10)	
Pharmacy visit					
1. Never	23 (34.33))	2	50	13.39 (9.99, 10)	0.301 ^b
2. 1-3	34 (50.75)	4	30	12.24 (6.34, 10)	
3. 4-6	7 (10.45)	2	24	12.29 (7.34, 12)	
4. >6	3 (4.48)	14	30	20.67 (8.33, 18)	
Physician visit					
1. Never	12 (17.91)	6	20	10.33 (2.81, 10)	0.493 ^b
2. 1-3	35 (52.23)	4	30	12.86 (6.46, 10)	
3. 4-6	14 (20.90)	2	30	13.00 (9.15, 10)	
4. >6	6 (8.96)	4	50	19.33 (15.98, 17)	

a = Mann-Whitney, b = Kruskal-Wallis

studies.^{8,17} We believe these findings may be caused by the negligible amount in the questions as compared to other professional service charges in this country. However, this study also found that the more knowledgeable the consumers were about the pharmacist's dispensing service, the higher amounts they were willing to pay for the service. Once the consumers have more knowledge of the pharmacist's dispensing service, they will have better insight about the role that the pharmacists play in providing the service, which results in a higher value for the service.

One of the limitations of this study is that the small convenience sample that was used limits its generalisation to the whole Malaysian population. The Penang state itself is generally an urbanised and high income state, which might not reflect the other Malaysia states that have higher rural and lower income populations.

In addition, the fact that individuals indicated that they would be willing to pay a certain amount does not mean that they would actually do so in a real-life situation. However, validation with real-life data is difficult to perform, though a variable starting amount could be used in future research to reduce this bias.

CONCLUSIONS

This study suggests that the general public values the pharmacist's dispensing service. Although no demographic factors influenced this decision, the public understanding of the pharmacist's dispensing services was found to positively influence the amount they are willing to pay. Therefore, there is a need for an intensive education campaign to be carried out to educate the general public about the pharmacist's role in the dispensing service in order to improve the acceptance of such a change among the general public.

ACKNOWLEDGEMENT

The authors would like to thank the following students of Universiti Sains Malaysia' Bachelor of Pharmacy program: Lee Jia Yin, Liew Mei Fun, Lim Mei Ling, Lim Say Hoon, Lim Swee Chin, Mohd Izzat Mohd Husain, Mohd Izaat Salleh@Ali, Mohd Khairul Faizan Zakaria, Mohd Khairul Azman, and Ng Woan Lee for their assistance in this pilot study. We also appreciate the service of American Journal Experts for their comments and editing of the final manuscript.

CONFLICT OF INTEREST

None declared.

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