Faktor yang Mempengaruhi Pelaksanaan Pelayanan Kefarmasian oleh Apoteker Komunitas di Kabupaten Banyumas Dengan Metode *Discrete Choice Experiment*

Factors Affecting Pharmaceutical Care Implementation by Community Pharmacist: a Discrete Choice

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ABSTRACT

Even though pharmaceutical care has been proven increasing patients' quality of life, pharmacists still have barriers to implement it. Our study aims to examine factors affecting pharmacists in the community to implement pharmaceutical care using a *Discrete Choice Experiment* (DCE). The study was a cross-sectional study. A structured DCE questionnaire was administered to 90 community pharmacists in Banyumas district, Indonesia. Respondents were chosen using a simple random sampling method. According to the literature review and expert opinions, the following six attributes were selected: pharmacists' confidence; willingness to implement pharmaceutical care; communication skill; knowledge and professional skill; availability of time; and availability of space in pharmacy. Eighteen choice sets were developed. Each choice sets comprised of two scenarios. Respondents were asked to choose the scenario they preferred the most. Data were analyzed using multinomial logit model. Of 90 questionnaires distributed, 67 were analyzed. Based on multinomial logit, all attributes had a significant effect on pharmacists' preferences to implement pharmaceutical care. The findings suggested that pharmacist association should train their member to increase professional skills, as well as the management of pharmacy should provide enough space to perform pharmaceutical care.
Keywords: pharmaceutical care, community pharmacist, Banyumas district, discrete choice experiment

INTRODUCTION

The pharmaceutical service paradigm has undergone a shift from initially focusing on drug management (drug-oriented) to a service focused on increasing patients' quality of life (patient-oriented). In accordance with the mandate of Government Regulation Republic of Indonesia No. 51 of 2009 about pharmaceutical work, pharmaceutical work is manufacturing, including the quality control of pharmaceutical preparations, safeguards, procurement, storage, and distribution of drugs, management of prescription drugs, drug information services, also development of drugs, material of drugs, and traditional medicine[1]. Pharmaceutical work or pharmaceutical services performed by pharmacists, which includes management of pharmaceuticals and clinical pharmacy services[2]. Clinical pharmacy services include a screening of prescription, dispensing, drug information services, counseling, home pharmacy care, drug therapy monitoring, and monitoring of side effects of drugs.

The clinical pharmacy services performed at the pharmacy are in line with the concept of pharmaceutical care or comprehensive pharmaceutical services aimed at improving patients' quality of life[3]. Several studies have shown that pharmaceutical care performed at pharmacies can provide benefits to asthma patients, including improvement of the quality of life, treatment efficacy, peak expiratory flow, and improvement in inhalation techniques[4–6]. Pharmaceutical care also provides benefits for improving the quality of life of patients with headaches or migraines[7], in patients with hypertension[8], and in elderly patients[9].

Previous studies have shown that the pharmacist's willingness to perform pharmaceutical care is quite high (76%-99%)[10–12]. However, pharmacists have some barriers in the delivery of pharmaceutical care, i.e., lack of experience, knowledge and professional abilities[12-14], lack of awards regarding money[13–15], lack of time[10,13,15–17], and lack of support from other peers or professional organizations[16–19].

Characteristics of pharmacies located in Banyumas district are very supportive of pharmacists in performing pharmaceutical care, where 50% of pharmacies are self-managed by pharmacists with the attendance rate of pharmacists in pharmacies is quite high at around 73%[20]. Pharmacists in Banyumas district also have a desire to spend more time doing professional works than non-professional works in pharmacies[21]. However, the factors and barriers affecting community pharmacists in Banyumas district in performing pharmaceutical services are not yet known.

The *Discrete Choice Experiment (*DCE) method to be used in this research is a fairly new and not widely used method in Indonesia, where it has the advantage of providing information on the relative importance of different factors in the health services and trade-offs between these factors[22,23]. It is very useful to determine the most influential factors on pharmaceutical care implementation in pharmacies and pharmacist barriers in performing pharmaceutical care, to perform remedial measures, so it is expected to improve the service that can ultimately improve the quality of life of patients.

METHODS

The design of this study was a cross-sectional survey, using a *Discrete choice experiment* method. The location was in community pharmacies located in Banyumas district, Central Java Province, Indonesia. The population in this study was all pharmacists who practice in community pharmacies in Banyumas district, 212 pharmacists (data per April 2016). While the sample in this study was selected based on the inclusion criteria, as follows: a pharmacist who practiced in community pharmacies in Banyumas district, has a Registration Letter of Pharmacist (STRA) and pharmacist practice license (SIPA), can be as pharmacist-manager of pharmacy (APA) or as a pharmacist companion (APING), and has been practiced in pharmacy at leas t 1 year.

The sampling method was simple random sampling, where all pharmacists have the same opportunity to be chosen as a respondent. We chose respondents by giving a serial number then randomly drawing it to meet the minimum number of samples.

The number of samples in DCE study should not be too large, which can deplete time, resources, and money; Also, should not be too small (less than 30 people) that may lead to inaccurate results[24]. A previous study suggests that, for DCE studies, 20-30 respondents were able to provide accurate parameter estimates[25]. In our study, due to feasibility in term of duration and budget, a number of sample sizes were arbitrarily set at 90. All participants in this study have been signed the information and consent form.

The instrument used in this study was a questionnaire. The questionnaire was developed according to the DCE methodology, which consisted of the following steps;

Identifying attributes

The attributes of this study were obtained from extensive literature reviews and focus group discussions (FGDs) with some pharmacists and experts from the Indonesian Pharmacist Association (IAI)[26]. The literature review helped to identify all possible attributes and then used as a guide for discussion with pharmacists and experts.

According to Ryan., *et al* the acceptable number of the attribute is 4-6, beyond that the choice task will get too complex[27]. In this study, based on discussion with the experts, the following six attributes were included: pharmacists' confidence; willingness to implement pharmaceutical care; communication skill; knowledge and professional skill; availability of time; and availability of space in pharmacy.

Assigning levels to the attributes

Literature review and discussion with pharmacist and experts were used to identify the attribute levels (Table I).

Table I. Attributes and assigned attribute levels

No.	Attributes	Levels	Level coding
1.	Pharmacists' confidence (in range 1 – 3, 1=low, 2=medium, 3=high)	(1) 1	0
		(2) 2	1
		(3) 3	2
2.	Willingness to implement pharmaceutical care (in range 1 – 3, 1=low, 2=medium, 3=high)	(1) 1	0
		(2) 2	1
		(3) 3	2
3.	Communication skill (in range 1 – 3, 1=low, 2=medium, 3=high)	(1) 1	0
		(2) 2	1
		(3) 3	2
4.	Knowledge and professional skill (in range 1 – 3, 1=low, 2=medium, 3=high)	(1) 1	0
		(2) 2	1
		(3) 3	2
5.	Availability of time	(1) Less available	0
		(2) Rather available	1
		(3) Available	2
6.	Availability of space in pharmacy	(1) No	0
		(2) Yes	1

Table II. Example of a DCE choice set as presented in the questionnaire

Question 1		
Characteristics	Pharmaceutical care A	Pharmaceutical care B
Pharmacists' confidence (in range 1 – 3, 1=low, 2=medium, 3=high)	Low	Low
Willingness to implement pharmaceutical care (in range 1 – 3, 1=low, 2=medium, 3=high)	Low	Low
Communication skill (in range 1 – 3, 1=low, 2=medium, 3=high)	Low	High
Knowledge and professional skill (in range 1 – 3, 1=low, 2=medium, 3=high)	Low	High
Availability of time	Less available	Rather available
Availability of space in pharmacy	No	Yes
From the above characteristics, in which condition you would like to implement pharmaceutical care to a patient?	☐	☐

Development of questionnaire

The scenario of the questionnaire in this study was developed using fractional factorial design. It was based on the catalogue that has been constructed to facilitate construction of experimental plans[28]. The catalogue consists of two parts, i.e., an index and a set of master plans. The index is a listing and description of the experimental plans, while the master plans give specific combinations of variables for each experimental trial for the plans. There were 6 attributes in this study, consisted of 5 attributes with three levels and 1 attribute with two levels. According to the index of the catalogue, the number of choice sets was 18. The index also showed the number of master plans and a number of columns used in the master plan. We used master plan number 6.

Random pairing method was used to pair levels in all attributes (Table II). Demographic data form respondents were also examined in the questionnaire, including age, gender, work experience in year, year of graduation, university graduate, and training ever followed. The DCE questionnaire was self-administered and presented in Bahasa Indonesia.

Data collection and data analysis

Pilot testing on the DCE questionnaire was conducted with 10 non-respondent pharmacists. The purpose of the pilot testing was to ensure understanding, clarity, and appropriateness of the questionnaire before the data collection begins. During the data collection process, questionnaires then were administered to the respondents.

Demographic data were entered into SPSS program. Descriptive data were analyzed using frequencies test. DCE data were transferred to STATA program and analyzed using multinomial logit (MNL) model regression analysis[29]. Regression coefficients were calculated for all attributes in the regression model. The results then were compared to the reference level. The magnitude of the regression coefficient represented the degree of preference for each attribute, the bigger the coefficient, the more preferred the attribute. The significance level was set at p-value < 0.05. The MNL model was calculated by the following formula[30]:

$U_{isj} = \beta_1$ confident $+ \beta_2$ willingness $+ \beta_3$ communication $+ \beta_4$ knowledge $+ \beta_5$ time $+ \beta_6$ space $+ \varepsilon_{isj}$ .... (1)

Where i is the individual index, j is the index for the alternative, s is the number of the choice set, U is the utility, β is the observed variable coefficient, and ε is the error term.
Confident = pharmacists' confidence; Willingness = willingness to implement; pharmaceutical care; Communication = communication skill of pharmacist; Knowledge = knowledge and professional skill of pharmacist; Time = availability of time of pharmacists; Space = availability of space in the pharmacy.

RESULTS AND DISCUSSIONS
Characteristics of respondents

Of the 90 randomly selected respondents, 69 respondents completed the questionnaire, while the other 21 refused to participate or have been changed their practice address. Of the 69 respondents who have filled out the questionnaires, only 67 respondents completed the answers so that data can be processed (69/90; 74.44% response rate) (Table III).

The average age of respondents was 33.88 years (SD = 9,6), with the most age range 24-40 years (N = 58, 86,6%). It means that most of the pharmacists in pharmacy were still young. Most of the respondents were female (N = 59, 88.1%). Most of the respondents graduated in 2006-2015, 51 respondents (76.1%), and graduated from Universitas Muhammadiyah Purwokerto (N = 38, 56,6%), as it was the only pharmacy university in Purwokerto. It is aligned with the mean age of the respondents. Most of the respondents acted as pharmacist managers of pharmacies (APA) as many as 55 people (82.1%). All respondents have registration letter of a pharmacist (STRA) and pharmacist practice license (SIPA). This data showed that all pharmacists follow the regulation. The average respondent has experience in pharmacy practice for 7.8 years (SD = 8.6), with the most experience range between 0-10 years as many as 55 people (82.1%).

DCE results

Multinomial logit (MNL) model was used to determine the factors that affect pharmacists in performing pharmaceutical care. Table IV shows the results of the MNL model. Reference shows the best case. The significant affecting attribute is the pharmacist's confidence; willingness to conduct pharmaceutical care (in low level); communication skill of pharmacists (in low levels); knowledge and professional skills of pharmacists; availability of pharmacist time; and availability of space at the pharmacy. All coefficients produce a negative effect, indicating that respondents prefer

Table III. Characteristics of respondents

Characteristics	N (%) or Mean (SD)
Age (year)	33.88 (9.6)
≤30	28 (41.8)
31– 40	31 (46.3)
41– 50	3 (4.5)
>50	5 (7.5)
Gender	
Male	17 (25.4)
Female	50 (74.6)
Year of graduation	
≤2000	7 (10.4)
2001-2005	8 (11.9)
2006-2010	30 (44.8)
≥2011	21 (31.3)
Graduated from university	
Universitas Muhammadiyah Purwokerto (UMP)	38 (56.7)
Universitas Gadjah Mada (UGM)	9 (13.4)
Universitas Sanata Dharma (USD)	4 (6.0)
Universitas Surabaya (UBAYA)	3 (4.5)
Universitas Setia Budi (USB)	3 (4.5)
Universitas Ahmad Dahlan (UAD)	2 (3.0)
Universitas Muhammadiyah Surakarta (UMS)	2 (3.0)
Universitas Padjajaran (UNPAD)	2 (3.0)
Institut Teknologi Bandung (ITB)	1 (1.5)
STIFAR YAPHAR Semarang	1 (1.5)
Universitas Airlangga (UNAIR)	1 (1.5)
Status of employment	
Pharmacist manager of pharmacy (APA)	55 (82.1)
Pharmacist companion (APING)	12 (17.9)
Duration of practice in pharmacy (year)	7.8 (8.6)
≤5	32 (47.8)
>5-10	23 (34.3)
>10-20	6 (8.9)
>20	6 (8.9)

the best case or reference.

Based on the results of this study, community pharmacists in Banyumas district prefer to perform pharmaceutical care if their confidence was high. Respondents prefer not to undertake pharmaceutical care if their confidence was low or moderate. This result was in accordance with some previous studies, where the predictor of pharmacist behavior and willingness to perform pharmaceutical care was the ability and skill of pharmacists itself[31]. Unlike the pharmacist's willingness, respondents choose to do pharmaceutical care if their will was high and medium. Respondents prefer not to pharmaceutical if their will was low. This result was consistent with some previous studies in Nigeria, Sudan, and Jordan, where most pharmacists have a high level of attitude and willingness to perform pharmaceutical care[10–12,18].

A low ability of the pharmacist to communicate greatly affects the pharmacist in

Table IV. Result analysis of multinomial logit regression

Attribute	Coefficient (95% CI)	p-value
Pharmacists' confidence (conf)		
Low (conf1)	-1.438 (-1.740, -1.136)	0.000
Medium (conf2)	-.313 (-.623, -.002)	0.048
High (conf3)	Reference	
Willingness to implement pharmaceutical care (will)		
Low (will1)	-2.067 (-2.509, -1.625)	0.000
Medium (will2)	-.277 (-.629, .076)	0.124
High (will3)	Reference	
Communication skill (comm)		
Low (comm1)	-1.116 (-1.622, -.609)	0.000
Medium (comm2)	-.134 (-.566, .297)	0.542
High (comm3)	Reference	
Knowledge and professional skill (know)		
Low (know1)	-2.465 (-2.870, -2.061)	0.000
Medium (know2)	-.427 (-.852, -.001)	0.049
High (know3)	Reference	
Availability of time (time)		
Less (time1)	-1.592 (-1.992, -1.192)	0.000
Rather (time2)	.443 (.080, .806)	0.017
Available (time3)	Reference	
Availability of space in pharmacy (space)		
No (space1)	-1.336 (-1.645, -1.028)	0.000
Yes (space2)	Reference	

performing pharmaceutical care, which prefers not to give it. The ability to communicate by pharmacists, either to patients, doctors, or other health professionals is one of the obstacles to the implementation of pharmaceutical care[12]. In addition, the support and understanding of peers and superiors, as well as difficulties in involving physicians in the delivery of pharmaceutical care[17] is an indication of failure in establishing communication.

A good knowledge, experience, and professional capabilities of pharmacists also influence the pharmacists in providing pharmaceutical care to patients. Studies in Nigeria and Jordan showed that while most pharmacists have a goodwill and attitude in performing pharmaceutical care, they have barriers to improve knowledge, professional skills, and require training to overcome these barriers[11,12]. Barriers to the implementation of pharmaceutical care in terms of the lack of knowledge about treatment, lack of training, and the ability to solve clinical problems are also demonstrated by a study[13] conducted in New Zealand and by a study[14] conducted in Scotland.

In this study, pharmacists in Banyumas district prefer to provide pharmaceutical care when the time is available. This results is consistent with the previous study in Iowa, USA, where pharmacists are keen to perform medication therapy management services but are constrained by lack of time[16]. Another study has shown that the main constraint in pharmaceutical care delivery by pharmacists in Europe is lack of time and money[15].

Respondents in this study chose not to undertake pharmaceutical care if there was not enough space available. The availability of space is also an obstacle for pharmacists in Nigeria in performing pharmaceutical care[11]. Another study showed that more than 50% of pharmacists in New Zealand are constrained

by adequate space to perform pharmaceutical care[13]. This suggests the management of the pharmacy to provide enough space or room to deliver counseling.

In addition to the DCE questionnaires, researchers also gave open-ended questions about other factors that prevent pharmacists from conducting pharmaceutical care, with 45 respondents providing answers. Most respondents stated that the factors of the patients, i.e., the availability of patient time, the patient did not want to be given pharmaceutical care, and the patient felt already know about the drugs consumed. This indicates that the role of pharmacists is still not recognized in the community. Some respondents also stated that the availability of pharmacist time (the long duration of consultation, whereas the patients who came to the pharmacy quite a lot), the availability of places, the knowledge of the drug is less up to date, communication constraints, lack of human resources which discourages pharmacists from performing pharmaceutical care to patients. The respondent's answer to the open-ended question is consistent with the outcome of the DCE. Some respondents still include knowledge, communication, availability of space and time as constraints in providing pharmaceutical care. This suggests that these are the factors that the pharmacist is concerned about.

This study is the first DCE studies to identify factors affecting pharmacists in pharmaceutical care. This study has limitations where generalizations for samples elsewhere may yield different results, where the characteristics of the pharmacist may be different. Secondly, the possibilities of inter-attribute interactions that require further research. Thirdly, the marginal effect to find out how much probability of events changes when predictive needs to be assessed.

CONCLUSION

Community pharmacists in Banyumas district prefer to undertake pharmaceutical care if they have high confidence, moderate and high willingness, moderate and high communication skills, high level of knowledge, experience and professional capability, have enough time, and have space in the pharmacy. The results of this study suggested the pharmacist association to improve the capacity of their members and suggested pharmacy management to provide space for pharmacists to undertake pharmaceutical care.

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