

# Factors affecting community pharmacist's service for women with chronic diseases during pregnancy and breastfeeding: application of the Health Belief Model

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# Factors affecting community pharmacist's service for women with chronic diseases during pregnancy and breastfeeding: application of the Health Belief Model

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## Abstract:

**Background:** Pharmacists are known as health care professionals who are responsible for the safety and efficacy of medicine to achieve optimal therapeutic results. Community pharmacists have an opportunity to provide direct services, including giving an active medication information service in women during pregnancy and breastfeeding. This study aimed to determine the factors associated with the practice of community pharmacists for actively giving the drug information service for women with chronic diseases during pregnancy and breastfeeding based on the Health Belief Model.

**Methods:** About 300 community pharmacists were randomly chosen to participate in the study. All participants were asked to complete questionnaires that were designed based on the theory of the Health Belief Models. The questionnaires measured the community pharmacists' knowledge, beliefs, cues to action, and practice for actively giving medication information services.

**Results:** About 267 pharmacists in the community agreed to participate in this study. Nearly 80% of the participants were female pharmacists (n = 213). The results show that pharmacists' knowledge had significant influences towards perceived threat (p = 0.009), perceived benefit (p = 0.011), and pharmacists' self-efficacy (p < 0.001). The self-efficacy factor was the most influential factor in the practice of pharmacists to give medication information service actively (p < 0.001).

**Conclusions:** The findings of the study indicate that self-efficacy is the most important factor for pharmacist to be able to provide the medication information services successfully particularly in women during pregnancy and breastfeeding. Providing continuous learning programs through seminars and training related to medication use during pregnancy and breastfeeding to pharmacists is needed to optimise the confidence and the ability of pharmacists in providing the services.

**Keywords:** affecting factors, breastfeeding, community pharmacy, medication information service, pregnancy

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## Introduction

The use of drugs during pregnancy and breastfeeding cannot be avoided, especially in pregnant and lactating women with a history of chronic disease. The changes in physiological and hormonal conditions during pregnancy and breastfeeding may cause a problem related to the drug used. The transfer of drug through the placenta during pregnancy can affect the condition of the foetus in pregnant women, while during breastfeeding, several drugs can diffuse into breast milk so that it can affect the health condition of the baby [1]. Based on this condition, the use of drug should always be supervised by health care professionals such as pharmacists. A pharmacist is a health care professional who is responsible for drugs used, medical devices, and other health care services to achieve an optimal therapeutic result for patients. A pharmacist should fulfil the professional criteria, which are being competent, trustworthy, and caring for the patient's condition [2]. One of the pharmacist's responsibilities as a health care professional is to educate patients regarding drug use.

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Drug information services can be categorised as active or passive service. Drug information active service means that the service is provided without waiting for questions from the patient, such as providing booklet/leaflet to be taken freely by patients, whereas drug information passive service means when pharmacists respond to the patient's enquiries about drugs [3]. Active drug information service is one of the pharmacists' commitments as health care professionals to improve patient's quality of life.

According to studies in Surabaya and other regions in Indonesia, it is known that patients' satisfaction about drug information services given in community pharmacies is still low. The majority of patients said that pharmacists were lacking in the ability to provide complete drug information and were not able to maximise the use of brochures and leaflets as sources of information [4], [5], [6], [7], [8]. Additionally, one study [8] reported that 63.10% of pharmacy staffs tend to distribute drug information service passively.

To evaluate the factors that affected pharmacists to provide drug information service actively, we implemented the Health Belief Model (HBM) theoretical approach developed by Rosenstock in 1966. The components of this model emphasise the importance of human perception and include perceived severity, susceptibility, benefits, barriers, and cues to action. The HBM theory explains that demographic profile and knowledge influence a person's perception to act. In addition, the other influencing factor is external factor, namely a cue to actions (Figure 1). The HBM is one of the most commonly used theoretical models in health-related research attempting to explain and predict health behaviour. Since then, the HBM has been adopted to explore a variety of health behaviours. The practice of pharmacists in providing leaflet/brochure as a form of active drug information service is influenced by the level of pharmacists' beliefs in the importance of providing drug information service to pregnant women and breastfeeding mothers with chronic disease. Therefore, this study aimed to determine the factors associated with the practice of community pharmacists for actively giving the drug information service for women with chronic diseases during pregnancy and breastfeeding based on the HBM.

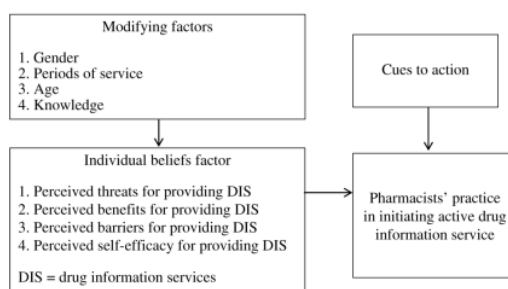


Figure 1: Research concept framework.

## Materials and methods

A cross-sectional study was carried out from February to May 2019 at community pharmacies in Surabaya. The participants were chosen randomly among registered community pharmacists in Surabaya using a simple random sampling method with a computer-generated software Microsoft Excel (Microsoft excel 2010, Redmon, WA, USA). Pharmacists who worked at least 2 h per day in the community pharmacies and agreed to participate in the study were approached. The participant's response rate is described in Figure 2. This study was approved by the Human Research Ethics Committee of the Faculty of Public Health at Universitas Airlangga (no. 56/EA/KEPK/2019).

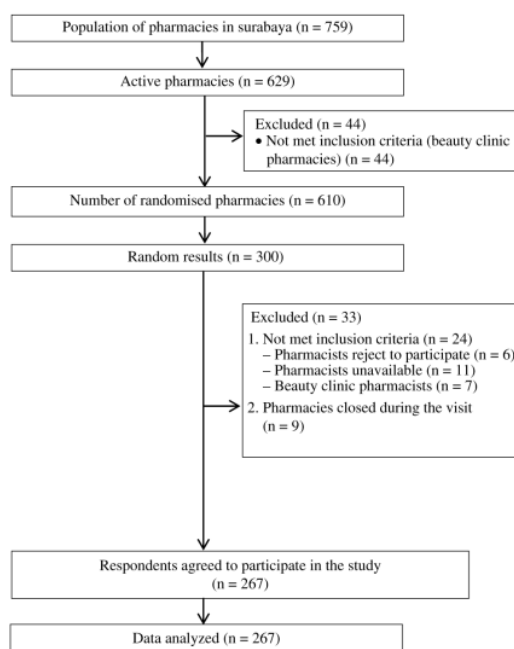


Figure 2: The flowchart of participants' response rate.

Interviews using a questionnaire based on HBM theory designed for this study were performed. A presurvey was implemented before the study, and it proved to be a reliable and accepted instrument. The questionnaire consisted of demographic information (e.g. age, gender, degree of education, and work experience). The questionnaire also consisted about the pharmacist's knowledge, perception, cues to action, and active practice regarding drug information service. The pharmacist's knowledge scores were categorised as true (score = 1) or false (score = 0), whereas questions about perceived threat, perceived benefits, perceived barrier, perceived self-efficacy, cues to action, and active practice regarding drug information service were scored as Likert scale as follows: strongly agree = 5, agree = 4, neutral = 3, disagree = 2, and strongly disagree = 1.

Data were analysed with SPSS version 22.0 (IBM SPSS Statistics for Windows, Armonk, NY, USA). The demographic characteristics of the participants, level of knowledge, perceived beliefs, cues to action, and practice were reported using descriptive statistics (frequencies, proportions, means, and standard deviation). The Kolmogorov-Smirnov test was used to see the normality of data distribution. The bivariate analysis, Mann-Whitney test, and Kruskal-Wallis test were used to determine whether different characteristics showed significantly different factor scores on the HBM scale. A multiple linear regression analysis was used to see the most influence factors between independent and dependent variables.

## Results

### Demographic characteristics

The demographic characteristics of study participants are summarised in Table 1. About 267 community pharmacists agreed to participate in this study. Participants' median age was 30 years, ranging between 28 and 37 years; the majority were female. Only a few of pharmacists (<2%) had a master's degree level. Most of the pharmacists had no experience as participants in seminars or training related to medication used during pregnancy and breastfeeding.

Table 1: Demographic characteristics of pharmacists (n = 267).

Demographic characteristics	n (%)
Age, median (interquartile range), years	30 (28–37)

Gender		
10 male		213 (79.8)
Work experience		
<1 year		10 (3.7)
1–5 years		168 (62.9)
6–10 years		56 (21)
>10 years		33 (12.4)
Education		
Pharmacist		264 (98.9)
Master's degree		3 (1.1)
19 Experience in attending seminars or training related to drug use in pregnant and breastfeeding woman		
0 time		162 (60.7)
1 time		72 (27)
2 times		30 (11.2)
3 times		3 (1.1)
>3 times		0 (0)
Experience in serving pregnant and breastfeeding woman		
Ever		228 (85.4)
Experience in having been pregnant or having a wife who was/has been pregnant		
Yes		118 (44.2)
Experience in breastfeeding or having a wife who is/has ever breastfed		
Yes		91 (34.1)

### Pharmacists' knowledge

The results about pharmacists' knowledge regarding the use of medication for chronic disease during pregnancy and breastfeeding showed that most of the pharmacists had a good knowledge about absorption, distribution, drug metabolism and elimination, safety of drug use, teratogenic effect, and drug information search, but most of them had poor knowledge in regard the aspect of medication used during pregnancy and breastfeeding (Table 2).

**Table 2:** Scores of knowledge, belief, cues to action and practice of active drug information service.

Variables	x	Me	SD
Knowledge	12.42	13.00	1.84
Absorption, distribution, metabolism, elimination of drug	1.61	2.00	0.68
Safety of drug use	3.36	4.00	0.78
Teratogenic effect	1.58	2.00	0.58
Drug use	2.25	2.00	0.69
Information searching	3.61	4.00	0.54
Belief			
2 Perceived threats	16.70	17.00	1.84
Perceived benefits	16.42	16.00	1.85
Perceived barriers	11.20	11.00	1.63
Perceived self-efficacy	15.91	16.00	2.07
Cues to action	17.15	17.00	1.74
Practice	16.26	15.00	2.41
Provision of facilities	6.65	6.00	1.21
Use of facilities	6.22	6.00	0.92
Counselling	3.39	3.00	0.86

Me, median value; SD, Standard deviation; x, average value.

### Pharmacists' belief

The results about pharmacists' belief showed that more than 50% of pharmacists in the community felt that not providing optimal drug information service could be harmful to pregnant and breastfeeding women. Pharmacists had the perception that providing drug information service to pregnant and breastfeeding patients

was beneficial to improve the patient's health condition and quality of life. However, pharmacists felt some barriers to providing drug information. The results show the insufficient self-efficacy in providing active drug information service to pregnant or breastfeeding women was the main barrier (Table 2).

### Cues to action

The results of the cue measurement to act that was felt by pharmacists showed that more than 50% of pharmacists in the community had high cues to action to actively deliver drug information service to pregnant and breastfeeding women with chronic diseases (Figure 3).

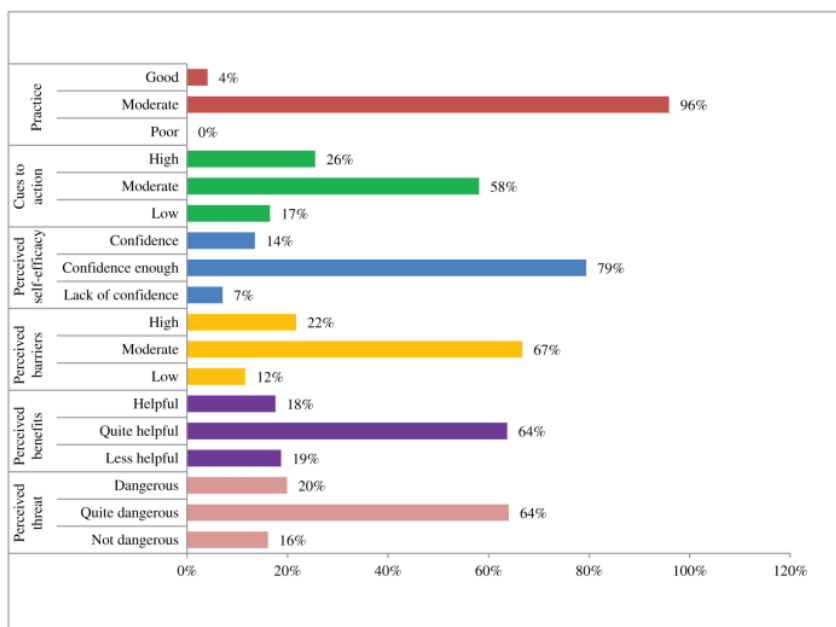


Figure 3: Diagram of beliefs, cues to action, and practice of pharmacists in providing information services.

### The practice for providing active drug information service

In regard to the practice of community pharmacists in providing active drug information service, the results indicated that most of them had inadequate practice to actively provide drug information services for pregnant and breastfeeding women. More than 70% of pharmacists in the community did not provide or did not have drug information service facilities including counselling related to medication used during pregnancy and breastfeeding (Figure 3).

### The effect of modifying factors on pharmacists' belief

The analysis of gender difference on the pharmacists' belief using Mann-Whitney test showed that there was no significant difference between men and women ( $p > 0.005$ ). Similar result was also shown in work experience towards the pharmacist's belief ( $p > 0.005$ ), using Kruskal-Wallis test. The linear regression test showed that age of the respondents did not significantly influence the pharmacists' beliefs (perceived threat, benefits, barriers, and self-efficacy) ( $p > 0.05$ ). However, the result in Table 3 showed that knowledge had significant influence on the pharmacists' beliefs (perceived threat,  $p = 0.009$ ; perceived benefits,  $p = 0.011$ ; and self-efficacy,  $p < 0.001$ ). The pharmacists' knowledge was the only modifying factor that could affect the pharmacists' beliefs. Moreover, other modifying factors such as age, gender, and the duration of work experience did not influence the pharmacists' beliefs in providing drug information services actively to pregnant and breastfeeding women with chronic diseases.



**Table 3:** Result of multiple linear regression analysis of age and knowledge, pharmacist's beliefs, and cues to action towards pharmacist's practice.

Dependent variables	Independent variables	$\beta$	t	p-Value	F	$R^2$
Perceived threat	(Constant)	–	16.510	0.000	3.598	0.027
	Age	0.022	0.364	0.716		
	Knowledge	0.161	2.648	0.009 <sup>a</sup>		
Perceived benefits	Constant	–	16.202	0.000	3.400	0.025
	Age	0.022	0.363	0.717		
	Knowledge	0.156	2.572	0.011 <sup>a</sup>		
Perceived barriers	Constant	–	13.534	0.000	1.439	0.011
	Age	–0.058	–0.941	0.347		
	Knowledge	0.088	1.434	0.153		
Perceived self-efficacy	Constant	–	12.204	0.000	13.451	0.092
	Age	0.002	0.038	0.970		
	Knowledge	0.304	5.184	0.000 <sup>a</sup>		
Practice	Constant	–	5.409	0.000	4.451	0.079
	Perceived threat	0.023	0.327	0.744		
	Perceived benefits	0.032	0.402	0.688		
	Perceived barriers	–0.060	–0.828	0.409		
	Perceived self-efficacy	0.246	3.734	0.000 <sup>a</sup>		
	Cues to action	0.078	1.136	0.257		

$\beta$ , Standard regression coefficient  $\beta$  value; F, F-test coefficient value; p, probability value;  $R^2$ , determination coefficient value; t, t-test coefficient value. <sup>a</sup>There is a significant influence.

### The effect of pharmacists' beliefs and cues to action on the practice of active drug information service

A multiple regression was used to analyse the effect of pharmacists' belief (perceived threat, benefits, barriers, and self-efficacy) and cues to action on the practice of active drug information service to pregnant and breastfeeding women with chronic diseases. The results showed that individual belief and cues to action gave a weak effect on the practice of active drug information service ( $R^2 = 0.079$ ). It means that in only about 7.9% the practice of active drug information service was influenced by individual belief and cues to action, whereas for the rest, 92.1%, it was affected by other factors. Perceived self-efficacy was the only individual belief that influenced significantly the practice of active drug information services ( $p < 0.001$ ). While the other individual beliefs such as perceived threat, perceived benefits, and perceived barriers had no significant effect on the practice of active drug information service, followed by the cues to action ( $p > 0.05$ ). It can be seen that perceived self-efficacy was pharmacists' belief that affects the practice of pharmacists in providing drug information service actively in pregnant and breastfeeding women.

## Discussion

### The effect of modifying factor on pharmacists' beliefs

In this study, participants' gender, age, and work experience did not affect the pharmacists' beliefs (perceived threat, perceived benefits, perceived barriers, and self-efficacy) to provide an active drug information service for pregnant and breastfeeding women with chronic diseases. This result was similar to one study in Thailand ( $n = 110$ ), which found that there was no significant association between pharmacists' gender and the practice of providing drug information to pregnant women [9]. Another study showed that personal experience could affect a person to interpret a stimulus into a perception [10]. It seems that pharmacists' beliefs could be affected by their experience in serving pregnant or breastfeeding women. Most of the pharmacists in this study never had personal experience or had families who were pregnant or breastfeeding. This study also showed that there were no significant differences in the period of work experience towards pharmacists' beliefs in providing active drug information service. Pharmacists with 1-year work experience did not significantly differ from those who have 10 years or more of work experience. Our result was also supported by a study in Fitcha, Ethiopia, that the length of work experience did not significantly affect the knowledge, attitudes, and behaviour of health care professional including pharmacists.

This study also showed that age had no significant effect on pharmacists' perception beliefs. This can be because either young or old pharmacists received limited information regarding or access to medication used during pregnancy and breastfeeding. Their limited information was also due to not attending seminars or training about medication use in pregnant and breastfeeding women. One study suggests that as a person grows older, he/she will have more opportunities to get a lot of information through reading books, browsing the internet, or participating in training or seminar activities [11]. This study confirms that most of the pharmacists still have limitations in tracking information sources and seminars or training related to medication used during pregnancy and breastfeeding.

Meanwhile, pharmacists' knowledge affects their beliefs in terms of perceived threat, perceived benefits, and self-efficacy in providing active drug information services to pregnant and breastfeeding woman with chronic disease. The better pharmacists' knowledge is, the stronger their perceived threat, perceived benefits, and their self-efficacy are in providing active drug information services. Our results supported the HBM theory that individual knowledge about treatment during pregnancy and breastfeeding will affect their perceived threat, perceived benefits, and self-efficacy [12]. On the other hand, knowledge did not significantly affect the pharmacists' perceived barriers, as in this study only a few pharmacists in the community serve pregnant and breastfeeding patients.

### The effect of pharmacists' beliefs and cues to action towards the practice of active drug information service

Multiple regression analysis of the pharmacists' beliefs (perceived threat, perceived benefits, perceived barriers, and self-efficacy) and cues to action showed that there was a weak influence (<10%) towards the practice of active drug information service in pregnant and breastfeeding women. It can be explained that internal factors within the pharmacist could not trigger the pharmacist to take an action. The participation of the government, professional organisations, and owners of facilities also helps to create pharmacists' practice in accordance with their duties as professional health workers. Provision of education and information renewal programs to pharmacists who practice in the community, providing facilities to provide pharmacists the opportunity to practice professionally, and reducing pharmacist workloads by adding pharmacy staff at health centres can help pharmacists to improve their pharmaceutical care practice [13].

Moreover, the data showed that pharmacists' self-efficacy has the most significant effect on the practice of active drug information service during pregnancy and breastfeeding with chronic diseases. The greater the pharmacist's confidence in providing drug information service, the better the practice is. Therefore, several approaches can be carried out to improve pharmacists' self-efficacy by increasing the knowledge of pharmacists about medication used during pregnancy and breastfeeding. Based on the previous results, pharmacists with good knowledge tend to be more confident in providing knowledge. Provision of periodic seminars and training to pharmacists related to this topic to improve the self-efficacy and pharmacists's ability for managing pregnant and breastfeeding women particularly those with chronic diseases. At the academic level, adding curriculum related to the medication used during pregnancy and breastfeeding more deeply at the level of professional learning can provide useful provision for prospective pharmacists. The role of pharmacy organisations is also crucial to provide more training or seminar topics related to medication treatment during pregnancy and breastfeeding. Pharmacists are expected to provide appropriate education for pregnant and breastfeeding women that can improve the role of pharmacists as health care professionals in the community [14].

### Strengths and limitations

This study has some strengths and limitations. To our knowledge, this is the first study that explored the HBM constructs from the pharmacists' perspective focused on providing active drug information service to pregnant and breastfeeding women. This study also emphasises the commitment of community pharmacists providing practice in accordance with the responsibilities of pharmacist profession to improve patients' quality of life. The results of this study can be used to evaluate the practice of pharmacists in the community in improving the quality of life in pregnant and breastfeeding patients.

In this study, we did not analyse the influence of pharmacists' work experience on their beliefs (perceived threat, perceived benefits, perceived barriers, and self-efficacy). This study also did not involve pregnant and breastfeeding patients as study respondents, so the results of this study were retrieved from the pharmacists' points of view.



## Conclusion

The most influential factor in the practice of active drug information service for pregnant and breastfeeding women was perceived self-efficacy. The pharmacists' perceived self-efficacy can be increased by providing training or seminars to increase pharmacists' knowledge about the use of chronic disease medication during pregnancy and breastfeeding. Knowledge is one of the factors that influence the pharmacists' self-efficacy.

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**Competing interests:** Authors state no conflict of interest.

**Informed consent:** Informed consent was obtained from all individuals included in this study.

**Ethical approval:** Research involving human subjects complied with all relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration (as revised in 2013), and has been approved by the Human Research Ethics Committee of Faculty of Public Health Universitas Airlangga review board (56/EA/KEPK/2019).

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