

Original Article

## PHARMACISTS' PERCEPTION OF THEIR ROLE AND ASSESSMENT OF CLINICAL PHARMACY EDUCATION TO IMPROVE CLINICAL PHARMACY SERVICES IN INDONESIAN HOSPITALS

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Received: 10 Sep 2014 Revised and Accepted: 10 Oct 2014

### ABSTRACT

**Objectives:** To identify the pharmacists' perception on their role, barriers to implement clinical pharmacy services (CPSs), and importance of clinical pharmacy education (CPE) to improve CPSs in Indonesian hospitals.

**Methods:** A predetermined questionnaire was distributed to pharmacists (n=49) in Haji Adam Malik, Pirngadi, Haji, and Columbia Hospitals and staffs of Faculty of Pharmacy, University of Sumatera Utara, Indonesia for the two-month period in 2012. The participants were asked to choose answering yes or no for the importance of CPSs, poor to excellent for the current CPSs, not agree to strongly agree for the usefulness and target of CPE, way and whom to deliver it, rank priority-based topic of CPE, and choose the appropriate size, frequency, and duration of the CPE. The participants' responses were analyzed using Statistical Package for the Social Sciences (SPSS, version 19, Chicago, IL, USA).

**Results:** Mean age of the participants was  $48.38 \pm 10.66$  (years) with working experience of  $17.50 \pm 9.06$  (years). Most of them (82%) were female. The majority of them (79.2%) graduated pharmacy degree. Pharmacists (44.9%) argued that their understanding on clinical pharmacy (CP) was still fair. Nearly half of the participants (44.9%) revealed that CPSs in these hospitals were poor. Most of them declared that CPE was important to improve their knowledge and healthcare.

**Conclusions:** This study confirms that knowledge of pharmacists on CP as well as CPSs in Indonesian hospitals still need improvement through CPE to optimize health services.

**Keywords:** Role of Pharmacists, Perceptions, Clinical Pharmacy Education.

### INTRODUCTION

Few decades ago the roles of pharmacists were restricted only to manufacturing, compounding, and supplying drugs to patients [1]. As the number of marketed drugs and the practice of multiple drug therapy have increased, issues surrounding assessment of assured quality of drugs and their rational use have emerged globally. Pharmaceutical care has become an important subject to optimize patient care [2]. Thus, the roles of pharmacists around the world have been expanded to drug consultant, and patient-care providers since about the twentieth century [3].

Degree of the provided pharmaceutical care varies across countries [4]. Based on a survey conducted on perception of Canadian pharmacists, it could be summarized that the pharmacists felt that they have already performed five of the expanded roles including collaborative drug therapy management, public health outreach, prescriptive authority, patient self-care support, and dispensing leadership [5]. Currently in the US, the pharmacists need to be able to provide many functions in pharmaceutical care activities including drug monitoring and disease management programs, active participation in the healthcare team, consultation of drug utilization, outcomes research, drug informant, patient educator, formulary management and public health initiatives like hypertension and diabetes education programs, and immunizations [6, 7]. In developing countries, the role of pharmacists in healthcare services varies from one country to another and is still under continuous transition. In most developing countries, Pharmacists have not fully performed their new roles in the team of healthcare providers [8].

Pharmaceutical care has been found to improve patients' outcomes and efficiency of disease treatments. For example, with regard to economic outcomes, a study on impact of renal drug dosing service on dose adjustment on costs of hospitalized patients with chronic kidney disease (CKD) undertaken in a Malaysian hospital indicated that cost avoidance amounted to US \$2250 during a period of 4 month in 2007 [9]. A pharmacist-driven educational intervention

and counseling programs on patients with hypertension (n=98) in the university teaching hospital of Cova da Beira Hospital Centre, Portugal significantly improved the patients' adherence on the provided medications and blood pressure control [10]. Additionally, a review conducted by Salgado *et al* summarized that pharmacists' interventions in the management of CKD have shown positive impacts on the treatment outcomes [11]. Hence, these facts proved the importance of inclusion of pharmacists into the team of healthcare providers.

All of these achievements are highly determined by a wide range of factors such as sufficient knowledge, skills, attitudes of the pharmacists, acceptance by other healthcare providers, and support of the policy makers [12, 13]. Therefore, these factors should be reviewed and taken into account when an institution plans to establish programs to improve pharmaceutical care including CPSs. With respects to these issues, few studies on perceptions of healthcare providers on the extended roles of pharmacists have been conducted in different parts of the world [14-16]. However, the types of barriers and their priority vary from one country to another and to the large extent are affected by socioeconomic factors such as Asian countries including Indonesia. Thus, evaluation of the pharmacists' perception on their role, current condition of the provided CPSs, and barriers to the practice change are essential to identify issues currently faced by pharmacists in their practices. These findings would be the bases in development of strategies for the future plan in implementation and improvement of the extended roles of pharmacists in Indonesia. These findings are also an important consideration for the future inter-collaboration program among hospital pharmacists in Asian countries.

Therefore, the objectives of this study were to identify the perception of pharmacists on CPSs as an integral part of pharmaceutical care, the current conditions of human resources, and supporting equipments and budget availability associated with the role of pharmacists in implementing their duty as care givers, and strategies to improve the CPSs through implementation of CPE in hospitals.

## MATERIALS AND METHODS

This study was conducted in four hospitals and one health-related faculty in North Sumatera, Indonesia for the two-month period in 2012: Haji Adam Malik (HAM) Hospital, Pirngadi Hospital, Haji Hospital, Columbia Hospital, and Faculty of Pharmacy, University of Sumatera Utara. A multiple choice questionnaire prepared pertaining to improvement of CPSs provided by clinical pharmacists was developed and distributed to pharmacists (as participants) in these hospitals and faculty members whom supervise the last-year pharmacy students in these hospitals to implement their professional work. Since the size of the target population was small, all of the population was included in the study.

The questionnaire was completed by the participants under the supervision of the researcher to minimize bias. The participants

were asked to choose answering yes or no for the importance of CPSs, poor to excellent for the current CPSs and its determinants, not agree to strongly agree for the usefulness and target of CPE as well as way and whom to deliver it.

The participants were also asked to rank topics of CPE according to the priority and to choose the preferred size, frequency, and duration of the CPE.

### Data analysis

Responses of the participants were organized and entered into Statistical Package for the Social Sciences (SPSS, version 19, Chicago, IL, USA) for further analysis. Listed in Table 1 are the statistical analyses applied to the participants' characteristics and responses.

**Table 1: Statistical analysis of the participant characteristics and response category**

Characteristics of the participants:	Category	Statistical analysis
Age; working experience		Descriptive, frequency
Gender	Male/Female	Non parametric, binomial
Education		Descriptive, frequency
Importance of CPSs	Yes/no	Non parametric, binomial
CP implementation	Poor/fair/good	Descriptive, frequency
Understanding on CP		
Availability of:		
Supporting equipment		
Budget		
CPE attended supports duty in our institution	Yes/no	Non parametric, binomial
Provision of CPE is crucial	Agree/neutral/not agree	
Way to deliver CPE	Formal seminar/informal discussion/pamphlet distribution	Descriptive, frequency
Speaker of CPE	National/international/combination	
Target of CPE	Pharmacist who work in hospital/any pharmacist/Related healthcare provider	
Size of participants	<20/<40/< 80<100	
Frequency	Every: month/ 3 month/6 month/year	
Duration	Half-day/one-day/two-day	
Topic (ranking of 8 topics)		Friedman two-way analysis, descriptive, Chi-square

## RESULTS

### Characteristics of the participants

Of the 49 participants involved in this study, 40 participants were recruited from the four hospitals and 9 participants were selected from the University of Sumatera Utara.

Overall, mean age of the participants was  $48.38 \pm 10.66$  with working experience of  $17.50 \pm 9.06$  (years). Most of the participants (82%) were female. The majority of them (79.2%) graduated from the degree program, schools of pharmacy. The rest of the participants had master (14.3%) and PhD (6.1%) degrees.

### Perception of the participants on their roles

All participants (100%) declared that CPSs played important roles to improve healthcare. Most of them (78%) felt that CPEs that they have ever attended support their duty.

Nearly half of the participants (44.9%) revealed that CPSs in these hospitals were still poor, while only 28.6% of them declared that the CP implementation was good. The remaining participants (26.5%) considered the existing CP implementation as fair. Just 20.1% of the participants argued that they had the good understanding on CP, while 44.9% of them stated that they had only fair understanding on CP. The rest (34.7%) of them argued that they had poor understanding on CP. Furthermore, most of the participants (87.8%) confirmed that the provision of CPE was crucial to strengthen their background and to support the clinical pharmacy activities in these hospitals. Seventy eight percent of the participants believed that CPE could be best delivered through formal seminars provided by national and international educators. Most of them (70.7%) claimed that the main target of CPE was hospital pharmacists. Based on their opinions, it was effective to provide one-day seminar with the small group of audience (less than 20 persons) held in period of three months. Opinions of participants on CPE are shown in Table 2.

**Table 2: Opinions of the participants on CPE**

Subject	Category (%)
Provision of CPE is crucial	Agree/neutral/not agree (87.8/10.2/2).
Way to deliver CPE	Formal seminar/informal discussion/pamphlet distribution (78.0/14.6/7.3)
Speaker of CPE	National/National and International (10.2/89.8)
Target of CPE	Pharmacists who work in hospital/any pharmacist/related healthcare providers (70.7/26.8/2.4)
Size of participants	<20/<40/< 80<100 (87.8/12.2/0/0)
Duration	Half-day/One-day/Two-day (10.4/60.4/29.2)
Frequency	Every month/ Every 3 month/ Every 6 month (28.6/57.1/14.3)

### Barriers for the implementation of CPSS

In the context of barriers faced by the pharmacists to implement their extended roles identified in this study were limited only to supporting equipments and budget availability. More than half of the participants (59.2%) declared that supporting equipments were still poor in these hospitals. Only 12.2% of the participants stated that supporting equipments were good. The remaining participants (28.6%) argued that supporting equipments were sufficient. Most participants (61.4%) also revealed that budget availability was still poor to support their duty. Just 15.9% of them argued that budget availability was good to support their duty. The remaining participants (22.7%) stated that the available budget was sufficient to support their duty.

### Topics of clinical pharmacy education

The CPE topics (in decreasing order) suggested by the participants, are approaches to minimize drug related problems (DRPs) and optimize therapy, antibiotics utilization and proper usage, applied pharmacokinetics to optimized dose, pharmaceutical care, therapeutic drug monitoring, pharmacotherapy of specific diseases, total parenteral nutrition, and practical pharmacoconomics. There was statistically significant difference in term of subject priority required to be focused on,  $\chi^2_{(7)} = 100.10 > \chi^2_{(7) \text{ calc}} = 14.07, p = < 0.001$ .

### DISCUSSION

The roles of pharmacists have been expanded to drug consultant, service, and patient-care providers of the existing roles, a dispenser and supplier of pharmaceutical products. In order to implement these new roles, the pharmacists must be able to serve many functions [3]. Evaluation of the pharmacists' perception on their role as well as documentation and review of the patient-care given by the pharmacists are essential for the future plan of CPSS. However, patient-centered pharmacy practice in these hospitals has just been started since 2012.

These hospitals are the four largest ones located in the capital of North Sumatera, Medan. Adam Malik Hospital is the only class A hospital in the northern part of Sumatera Island (a class A hospital means it has broad facilities and capability of specialistic and subspecialistic healthcares) and it also serves as a referral hospital in that region. In addition, it is also one of the fifteen hospitals included into the pilot project for the case mix system by Indonesia Diagnostic Related Group (INA-DRG) in Indonesia. The system is part of the government effort to implement universal health coverage in Indonesia. Most of the participants (20 persons) were recruited from HAM hospital. Ten participants were pointed from Pirngadi hospital and the other 10 were sampled from Haji, and Columbia hospitals. The later three hospitals are classified into class B hospitals (a class B hospital has at least 11 specialistic and limited subspecialistic healthcares). Nine of the participants were faculty members pointed from Faculty of Pharmacy, University of Sumatera Utara. The faculty members supervise the last-year pharmacy students in these hospitals to implement their professional work. They are familiar with the existing CPSS in these hospitals. Thus, these mix participants provided fairly representative data and generalized study results.

Many factors were associated with the quality of the provided roles. One of the most critical determinants was preparedness and sufficient knowledge of the pharmacists to expand their role. In fact, only 20.4% of the participants argued that they were familiar with and understood how to apply CP concepts for patient care. The participants realized that CPSS was an integral part of the healthcare systems and could contribute to improve healthcare. For example, as argued by Cruthirds *et al*, pharmacists can play an important role and improve medication management in the healthcare systems [6]. Most of the participants (78 %) declared that CPEs they have ever attended support their duty. Most of them (87.8%) felt that CPE was crucial to support their new roles. As indicated by their mean age and long working experience, they were educated about 25 years ago in schools of pharmacy on the basis of pharmaceutical products orientation. This means that these pharmacists must be given opportunities to improve their knowledge and skill in CP. Thus, they

should become life-long learners. Therefore, improvement of their knowledge and skills through varieties of activities including continuous CPE according to their needs was important to contribute effectively in the team of healthcare providers.

Even though they update their skill by themselves, they argued that the current understanding of pharmacists on CP still needs to be improved since most of them were educated in schools of pharmacy on the basis of pharmaceutical products orientation. Thus, provision of CPE is crucial to strengthen their background and to support the clinical pharmacy activities in these hospitals. Curriculum in most schools of pharmacy in Indonesia have changed and included CP as a discipline since more than ten years ago. However, it still needs improvement and should be directed toward a more clinically focused. Studies have shown that skill improvement can be achieved through cooperation among educators between and within countries by learning each other. For example, it was stated that cooperation among US and Canadian pharmacy educators have the opportunity to implement the best of what each country has to offer and to facilitate new and better ways to educate future and existing pharmacists [17]. Also, cooperation among pharmacists in hospitals, national and international universities may be valuable to exchange experience and find out ways to solve the existing problems faced by pharmacists in hospitals and improve curricula in schools of pharmacy according to the needs of stakeholders.

As found in this study, supporting equipments like internet-accessable computer were still poor in these hospitals. Internet-accessable computer is also important to get accurate information to update their skills and to solve problems that they may face in their practices. As revealed by Cruthirds *et al* in their finding, institutional supports and acceptance of other healthcare providers (like physicians and nurses) are also the determinants of the successfulness of clinical pharmacy implementation [6]. Unfortunately, implementation of CP and availability of supporting equipments as well as budget in these hospitals has not been in accordance with as expected. Therefore, every effort should be done to resolve these problems.

With regard to CPE, most of the participants (70.7%) believed that it could be implemented through small group (less than 20 persons) of one-day formal seminars provided by national and international speakers to pharmacists mainly work in hospitals at frequency of three months. According to their opinions, the four major important subjects to cover were approaches to minimize DRPs and optimize therapy, antibiotics utilization and proper usage, applied pharmacokinetics to optimize dose, and pharmaceutical care. In other parts of the world, studies have indicated that application of these approaches in patient care have resulted in improved outcomes, reduced DRPs, hospital length of stay (LOS), and costs. For example, it has been proved that about 50-70 % of DRPs could be resolved under the influence of pharmacists' intervention [18]. Another study on impacts of community pharmacy intervention on DRPs in 13 different patient groups in Sweden judged that 32% of the adverse drug reactions were prevented or relieved [19]. A study on the impact of renal drug dosing service on dose adjustment in hospitalized patients with CKD was conducted by Hassan *et al* in Penang General Hospital. The finding indicated that cost avoidance amounted to US \$2250 during a period of 4 months in 2007 [9]. A randomized controlled study conducted by Pai *et al* on 104 patients with end-state renal disease (ESRD) found that drug use was lower in the group with pharmaceutical care compared to those receiving standard of care group [20]. Additionally, a review conducted by Salgado *et al* summarized that pharmacists' interventions in the management of CKD have shown positive impacts on the treatment outcomes [11]. The four major topics of CPE (approaches to minimize DRPs and optimize therapy, antibiotics utilization and proper usage, applied pharmacokinetics to optimized dose, and pharmaceutical care) must be highlighted for the future development of programs in the Installations of Pharmacy, in these hospitals.

There has been limited studies addressing perception on CPSS and CPE issues from different groups of healthcare providers in Indonesia. Nevertheless, similar studies have been performed

elsewhere. A study on sixty community pharmacists regarding their perception towards counseling and continuing clinical pharmacy education programs was undertaken in Nepal. The pharmacists realized that patient counseling was their responsibility and continuing education was important to improve their role in the provision of healthcare services [14]. A survey on practicing pharmacists in Canada indicated that they were eager to move away from their traditional roles to more patient-oriented. The pharmacists also felt that they required training for this transition [5]. Other studies on perceptions, experiences, and expectations of physicians regarding the role of pharmacists in hospital settings were also conducted in Jordan. More than half of the physicians were welcome that pharmacists counsel and educate their patients regarding appropriateness and safety use of the prescribed medications. Fewer physicians (28.2%) agreed that pharmacists informed them regarding DRPs experienced by their patients [15]. Another survey was undertaken in two hospitals (the University of Alberta and Stollery children's Hospitals) in Canada to develop an evidence-based model of proactive practice and to evaluate the satisfaction of pharmacists and other stakeholders up on restructuring of CPSs. The healthcare providers including pharmacists, physicians, and nurses felt that proactive pharmacists should be more widely available to improve patient outcomes in variety of in-patient setting [21]. Similar study on attitude of healthcare providers and medical students on CPSs was also conducted on three randomly selected hospitals and six health-related colleges in United Arab Emirates. This study indicated that most of the medical students and healthcare providers believed that clinical pharmacists can help improve the quality of healthcare services. The medical students and healthcare providers realized that clinical pharmacist is an important integral part of the healthcare team and expressed their willingness to cooperate with the clinical pharmacists [16]. A more recent study on the perception of pharmacists and physicians addressing the extended roles of pharmacists was performed in five selected hospitals in Tennessee. The healthcare providers reveal that pharmacist is an integral part of healthcare team and have a good perception on pharmacy practice [6].

With regard to preparedness of pharmacy student to provide pharmaceutical care, Binos *et al* conducted a cross sectional study (n=262) from nine pharmacy school on the perception of pharmacy students in Metro Manila. The students believe themselves to be ready and competent enough to provide pharmaceutical care, even though their competency in certain area still needs improvement [22]. The participants in this study were recruited only from one part in Indonesia. Thus, the study results may not apply to other parts of the country.

## CONCLUSION

Results of this study confirmed that 100% of the participants believed in the importance of CP. Knowledge of pharmacists on CP as well as supporting facilities to implement their new roles still needs improvement. Supports of the related institutions and other healthcare providers are also crucial to implement and improve CPSs.

## ACKNOWLEDGEMENT

We are thankful to all staffs of HAM, Pirngadi, Haji, and Columbia hospitals as well as Faculty of Pharmacy, University of Sumatera Utara for the valuable information to support this study.

## CONFLICT OF INTERESTS

Declared None

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