

Perception of Clinical Pharmacy Services by Doctors at Universitas Sumatera Utara Hospital

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ABSTRACT

Clinical Pharmacy Services (CPS) are essential components of patient care in clinical settings. This study aimed to assess doctors' perceptions of CPS at Universitas Sumatera Utara Hospital, Medan, Indonesia. Employing a descriptive mixed-methods design, the study utilized Importance-Performance Analysis (IPA) to collect both quantitative and qualitative data concurrently through semi-structured interviews guided by questionnaires. A total of 43 doctors participated in the study from October to December 2021. The results revealed that doctors collaborated with clinical pharmacists in CPS at rates ranging from 16% to 98%. Services related to drug regulatory information, medication reconciliation, and drug information were categorized in Quadrant II, indicating strong performance. In contrast, aspects involving pharmaceutical and clinical knowledge, patient medication histories, and clinical recommendations or interventions were placed in Quadrant III, suggesting that respondents perceived these services as less important. Interview insights further emphasized the need to enhance the scope and capacity of CPS.

Keywords: Importance-Performance Analysis (IPA), Doctor, Clinical pharmacy services, Pharmacist, Hospital, Implementation

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Introduction

Clinical Pharmacy Services (CPS) are integral to healthcare delivery, as they contribute to reducing hospital readmissions [1], preventing medication errors [2], and mitigating Drug-Related Problems [3], highlighting the need to enhance these services. However, in many developing countries, particularly those with high population densities, CPS is still at an early stage of development [4, 5]. Previous research has explored doctors' perceptions of clinical pharmacy to inform the improvement of these services [6, 7].

In Indonesia, CPS is regulated by the Ministry of Health, which established 72 hospital pharmaceutical service standards in 2016, encompassing eleven specific criteria. Prior studies assessing CPS through patient and pharmacist perspectives revealed that services such as drug information provision, patient medication histories, ward visits, and therapeutic drug monitoring were inadequately implemented and require further enhancement [8, 9]. Effective healthcare delivery requires clinical pharmacists to collaborate closely with doctors, nurses, and other healthcare professionals, making doctors' acceptance and comfort with CPS critical to its success [10].

Various approaches exist to evaluate service quality, including Servqual, the Customer Satisfaction Index (CSI), and Importance-Performance Analysis (IPA). IPA is a straightforward and effective tool for assessing service quality in healthcare [11], categorizing services into four quadrants based on importance (y-axis) and performance (x-axis). Quadrant I represents high importance but low performance, indicating poor service needing improvement; Quadrant II indicates high importance and high performance, reflecting well-executed services; Quadrant III reflects low importance and low performance, suggesting services perceived as less critical; and Quadrant IV represents low importance but high performance, indicating satisfaction with performance despite

relative unimportance [12]. Evaluating CPS using doctors' perspectives via IPA has not been previously reported. Therefore, this study aims to assess doctors' perception of CPS at Universitas Sumatera Utara Hospital, Medan.

Materials and Methods

This study was carried out from October to December 2021 at Universitas Sumatera Utara Hospital, which operates under the Ministry of Education, Culture, Research, and Technology. A total of 43 doctors, verified by their practice licenses, were purposively selected, ensuring representation of at least one doctor per section or specialty. All participants provided informed consent after receiving a full explanation of the study. Data were collected through semi-structured interviews.

CPS was evaluated according to the Indonesian technical guidelines for hospital pharmaceutical services, covering seven key areas: (1) pharmaceutical information; (2) clinical information; (3) drug regulatory information; (4) patient medication history; (5) medication reconciliation; (6) drug information services; and (7) recommendations and clinical pharmacy interventions. Interviews began by identifying whether respondents had experience with CPS and continued with 5-point Likert scales for performance (0 = not satisfied to 4 = very satisfied) and importance (0 = not important to 4 = very important).

Statistical analyses were conducted using SPSS (Statistical Package for Social Sciences). Questionnaire validity was confirmed through Pearson correlation, with all seven items showing *r*-values exceeding the table value, indicating validity. Reliability was assessed via Cronbach's Alpha, with values above 0.7 confirming the questionnaire's reliability. Mean values for performance and importance were plotted on an IPA Cartesian diagram. The interview flowchart is presented in **Figure 1**.

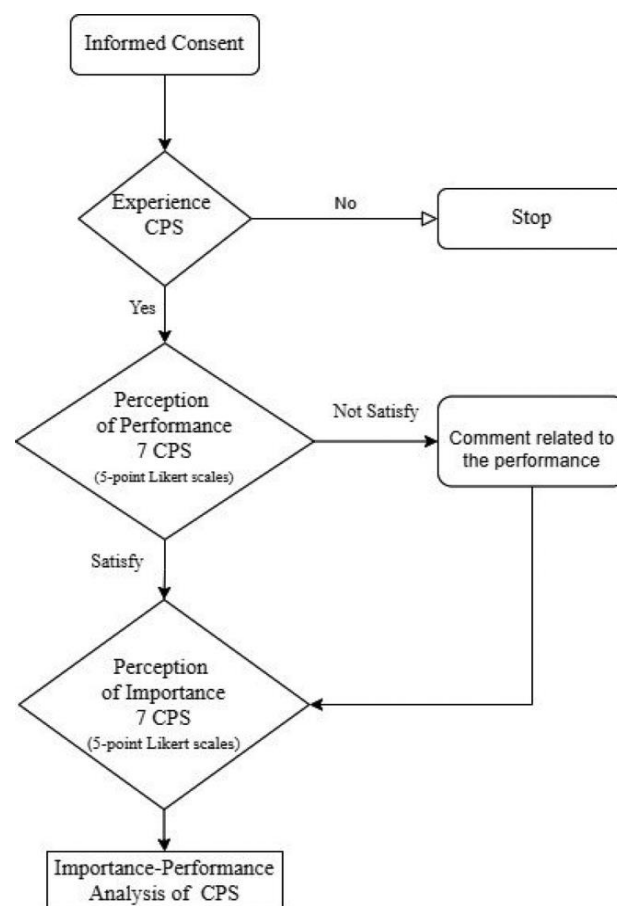


Figure 1. Flowchart of the Interview Process

Results and Discussion

The 43 participating doctors represented 12 sections or specialties, including General Practice, Pediatrics, Anesthesiology, Surgery, Cardiology, Dermatology, Obstetrics and Gynecology, Internal Medicine,

Pulmonology, Psychiatry, Neurology, and Ophthalmology. The findings indicated that doctors engaged with CPS in collaboration with clinical pharmacists at rates ranging from 16% to 98%. Detailed information is presented in **Table 1**.

Table 1. Identification of doctors' experiences with CPS

No.	CPS Component	Number of Respondents (Persons)	Percentage (%)
1	Pharmaceutical information	7	16
2	Clinical information	13	30
3	Drug regulatory information	42	98
4	Patient medication history	11	26
5	Medication reconciliation	27	63
6	Drug information services	37	86
7	Recommendations and clinical pharmacy interventions	19	44

Doctors who had engaged with clinical pharmacy services were subsequently assessed for their satisfaction and perceived importance using a Likert scale, as presented in **Table 2**.

Table 2. Assessment of performance and perceived importance

CPS	Respons of Performance (5-Point-Likert Scale)					Respons of Importance (5-Point-Likert Scale)				
	4	3	2	1	0	4	3	2	1	0
Pharmaceutical information	0	4	2	1	0	1	6	0	0	0
Clinical information	0	7	5	1	0	2	11	0	0	0
Drug regulatory information	0	22	13	7	0	4	33	4	1	0
Patient medication history	0	5	4	2	0	0	9	2	0	0
Medication reconciliation	0	15	7	3	2	2	23	2	0	0
Drug information services	1	28	6	2	0	1	28	6	2	0
Recommendations and clinical pharmacy interventions	0	5	6	6	2	1	18	0	0	0
Likert Scale	4:very important					4:very important				
	3:important					3:important				
	2:moderately important					2:moderately important				
	1:less important					1:less important				
	0:not important					0:not important				

The performance and importance data were compiled and analyzed statistically using the IPA method. The overall mean values for performance ($\bar{x} = 1.748$) and importance ($\bar{y} = 2.085$) served as the intersection points for the axes in the Cartesian diagram, dividing it into four quadrants, with each CPS component positioned according to its average value, as illustrated in **Figure 2**.

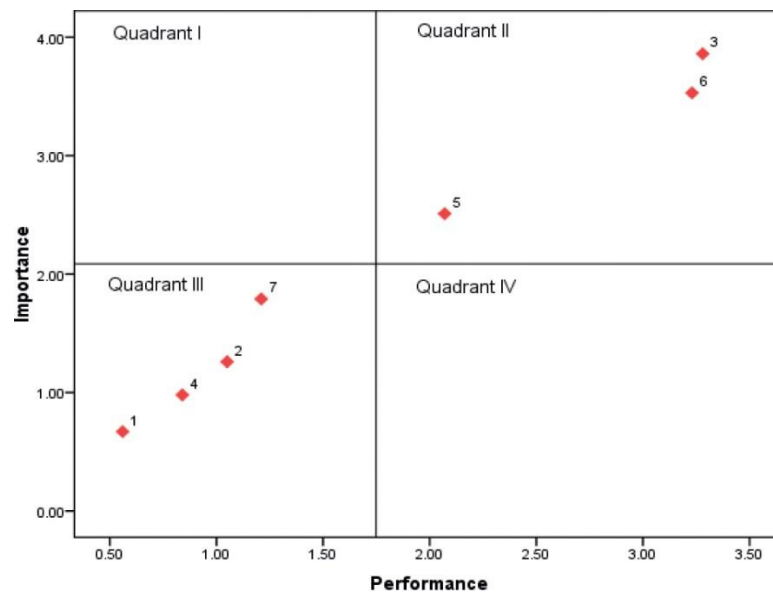


Figure 2. IPA diagram of CPS based on doctors' perception

According to the results, (3) drug regulatory information, (5) medication reconciliation, and (6) drug information services are positioned in Quadrant II, indicating that their performance aligns well with doctors' expectations. In contrast, (1) pharmaceutical information, (2) clinical information, (4) patient medication history, and (7) recommendations and clinical pharmacy interventions fall into Quadrant III, suggesting that doctors consider these services less important. The factors contributing to doctors' lower perception of the performance and importance of CPS are detailed in the interview notes presented in **Table 3**.

Table 3. Interview notes on CPS

CPS Component	Interview Notes	Number of Respondents
Pharmaceutical information	Experienced occasionally, but infrequently.	1
Clinical information	Experienced occasionally, but infrequently.	1
Drug regulatory information	Doctors are aware of regulations when prescribing, but adjusting therapy is challenging.	6
Patient medication history	Experienced occasionally; sometimes the doctor records it themselves.	1
Medication reconciliation	Data are documented in medical records; verbal communication is expected as a follow-up.	2
Drug information services	Responses from clinical pharmacists are delayed and not immediate.	2
Recommendations and clinical pharmacy interventions	Experienced occasionally, but infrequently.	6

The interview notes indicate that the low perception is primarily due to doctors' limited exposure to CPS.

Doctors' experiences indicate that CPS is most consistently applied in the area of drug regulatory information, while engagement with pharmaceutical aspects, clinical aspects, and patient medication histories remains low (<30%), reflecting the level of interaction between doctors and clinical pharmacists. Greater development of CPS is associated with increased collaboration within the clinical team [10].

IPA analysis revealed that (3) drug regulatory information, (5) medication reconciliation, and (6) drug information services fall into Quadrant II, meaning their performance meets doctors' expectations. According to interview insights in **Table 3**, these services could be improved through periodic training or updates on drug regulations to facilitate early therapy adjustments. The reconciliation process should be consistently conducted for all patients and include not only documentation in medical records but also verbal communication with doctors, which is more effective at resolving discrepancies [13].

Clinical pharmacists are recognized as reliable sources of drug information. Enhancing their ability to provide timely responses can maintain satisfaction [14], achievable through ongoing training, continuing education programs [15], and the integration of artificial intelligence tools [16].

In contrast, (1) pharmaceutical information, (2) clinical information, (4) patient medication history, and (7) recommendations and clinical pharmacy interventions are in Quadrant III, indicating that doctors perceive these services as less important. Limited exposure, as shown in **Table 1**, contributes to the low perception of pharmaceutical information, which in Indonesian regulations encompasses interventions on drug names, dosage forms, strengths, quantities, stability, and usage instructions, all of which are proven to reduce prescription errors. Insufficient competency and productivity of clinical pharmacists further reinforce this perception.

Doctors' perception of the role of clinical pharmacists in patient medication histories is also low [17], likely because the benefits have not yet been directly experienced. Although documenting patient medication histories can reduce doctors' workload and prevent medication errors [18], these histories are often incompletely recorded by doctors and nurses, excluding over-the-counter drugs, vitamins, and herbal products [19]. Clinical pharmacists can play a crucial role in filling this gap to improve healthcare delivery.

Overall, interview findings indicate that doctors are less satisfied with CPS largely because they rarely experience it, suggesting that these services are not yet fully implemented. One major challenge is balancing clinical and logistical responsibilities. Delegating logistical tasks to assistant pharmacists could allow clinical pharmacists to focus on patient-centered services [20]. Additionally, ward rounds and collaborative visits with doctors, nurses, and other healthcare staff can raise awareness of clinical pharmacists' contributions [21]. Adequate staffing proportional to workload is necessary to ensure productivity and effective service delivery.

Conclusion

Doctors have engaged with the CPS provided by clinical pharmacists. IPA analysis shows that services related to drug regulatory information, medication reconciliation, and drug information meet doctors' expectations. Conversely, pharmaceutical and clinical information, patient medication histories, and recommendations and clinical pharmacy interventions are perceived as less important. Therefore, targeted improvements based on interview insights are needed to strengthen CPS and optimize healthcare delivery.

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