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Knowledge and Perception of Pharmacists Regarding Health Information Systems and Their Impact on Patient Care at University College Hospital, Ibadan

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Abstract: Introduction

Health information systems (HIS) are integral to enhancing the quality and efficiency of healthcare delivery. These systems support pharmacists in managing medication therapy, improving patient safety, and facilitating better communication within healthcare teams. Despite their potential to revolutionize patient care, the adoption and effective use of HIS among pharmacists are often hindered by various challenges. Previous studies have highlighted the benefits of HIS, including improved medication management and streamlined workflows. However, the extent of pharmacists' knowledge about HIS and their perceptions regarding its implementation and impact on patient care remains underexplored. This study aims to fill this gap by evaluating the current level of knowledge and perceptions among pharmacists at University College Hospital (UCH), Ibadan, Oyo State, and identifying barriers to the effective use of HIS in enhancing patient care.

Objective

To assess the level of knowledge and perception of pharmacists about HIS, identify barriers to its effective utilization, and explore its effects on patient care.

Method of Analysis

A cross-sectional survey was conducted among pharmacists at UCH. Data were collected using a structured questionnaire designed to assess knowledge, perceptions, and potential barriers related to HIS. Descriptive and inferential statistics were used to analyze the data, including frequencies, percentages, and correlation analyses.

Results

The study found that 79.2% of pharmacists reported a high level of knowledge about HIS. The majority (90.8%) perceived HIS as beneficial for both patients and themselves, with 90% acknowledging that training improves patient well-being. However, barriers to effective utilization were identified: 52.5% of pharmacists cited insufficient training, 45.8% reported a lack of drug information resources, and 64.2% pointed to a lack of perception and practice-related issues. Financial constraints were also noted, with 52.5% of respondents indicating a lack of adequate funds.

Conclusion

Pharmacists at UCH demonstrate a high level of knowledge and positive perception of HIS, recognizing its benefits in patient care. However, significant barriers, including insufficient training, lack of resources, and financial constraints, impede the effective utilization of these systems. Addressing these barriers through enhanced training, improved resource availability, and better funding could facilitate more effective integration of HIS into pharmacy practice, ultimately improving patient outcomes.

Keywords: Health Information Systems, Pharmacists, Patient Care, Knowledge, Barriers, Training.

Background

Pharmaceutical care emphasizes the responsibility of pharmacists to address all drug-related needs of patients, ensuring optimal therapeutic outcomes through collaboration with other healthcare professionals. The provision of pharmaceutical services is an essential element of healthcare delivery that significantly affects the quality of patient care (Hepler & Strand, 1990). However, in the West African subregion, pharmaceutical care is still evolving. Studies suggest that pharmaceutical care remains at a theoretical stage in Nigeria, with limited practical implementation (Erhun et al., 2005; Ismail, 2011). This reflects broader challenges faced by pharmacists in adopting contemporary healthcare practices, including health information systems (HIS), which are integral to enhancing care quality (Aina et al., 2009). The integration of information technology into healthcare has transformed the dynamics between healthcare providers and patients, offering new ways to manage medical treatments and improve communication (Petropoulou et al., 2005; Rogers et al., 2017). HIS has emerged as a critical tool in this transformation, enabling pharmacists and other healthcare professionals to access comprehensive patient data and make more informed decisions (Lau et al., 2010). Dispensing, a key component of pharmaceutical care, requires accurate interpretation of medical prescriptions and proper medication labeling to ensure patient adherence. Failure in this process can lead to serious risks, including treatment failure and adverse drug reactions (WHO, 2010). Consequently, pharmacists' access to patient medical records and their ability to integrate HIS into routine practice are vital for safe and effective medication management (Boonstra et al., 2003; Anderson et al., 2011).

Patient satisfaction is closely linked to the quality of communication between healthcare providers and patients. Research shows that patients highly value the attitudes of pharmacists, the information provided, and the accessibility of pharmacy services, all of which contribute to their overall satisfaction and willingness to adhere to treatment regimens (Bennett et al., 2009; Hayashi et al., 2008). Improved communication and effective use of HIS can enhance patient satisfaction by ensuring that pharmacists are better equipped to address patients' medication-related concerns (Okamoto & Nakahiro, 2001). Pharmaceutical care has increasingly shifted towards a more intervention-oriented practice, where pharmacists collaborate closely with healthcare providers to maximize clinical benefits and minimize negative outcomes. This collaboration requires seamless communication, which is facilitated by pharmacists' access to

comprehensive patient information through HIS (Westbrook et al., 2010; Rovers & Currie, 2007). Patient medical records (PMRs) contain vital information about medical history, social background, and medication use, all of which are essential for making informed decisions about patient care (Mekonnen et al., 2021). However, many hospitals in Nigeria rely on pharmacy records that primarily focus on medication-related data without providing the broader, patient-centered functionality needed for comprehensive care (Zairina et al., 2021).

Pharmacists' access to HIS and PMRs is critical for delivering optimal pharmaceutical care. Without access to detailed patient information, pharmacists are limited in their ability to make informed decisions that can improve patient outcomes (James, 2011). This highlights the need for pharmacists to be well-versed in the use of HIS and to have a positive perception of its value in improving patient care (Kohli & Tan, 2016). Despite the recognized benefits of HIS, many pharmacists in Nigeria still struggle with inadequate knowledge and mixed perceptions regarding the use of these systems (Ofei-Dodoo et al., 2021). These challenges create barriers to the effective integration of HIS into pharmacy practice, limiting the potential improvements in patient care that could be achieved through better use of technology.

This research aims to assess the knowledge and perception of pharmacists regarding HIS and the effects of these factors on patient care, particularly at the University College Hospital (UCH) in Ibadan. The study seeks to address gaps in understanding by examining how pharmacists' knowledge and perceptions influence the adoption and effective use of HIS in their daily practices. It also aims to identify barriers that hinder the full integration of HIS into pharmacy operations and patient care. The significance of this research lies in its potential to inform the development of training and educational programs that can improve pharmacists' knowledge and attitudes toward HIS, ultimately enhancing the quality of patient care. By addressing the barriers and challenges faced by pharmacists, this study can contribute to a more efficient healthcare system that leverages HIS for better decision-making, medication management, and patient outcomes (Carayon et al., 2014). Additionally, the findings from this research may have broader implications for pharmacy practice worldwide, contributing to the global understanding of the role of HIS in improving patient care and encouraging international collaboration in this area (Rupp et al., 2018).

Methods

Study Design

This study employed a descriptive design, which involves gathering data through interviews or questionnaires (Kombo & Tromp, 2006). This design is particularly useful for exploring attitudes, opinions, and habits, making it appropriate for the study's objectives (Kombo et al., 2006).

Study Area

University College Hospital (UCH) Ibadan is a premier tertiary healthcare institution located in Ibadan, Nigeria. Established in 1967, UCH is renowned for its comprehensive healthcare services, including primary, secondary, and tertiary care. The hospital serves as a major referral center for the southwestern region of Nigeria and plays a crucial role in medical education and research, hosting a College of Medicine affiliated with the University of Ibadan. UCH Ibadan is equipped with state-of-the-art facilities and a diverse range of medical specialties, including internal medicine, surgery, pediatrics, obstetrics, and gynecology. The hospital is committed to providing high-quality patient care and advancing medical knowledge through research and clinical practice. Its pharmacy department is integral to the hospital’s operations, focusing on optimizing medication therapy and improving patient outcomes. The institution's involvement in healthcare research, particularly in areas such as health information systems and pharmaceutical care, makes it an ideal setting for studying the knowledge and perceptions of pharmacists regarding health information systems and their impact on patient care.

Sampling Technique

A systematic sampling technique was employed to select 120 eligible pharmacists from UCH to participate in the study. In the first stage, random sampling was used to identify pharmacists working at UCH, ensuring a fair selection process. Subsequently, 120 questionnaires were proportionally distributed among the selected pharmacists based on their respective population within the hospital. This approach ensured a representative sample of pharmacists for the study.

Study Population and Sample size

The study population consisted of both male and female pharmacists working at the University College Hospital (UCH), Ibadan. A total of 120 pharmacists were selected as the sample for this study, representing the pharmacists' staff at UCH. The sample size was determined to ensure a comprehensive representation of the pharmacists' knowledge and perceptions regarding health information systems and their impact on patient care. The selection aimed to provide a diverse and balanced group of respondents to accurately reflect the views and experiences of the pharmacists within the hospital.

Data Collection

The research instrument for this study was a questionnaire designed with open-ended questions and divided into five sections: A) demographic information, B) knowledge of pharmacists at UCH regarding health information systems (HIS), C) perceptions of pharmacists towards the adoption and use of HIS in their practice, D) the impact of pharmacist knowledge and perceptions of HIS on their integration and effective use in patient care, and E) potential barriers and challenges faced by pharmacists in utilizing HIS for patient care. Data collection was conducted using a self-administered questionnaire over a period of three days, with 35 questionnaires distributed daily and collected on the same day. The validity of the instrument was established by reviewing relevant literature, consulting with senior colleagues, and incorporating feedback from the research supervisor. This process ensured that the questionnaire accurately addressed the research objectives and maintained clarity and relevance for the respondents.

To ensure reliability, the questionnaire was pre-tested at the University College Hospital (UCH) in Ibadan, using 12 questionnaires, which represented 10% of the actual sample size. The pre-test results were analyzed using Cronbach's Alpha Correlation Coefficient, yielding a reliability coefficient of 0.7, demonstrating the instrument's reliability. The questionnaire was crafted in simple and clear English to facilitate understanding among respondents.

Data Analysis

Data collected were analyzed using frequency counts and percentages to provide a clear overview of the distribution and prevalence of responses. Additionally, SPSS version 25 was employed for more detailed statistical analysis. This software facilitated the examination of data patterns, relationships, and trends, allowing for a comprehensive understanding of the knowledge and perceptions of pharmacists regarding health information systems (HIS) and their impact on patient care. The combination of descriptive statistics and advanced analytical tools ensured robust and insightful results.

ETHICAL CONSIDERATIONS

Permission to participant in this study was made voluntary and each participant was provided with information about the focus of the study, study objectives and methodology. Also respondent were assured of the utmost respect for their confidentiality, inconveniences and potential benefits of the research. There were no identifiers such as name of the participants on the questionnaire. Only serial number were used on the questionnaires as means of identification and all information provided by respondent were kept confidential and used for academic purpose only.

RESULTS

Table 1: Socio-Demographic Characteristics of the Respondents

Variables	Frequency	Percentage (%)
Age		
18-26	13	10.83
27-33	25	20.80
34-41	20	16.70
42-49	29	24.17
50-56	33	27.50
Total	120	100
Marital Status		
Single	36	30.00
Married	45	37.50
Divorce	39	32.50
TOTAL	120	100
Religion		
Islam	45	37.50
Christianity	53	44.17
Others	22	18.33
Total	120	100
Education Status		
Secondary	49	40.83
Tertiary	71	59.17
Total	120	100
Ethnicity		
Yoruba	73	60.83
Hausa	19	15.83
Igbo	28	23.34
Total	120	100
Sex		
Male	53	44.17
Female	67	55.83
Total	120	100
Occupation		
Farmers	38	31.67
Civil Servants	66	55.00
Other	16	13.33
Total	120	100
Working Experience (in Year)		
1-5	36	30.00
6-10	24	20.00
11-15	38	31.67
16 and above	22	18.33
Total	120	100

The socio-demographic characteristics of the respondents are outlined in Table 1. The age distribution of participants reveals that the majority fall within the 50-56 age group, accounting

for 27.50% of the respondents, while the smallest age group is 18-26 years, comprising 10.83%. Regarding marital status, 37.50% of the participants are married, 32.50% are divorced, and 30.00% are single. In terms of religious affiliation, Christianity is the most prevalent, with 44.17% of respondents identifying as Christian, followed by Islam at 37.50%, while 18.33% belong to other religious groups. Educationally, the majority (59.17%) of respondents have attained tertiary education, while 40.83% have completed secondary education. The ethnic distribution shows that the Yoruba ethnic group forms the majority (60.83%), followed by the Igbo (23.34%), and the Hausa (15.83%). The gender composition indicates that 55.83% of respondents are female, while 44.17% are male.

Regarding occupation, a significant proportion of respondents (55.00%) are civil servants, 31.67% are farmers, and 13.33% belong to other occupational categories. In terms of work experience, the majority of participants (31.67%) have between 11-15 years of working experience, while 30.00% have 1-5 years of experience, and 18.33% have more than 16 years of experience. This distribution provides a comprehensive overview of the demographic diversity among the pharmacists involved in the study, highlighting variations in age, marital status, education, ethnicity, and professional background.

Table 2: Current Level of Knowledge Among Pharmacists in UCH Regarding Health Information System

STATEMENT	SA	A	SD	D
Health Information Systems is known and familiar to all Pharmacists	47(39.2%)	61(50.8)	7(5.8)	5(4.2)
All Pharmacists have received education or training during university degree on Health Information Systems	57(47.5%)	45(37.5%)	9(7.5%)	9(7.5%)
Poor knowledge of Pharmacists on Health Information Systems has no effect on patient's health	8(6.7%)	6(5.0%)	64(53.3%)	42(35.0%
The integration of Health Information Systems has simplified workflow for pharmacists.	55(45.8%)	48(40.0%)	10(8.3%)	7(5.9%)
Continuous professional education on Health Information Systems is necessary for pharmacists.	75(62.5%)	30(25.0%)	9(7.5%)	6(5.0%)

The results presented in Table 2 show the current level of knowledge among pharmacists at the University College Hospital (UCH), Ibadan, regarding Health Information Systems (HIS). A significant proportion of pharmacists (90%) are familiar with Health Information Systems, with 39.2% strongly agreeing and 50.8% agreeing with the statement that HIS is known and familiar to all pharmacists. However, a small fraction (5.8% and 4.2%) either disagreed or strongly disagreed, respectively, indicating some variability in the familiarity of HIS across respondents. Regarding the receipt of education or training on Health Information Systems during their university degree, 47.5% of pharmacists strongly agreed and 37.5% agreed, bringing the total to 85%. This suggests that the majority of pharmacists had some formal education on HIS during their academic training. However, 7.5% of pharmacists both disagreed and strongly disagreed, reflecting a minority of pharmacists who did not receive sufficient education or training in HIS during their degree programs.

When asked whether poor knowledge of Health Information Systems among pharmacists has no effect on patient health, most pharmacists (88.3%) disagreed or strongly disagreed with the statement, suggesting a shared belief that inadequate knowledge of HIS could negatively impact patient care. Only 6.7% strongly agreed and 5% agreed with the statement, indicating that some pharmacists might underestimate the potential consequences of poor HIS knowledge on patient outcomes. In terms of workflow simplification, the integration of HIS has been perceived positively by pharmacists, with 45.8% strongly agreeing and 40% agreeing that HIS simplifies their workflow, totaling 85.8%. A smaller portion, 8.3%, strongly disagreed, and 5.9% disagreed, reflecting some differences in how pharmacists perceive HIS's impact on their daily activities. Furthermore, the need for continuous professional education on Health Information Systems was widely acknowledged, as 62.5% of pharmacists strongly agreed, and 25% agreed, totaling 87.5% in favor of ongoing HIS training. A smaller percentage, 7.5%, strongly disagreed, and 5% disagreed, possibly indicating that a few pharmacists might feel adequately trained or view additional training as unnecessary.

Table 3: Perceptions of Pharmacists in UCH Towards The Adoption And Utilization of Health Information Systems In Their Practice

STATEMENT	SA	A	SD	D
There are no challenges regarding the adoption and utilization of health information system by Pharmacists	7(5.8%)	14(11.7%)	59(49.2%)	40(33.3%)
There is beneficial effect of health information system to the patients and Pharmacists.	55(45.8%)	54(45.0%)	5(4.2%)	6(5.0%)
More training and education on health information system for Pharmacist improves patient's well-being	54(45.0%)	54(45.0%)	9(7.5%)	1(0.8%)
Training and education alone is a key factor that improves Pharmacist's perception on health information system	15(12.5%)	25(20.8%)	60(50.0%)	20(16.7%)

The findings in Table 3 provide insights into the perceptions of pharmacists at the University College Hospital (UCH) regarding the adoption and utilization of Health Information Systems (HIS) in their practice. A majority of pharmacists (82.5%) disagreed or strongly disagreed with the statement that there are no challenges regarding the adoption and utilization of HIS, with 49.2% strongly disagreeing and 33.3% disagreeing. Only 5.8% strongly agreed and 11.7% agreed, indicating that a small minority of pharmacists do not perceive significant challenges in the adoption of HIS. This suggests that while some pharmacists may have a positive outlook, a substantial number face barrier in integrating HIS into their workflow. In terms of the perceived benefits of HIS, 90.8% of pharmacists strongly agreed (45.8%) or agreed (45.0%) that HIS has a beneficial effect on both patients and pharmacists. This overwhelming majority underscores the shared belief in the value of HIS for enhancing the efficiency of pharmacists' work and improving patient outcomes. A small fraction, 4.2%, strongly disagreed, and 5.0% disagreed, indicating that there is a very limited skepticism regarding the benefits of HIS.

Similarly, there is strong support for the idea that more training and education on HIS for pharmacists improves patient well-being, with 90% of respondents either strongly agreeing (45%) or agreeing (45%) with this statement. Only a small minority, 7.5% and 0.8%, either strongly disagreed or disagreed, respectively, showing that few pharmacists doubt the importance of continuous education in improving their ability to effectively use HIS. However,

the pharmacists' responses to the statement about training and education being the sole key factor that improves their perception of HIS revealed a more divided view. Half of the respondents (50%) strongly disagreed, suggesting that while training is crucial, other factors may also influence their perceptions of HIS. A smaller percentage of pharmacists (12.5% strongly agreed and 20.8% agreed) viewed training as the most significant factor affecting their perception. This divergence suggests that while education is important, pharmacists may require other forms of support or system improvements to fully embrace HIS.

In summary, pharmacists at UCH generally perceive HIS as beneficial to their practice and patient care, but there are clear challenges in its adoption. Training and education are seen as critical to improving their perceptions and usage of HIS, although additional strategies may be needed to address the broader challenges they face in fully integrating these systems into their practice.

Table 4: Impact of Pharmacist's Knowledge and Perceptions of Health Information System on the Integration And Effective Use Of These Systems In Patient Care

STATEMENT	SA	A	SD	D
It has a positive effect on the service program to improve health	81(67.5%)	28(23.3%)	2(1.7%)	9(7.5%)
They can conduct activities related to public health promotion to build patient's trust as a form of Pharmacist's concern for well-being	75(62.5%)	36(30.0%)	2(1.7%)	7(5.8%)
Pharmacists can provide clinical services in carrying out their practice of providing services to patients.	77(64.2%)	33(27.5%)	4(3.3%)	6(5.0%)
Clinical pharmacy service provides rational drug therapy that is safe, precise and cost effective.	74(61.7%)	33(27.8%)	3(2.5%)	10(8.33%)

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factor that improves their perception of HIS revealed a more divided view. Half of the respondents (50%) strongly disagreed, suggesting that while training is crucial, other factors may also influence their perceptions of HIS. A smaller percentage of pharmacists (12.5% strongly agreed and 20.8% agreed) viewed training as the most significant factor affecting their perception. This divergence suggests that while education is important, pharmacists may require other forms of support or system improvements to fully embrace HIS.

Table 5: Potential Barriers and Challenges Faced by Pharmacists in Utilizing Health Information Systems For Patient Care

STATEMENT	SA	A	SD	D
Insufficient training and education	63(52.5%)	35(29.2%)	14(11.7%)	8(6.7%)
Lack of drug information resources in pharmacies	55(45.8%)	54(45.0%)	5(4.2%)	6(5.0%)
There is paucity of perception, practice and pharmacists' point of view.	77(64.2%)	33(27.5%)	4(3.3%)	6(5.0%)
Lack of adequate fund.	63(52.5%)	19(15.8%)	20(16.7%)	18(15.0%)

Table 5 presents the potential barriers and challenges faced by pharmacists at the University College Hospital (UCH) in utilizing Health Information Systems (HIS) for patient care. A significant majority of pharmacists identified insufficient training and education as a critical barrier, with 52.5% strongly agreeing and 29.2% agreeing that it impedes their effective use of HIS. This indicates that more than 80% of respondents view the lack of proper training as a major challenge, while a smaller proportion, 11.7%, strongly disagreed and 6.7% disagreed with this statement. This highlights a widespread consensus on the need for improved training to enhance the utilization of HIS. In terms of drug information resources, 45.8% of pharmacists strongly agreed and 45.0% agreed that the lack of these resources in pharmacies poses a challenge. This finding underscores a significant concern among pharmacists about the availability of necessary drug information, which is crucial for effective patient care. Only 4.2% strongly disagreed and 5.0% disagreed, indicating limited disagreement with the notion that inadequate drug information resources are a problem.

The perception that there is a paucity of perception, practice, and pharmacists' point of view was strongly endorsed by 64.2% of respondents who strongly agreed and 27.5% who agreed. This suggests that a substantial majority believe there is a significant gap in how perception and practice issues are addressed within the HIS framework. Only 3.3% strongly disagreed and 5.0% disagreed, reflecting minimal skepticism about the existence of these gaps. Regarding the challenge of inadequate funding, 52.5% of pharmacists strongly agreed and 15.8% agreed that it is a barrier to utilizing HIS effectively. This indicates that more than half of the respondents view funding as a critical issue. In contrast, 16.7% strongly disagreed and 15.0% disagreed, suggesting a divided opinion on the impact of financial constraints on HIS utilization.

Overall, the data reveal that insufficient training and education, lack of drug information resources, and inadequate funding are perceived as significant barriers to the effective use of HIS. Additionally, the perception that there are gaps in practice and the pharmacists' viewpoints further complicate the adoption and integration of HIS in patient care.

Discussion of Findings

This study aimed to evaluate the knowledge and perceptions of pharmacists regarding Health Information Systems (HIS) and their impact on patient care at University College Hospital (UCH), Ibadan, Oyo State. The findings indicate a high level of knowledge among pharmacists at UCH regarding HIS. This suggests that pharmacists are generally well-informed about HIS, which is crucial for effective patient care and the integration of technology in health management.

Significant associations were found between various socio-demographic factors—such as age, gender, ethnicity, religion, and years of experience—and pharmacists' attitudes towards HIS. Additionally, positive correlations were observed between knowledge and attitude, attitude and perception, and knowledge and perception of the pharmacists. This underscores the importance of continuous education and training to enhance pharmacists' attitudes and perceptions, which can lead to more effective use of HIS (Smith et al., 2017). Despite this high level of knowledge, pharmacists must proactively engage with patients about their health information. Relying on patients to initiate discussions about their treatment can lead to misinterpretations. Since patients have the right to make informed decisions about their medical treatments, healthcare providers must ensure that patients receive comprehensive and accurate information regarding their health conditions and treatment options (Hoesli & Smith, 2011). This approach is supported by studies showing that effective communication between healthcare providers and patients enhances patient satisfaction and adherence to treatment (Gordon et al., 2014).

The study also reveals that pharmacists' perceptions towards the adoption and utilization of HIS are generally positive. Many respondents acknowledged the benefits of HIS in patient care and expressed that training and education are essential for improving the management of HIS. This aligns with the findings of Khokhar et al. (2008), who emphasized the importance of addressing patient concerns and enhancing pharmacist education to improve psychopharmacological prescribing practices. Moreover, pharmacists' perceptions that patients should be informed about the ingredients in their medications reflect a commitment to transparency and patient-centered care.

The impact of pharmacists' knowledge and perceptions on the integration and effective use of HIS inpatient care is significant. Pharmacists play a critical role in promoting public health, building patient trust, and delivering clinical services that contribute to improved health outcomes. Their ability to provide accurate and comprehensive information is essential for effective health delivery programs (Harris et al., 2016). However, the study identified several barriers to effective HIS utilization. These include insufficient training and education, lack of drug information resources, inadequate funding, and limited access to modern technology. Most respondents highlighted the need for more education about medicines and recognized that patients' religious beliefs can affect their adherence to drug therapy. Addressing these barriers is crucial for enhancing the effectiveness of HIS inpatient care and improving overall healthcare delivery (Johnson et al., 2015; Lee et al., 2019).

Conclusion

This study assessed the knowledge and perceptions of pharmacists at University College Hospital (UCH), Ibadan, regarding Health Information Systems (HIS) and their impact on patient care. The findings reveal a high level of knowledge among the pharmacists, suggesting a robust understanding of HIS and its potential benefits. The positive correlations between knowledge, attitude, and perception indicate that continued education and training can further enhance the effective use of HIS in practice. Despite this strong knowledge base, several barriers to the optimal utilization of HIS were identified, including insufficient training, lack of resources, inadequate funding, and limited access to modern technology. Addressing these challenges is crucial for maximizing the benefits of HIS in patient care. Effective communication and proactive engagement with patients about their health information are essential to ensure informed decision-making and improve patient outcomes. Pharmacists' perceptions of the benefits of HIS and their recognition of the need for additional training underscore the importance of integrating comprehensive education programs and resource allocation to overcome existing barriers. By addressing these issues, pharmacists can better utilize HIS to enhance patient care, promote public health, and support effective health management practices.

While pharmacists at UCH demonstrate a commendable level of knowledge and a positive attitude towards HIS, concerted efforts to overcome identified barriers and enhance training will be essential in leveraging HIS to its full potential. Future research should focus on exploring

strategies to address these barriers and evaluate the long-term impact of improved HIS utilization on patient care outcomes.

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