RESEARCH ARTICLE

Measurement of patient awareness of the critical role played by clinical pharmacists in Saudi Arabia's healthcare

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Abstract

Background: Clinical pharmacists play a crucial role in healthcare by ensuring safe and effective medication management, improving adherence, minimizing drug-related errors, and providing patient education. Despite their importance, public awareness of clinical pharmacists' contributions in Saudi Arabia remains limited. This study assesses patient awareness of clinical pharmacists' roles, identifies factors influencing awareness, and provides recommendations for improvement.

Methods: A quantitative, cross-sectional study was conducted using a structured online questionnaire distributed to 936 participants across Saudi Arabia. The questionnaire covered demographics, knowledge, awareness, trust, and willingness to learn about clinical pharmacists. Data were analyzed using SPSS v26.0, employing descriptive and inferential statistics, including chi-square tests and logistic regression.

Results: The majority of participants (88.4%) were aware of clinical pharmacists, with higher awareness among females (93%) than males (82.5%). Awareness varied significantly by age and education level (p<0.01). Trust in clinical pharmacists' advice increased with higher education levels. Most participants expressed willingness to learn more about clinical pharmacists, particularly those with chronic health conditions. Logistic regression identified gender and education as significant predictors of awareness, while trust was the strongest predictor of willingness to learn.

Conclusion: Although awareness of clinical pharmacists in Saudi Arabia is relatively high, knowledge gaps regarding their specific roles persist. Educational campaigns emphasizing role clarity, trust-building, and pharmacist-led public health initiatives are recommended to enhance public engagement and optimize healthcare outcomes. Future research should explore the long-term effects of targeted educational interventions on patient perceptions and behaviors.

Keywords: Clinical pharmacists, Patient awareness, Medication management, Public health, Saudi Arabia, Healthcare education, Trust, Cross-sectional study, Pharmacy services, Patient engagement

Introduction

Clinical pharmacists are essential in modern healthcare, collaborating with physicians, nurses, and patients to ensure safe and effective medication management. Their roles include improving medication adherence, minimizing drug-related errors, and providing patient education. However, despite their critical contributions, patient awareness of clinical pharmacists' roles remains limited. In Saudi Arabia, where healthcare has witnessed rapid advancements, understanding the public perception of clinical pharmacists can inform targeted initiatives to bridge knowledge gaps. This study investigates the awareness levels of patients regarding the role of clinical pharmacists in Saudi Arabia, focusing on factors influencing awareness and providing recommendations for improvement.

2000-2010

During this period, clinical pharmacy emerged as a recognized discipline within multidisciplinary healthcare systems. Studies demonstrated the significant role of clinical pharmacists in reducing medication errors, enhancing patient understanding of prescribed medications, and optimizing therapeutic outcomes. However, public awareness of these roles was found to be minimal, limiting the broader utilization of clinical pharmacy services (Alomi et al., 2022).

2011-2020

The following decade saw an expansion in the roles of clinical pharmacists, especially in areas such as medication therapy management (MTM), chronic disease management, and antimicrobial stewardship. Research highlighted the positive impacts of clinical pharmacists in reducing hospital readmissions and improving medication adherence (Alhur et al., 2024). Yet, despite these advancements, studies continued to emphasize the lack of sufficient patient education on the benefits of clinical pharmacists' interventions (Sakeena et al., 2019).

2021–Present

The integration of clinical pharmacists into healthcare systems in Saudi Arabia has grown considerably in recent years. Despite this progress, research indicates persistent gaps in public awareness of clinical pharmacists' roles (Bond et al., 2013). For instance, a study on public perspectives of digital innovations in pharmacy revealed optimism about digital tools in medication management but highlighted significant concerns about data privacy and usability, affecting their adoption (Alhur et al., 2024). These findings emphasize the need to align patient education on clinical pharmacists' roles with the evolving landscape of healthcare technologies.

Additionally, studies on antibiotic resistance and self-medication shed light on critical public health challenges that clinical pharmacists can address. For example, a nationwide survey on antibiotic resistance revealed that while 75.7% of respondents were aware of the issue, gaps in practice persisted, such as premature discontinuation of antibiotic courses (Alhur et al., 2024). Similarly, research on self-medication in Saudi Arabia found that 76% of respondents engaged in self-medication, underscoring the importance of accessible pharmacist-led education on safe medication practices (Alhur et al., 2024).

Further, research on vitamin literacy highlighted a discrepancy between public knowledge of vitamins and practical dietary application, showing a broader challenge in translating health knowledge into behavior (Alhabib et al., 2016). Clinical pharmacists, as medication and health educators, are well-positioned to address these challenges, reinforcing their critical role in patient-centered care.

Research objectives

- Assess patients' awareness of the clinical pharmacist's role in healthcare delivery in Saudi Arabia.
- Evaluate patients' understanding of the specific responsibilities carried out by clinical pharmacists.
- Identify factors such as age, education, and healthcare experience that influence patient awareness of clinical pharmacists.
- Provide recommendations for improving public awareness about the role of clinical pharmacists in healthcare.

Methods

Research design

This study adopted a quantitative, cross-sectional research design to evaluate patients' awareness of clinical pharmacists in Saudi Arabia. This approach allowed for a systematic assessment of awareness levels, perceptions, and influencing factors, providing actionable insights for enhancing public knowledge and shaping public health interventions.

Population and sampling

The target population included adults aged 18 years and older who had interacted with healthcare services across Saudi Arabia. The study utilized a random sampling technique to ensure a representative sample. A total sample size of at least 1,000 respondents was determined based on established statistical guidelines to achieve a high level of confidence and statistical power. Efforts were made to include participants diverse in age, education, gender, and socioeconomic backgrounds, ensuring the findings are generalizable to the broader population.

Data collection

Data were gathered through a structured online questionnaire designed in collaboration with healthcare and pharmacy experts. The questionnaire comprised five sections:

Demographics: Information on gender, age, education level, and chronic health conditions.

Knowledge: Assessment of familiarity with clinical pharmacists and their roles.

Awareness: Perceptions of the significance and contributions of clinical pharmacists in healthcare.

Trust: Levels of trust in advice provided by clinical pharmacists and confidence in information sources.

Willingness: Interest in learning more about clinical pharmacists and their roles.

The questionnaire was pretested to ensure clarity, reliability, and validity. It was distributed via social media platforms, patient portals, and healthcare networks to maximize accessibility and inclusivity. Participants were required to provide informed consent before proceeding with the survey.

Data analysis

All collected data were analyzed using SPSS version 26.0. The analysis was conducted in two phases:

Descriptive statistics: Frequencies, percentages, means, and standard deviations were used to summarize demographic characteristics and awareness levels.

Inferential statistics: Chi-square tests were employed to examine relationships between categorical variables, such as gender, age, and education level, and awareness or trust in clinical pharmacists. Logistic regression analyses were performed to identify significant predictors of awareness and willingness to learn more about clinical pharmacists.

Ethical considerations

This study has been reviewed and approved by the Research Ethics Committee (REC) at University of Hail, under approval number H-2024-394. Informed consent was obtained electronically from all participants, with assurances of anonymity and confidentiality. Data were used exclusively for research purposes and stored securely to protect participant privacy. Participants were informed that their involvement was voluntary, with the option to withdraw at any time without consequence.

Results

The survey included a total of 936 participants, with 41.5% being male and 58.5% female. The largest age group was 25 years-34 years (39.4%), followed by 18 years-24 years (35.5%), 35 years-44 years (21.2%), and 45 years and above (4.1%).

Regarding education level, most participants held a bachelor's degree (56.8%), followed by a master's degree (18.7%), high school education (11.5%), PhD (6.6%), and diploma (6.6%). Additionally, 34.4% reported having chronic health conditions requiring regular medication, while 65.6% did not (Tab. 1).

Table 1. Demographic information analysis.

Variable	Category	Frequency	Percentage (%)
Gender	Male	388	41.5
	Female	548	58.5
Age (Years)	18-24	332	35.5
	25-34	368	39.4
	35-44	198	21.2
	45 and above	38	4.1
Education Level	High school	108	11.5
	Diploma	62	6.6
	Bachelor's degree	530	56.8
	Master's degree	174	18.7
	PhD	62	6.6
Chronic Conditions	Yes	322	34.4
	No	614	65.6

Most respondents (88.4%) had heard of clinical pharmacists, while 11.6% had not. Regarding differences from retail/community pharmacists, 72.2% believed clinical pharmacists were different, 12.6% did not, and 15.1% were unsure. Respondents identified the roles of clinical pharmacists as advising physicians on medication choices (31%), counseling patients on medication use (22.5%), monitoring patient responses to medications (19.3%), dispensing medications (15%), and conducting research (12.8%) (Tab. 2).

Table 2. Knowledge of clinical pharmacists.

Question	Category	Frequency	Percentage (%)
Have you heard of clinical pharmacists?	Yes	830	88.4
	No	106	11.6
Difference from retail/community pharmacists?	Yes	678	72.2
	No	118	12.6
	Not sure	142	15.1
Roles of clinical pharmacists	Dispense medications	140	15
	Advise physicians on medication choices	290	31
	Counsel patients on medication use	210	22.5
	Monitor patient responses to medication	180	19.3
	Conduct research	120	12.8

Among males, 320 (82.5%) had heard of clinical pharmacists, while 68 (17.5%) had not. Among females, 510 (93%) had heard of clinical pharmacists, while 38 (7%) had not. This indicates a higher awareness among females (Tab. 3).

Comparative analysis

Table 3. Gender *vs.* Awareness of clinical pharmacists.

Gender	Heard of Clinical Pharmacists: Yes	Heard of Clinical Pharmacists: No
Male	320	68
Female	510	38

Awareness of clinical pharmacists varied by age group. The highest awareness was among those aged 25 years-34 years (350 aware, 18 not aware), followed by 18 years-24 years (290 aware, 42 not aware). Awareness was lower among participants aged 35 years-44 years (160 aware, 38 not aware) and 45 years and above (30 aware, 8 not aware) (Tab. 4).

Table 4. Age *vs.* Awareness of clinical pharmacists.

Age Group(Years)	Heard of Clinical Pharmacists: Yes	Heard of Clinical Pharmacists: No
18-24	290	42
25-34	350	18
35-44	160	38
45 and above	30	8

Trust in clinical pharmacist advice increased with education level. Among participants with a bachelor's degree, 450 trusted clinical pharmacists, 30 did not, and 50 were unsure. Similarly, 150 participants with a master's degree trusted clinical pharmacists, 10 did not, and 14 were unsure. Trust was lowest among high school educated respondents (90 trusted, 12 did not, 6 unsure) (Tab. 5).

Table 5. Education Level *vs.* Trust in clinical pharmacist advice.

Education Level	Trust: Yes	Trust: No	Not Sure
High school	90	12	6
Diploma	40	10	12
Bachelor's degree	450	30	50
Master's degree	150	10	14
PhD	60	2	0

Among participants with chronic conditions, 308 (95.7%) expressed willingness to learn more about clinical pharmacists, while 14 (4.3%) were not willing. For those without chronic conditions, 688 (93.7%) were willing, and 46 (6.3%) were not (Tab. 6).

Table 6. Chronic Conditions *vs.* Willingness to learn more.

Chronic Condition	Willing to Learn: Yes	Willing to Learn: No
Yes	308	14
No	688	46

Significant associations were observed for:

Gender *vs.* Awareness of Clinical Pharmacists: $\chi^2 = 9.737$, p = 0.0018.

Age *vs.* Awareness of Clinical Pharmacists: $\chi^2 = 75.266$, p < 0.0001.

Education Level *vs.* Trust in Clinical Pharmacist Advice: $\chi^2 = 20.611$, p = 0.0083. No significant association was found for chronic conditions *vs.* willingness to learn more ($\chi^2 = 1.201$, p = 0.2731) (Tab. 7).

Table 7. Chi-square test results.

Comparison	Chi-Square Statistic	p-Value	Degrees of Freedom	Interpretation

Gender *vs.* Awareness of Clinical Pharmacists	9.737	0.0018	1	Significant association
Age *vs.* Awareness of Clinical Pharmacists	75.266	< 0.0001	3	Highly significant association
Education Level *vs.* Trust in Clinical Pharmacist Advice	20.611	0.0083	8	Significant association
Chronic Conditions *vs.* Willingness to Learn More	1.201	0.2731	1	No significant association

Logistic regression analysis showed that gender and education level were significant predictors of awareness of clinical pharmacists. Females were less likely to be aware (Coef.= -0.780, p=0.0015), while higher education levels increased awareness (Coef.= 0.342, p=0.015). Chronic conditions were not a significant predictor (Coef.= -0.190, p=0.460) (Tab. 8).

Table 8. Logistic regression results: Predictors of awareness.

	Coef.	Std.Err.	z	P>|z|	[0.025	0.975]
Const.	0.540046	0.305477	1.767881	0.077081	-0.05868	1.138769
Gender_Binary	-0.78007	0.246008	-3.17091	0.00152	-1.26224	-0.2979
Chronic_Condition_Binary	-0.18959	0.256566	-0.73896	0.459931	-0.69245	0.313268
Education_Level_Numeric	0.34208	0.140245	2.439162	0.014721	0.067205	0.616955

The model identified trust in clinical pharmacists as the strongest predictor of willingness to learn (Coef. =2.948, p<0.0001). Gender (female) also significantly increased willingness to learn (Coef. =1.402, p=0.016). Awareness of clinical pharmacists and education level were not significant predictors (p=0.227 and p=0.438, respectively) (Tab. 9).

Table 9. Logistic regression results for predictors of willingness to learn about clinical pharmacists.

	Coef.	Std.Err.	z	P>|z|	[0.025	0.975]
Const.	-0.08067	0.617548	-0.13063	0.896069	-1.29104	1.129703
Awareness_Binary	0.802626	0.665308	1.206399	0.227664	-0.50135	2.106605
Trust_Binary	2.94844	0.627845	4.69613	2.65E-06	1.717888	4.178993
Gender_Binary	1.401905	0.582781	2.405543	0.016148	0.259675	2.544135
Education_Level_Numeric	-0.19159	0.247063	-0.77547	0.438065	-0.67582	0.292646

The logistic regression model analyzing predictors of willingness to learn about clinical pharmacists is visualized in the accompanying chart. The chart displays the coefficients of the predictors along with their 95% confidence intervals. Predictors with confidence intervals that do not cross the red vertical line at zero are statistically significant. Positive coefficients indicate predictors that increase the likelihood of willingness to learn, while negative coefficients indicate predictors that decrease this likelihood. This visualization provides a summary of the statistical significance and effect sizes of the predictors (Fig. 1).
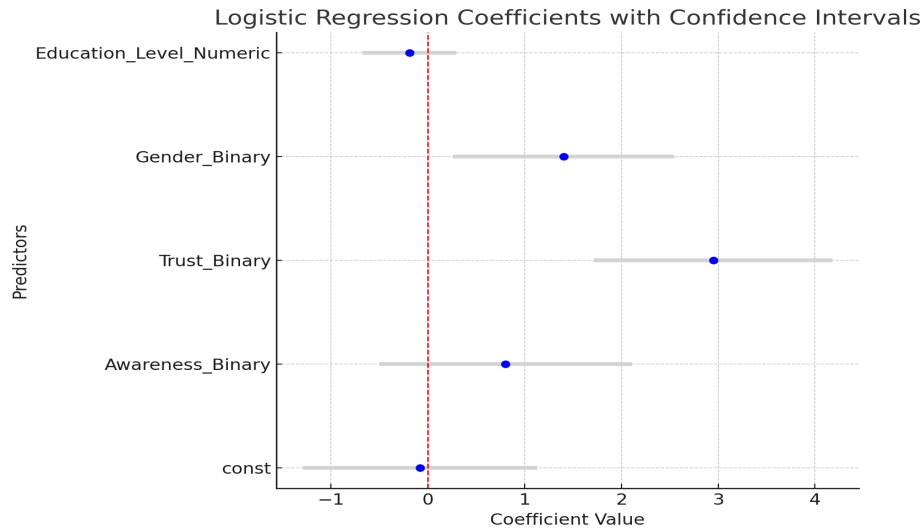
Logistic Regression Coefficients with Confidence Intervals

Figure 1. Logistic regression coefficients with confidence intervals.

Discussion

This study explored the awareness, knowledge, trust, and willingness of patients in Saudi Arabia to learn about the role of clinical pharmacists in healthcare. The findings provide valuable insights into the public's perceptions and the factors influencing their understanding of clinical pharmacists' contributions.

Awareness and knowledge of clinical pharmacists

The high awareness levels among participants reflect the growing visibility of clinical pharmacists in Saudi Arabia's healthcare system. However, gaps in detailed understanding of their roles persist. Similar studies have reported that while clinical pharmacists are recognized for their presence in healthcare settings, their specific contributions, such as medication management and patient counseling, are often underappreciated (Alomi et al., 2022; Alhur et al., 2024). Public health campaigns emphasizing these roles may bridge this gap.

The differentiation between clinical pharmacists and retail or community pharmacists was acknowledged by most participants, which aligns with findings in other healthcare systems where distinct roles are emphasized (Sakeena et al., 2019). Nevertheless, efforts to increase clarity about these differences remain critical to enhancing patient engagement with clinical pharmacy services.

Trust in clinical pharmacists

The strong trust expressed by participants in clinical pharmacists' advice underscores their perceived reliability as healthcare providers. This trust is consistent with prior studies, which found that patients often view clinical pharmacists as knowledgeable and approachable professionals who enhance medication safety (Bond et al., 2013; Alhur et al., 2024). However, trust was positively correlated with higher education levels, indicating the need for targeted awareness campaigns to build trust among less educated populations.

Influence of demographics

Gender and education level were significant predictors of awareness and willingness to learn more about clinical pharmacists. Females were less likely to report awareness, a finding that aligns with studies highlighting gender-based disparities in health information access (Alhur et al., 2024). Education emerged as a crucial factor, with higher levels of education associated with greater awareness and trust. These findings emphasize the importance of tailoring educational initiatives to reach underserved demographic groups effectively.

Chronic conditions and engagement

Participants with chronic health conditions demonstrated a slightly higher willingness to learn about clinical pharmacists, likely reflecting their increased interaction with the healthcare system. This aligns with prior research suggesting that patients with chronic illnesses are more motivated to seek information about their healthcare providers and treatments (Alhabib et al., 2016; Alhur et al., 2024). However, the lack of a significant statistical association between chronic conditions and willingness to learn highlights the need for broader public outreach efforts.

Implications for practice and policy

The findings underscore the need for systematic efforts to enhance public knowledge about clinical pharmacists. Educational initiatives should focus on:

Role clarification: Emphasizing the unique contributions of clinical pharmacists in medication management and patient counseling.

Building trust: Addressing demographic disparities to foster trust among diverse populations.

Integrating pharmacists in public health campaigns: Leveraging media and community outreach to showcase the value of clinical pharmacy services.

Furthermore, these insights can guide policymakers in integrating clinical pharmacists more prominently in healthcare delivery and public health strategies. Collaborative efforts between healthcare institutions and policymakers are essential to maximize the impact of clinical pharmacy services.

Limitations and Future Research

This study had some limitations. The use of an online questionnaire may have excluded individuals without internet access, potentially limiting the generalizability of the findings. Additionally, self-reported data may introduce bias due to respondents' perceptions and recall accuracy.

Future research should explore longitudinal designs to assess changes in awareness and trust over time. Investigating the impact of targeted educational interventions on awareness and engagement with clinical pharmacists could provide actionable strategies for enhancing their role in healthcare.

Conclusions

This study highlights significant gaps in public awareness and understanding of clinical pharmacists' roles, despite high levels of trust in their advice. By addressing these gaps through targeted education and outreach, healthcare systems in Saudi Arabia can improve patient engagement with clinical pharmacy services, ultimately enhancing healthcare outcomes.

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