

RESEARCH ARTICLE

Wound care practices and training needs among community pharmacists in Saudi Arabia: a cross-sectional study

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Abstract

Background Community pharmacists play a vital role in primary care, including minor wound management. However, their formal training and involvement in wound care in Saudi Arabia remains underexplored.

Objective This study aimed to assess the current practices, knowledge and training needs related to wound care among community pharmacists in Saudi Arabia.

Methods A cross-sectional survey was conducted among licensed community pharmacists across several regions in Saudi Arabia during September 2024. A self-administered questionnaire was used to collect data on demographics, wound care experience, confidence levels and preferred training methods. Descriptive statistics and chi-square tests were applied.

Results Of the 203 respondents, most were male (71.9%) and had 1–3 years of experience. While 62% encountered wound cases sometimes or rarely, 96% reported no formal wound care training. Pharmacists expressed interest in certified workshops and practical courses. A significant association was observed between training and confidence in providing wound care recommendations ($p < 0.01$).

Conclusion Community pharmacists in Saudi Arabia are moderately involved in wound care but lack structured training. Enhancing their role through interprofessional collaboration and targeted education may improve patient-centered wound management.

Keywords community pharmacy, wound management, wound care, chronic wounds, Saudi Arabia.

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Introduction

Effective management of both acute and chronic wounds requires timely assessment, appropriate selection of wound care products, patient education, and when necessary, prompt referral to specialised care. While acute wounds often heal predictably with appropriate care, the development of chronic wounds, such as venous leg ulcers, arterial insufficiency ulcers, diabetic foot ulcers, and pressure ulcers, presents significant challenges.^{1,2} These chronic wounds are characterised by a sustained inflammatory response that impedes healing.³ Worldwide, the rising burden of these wounds is leading to increased pressure on healthcare systems and a decline in patients' quality of life.⁴ The growing impact of an aging population, increasing comorbidities, and declining skin integrity highlights the need for timely and

effective wound care.⁵ Addressing this complex challenge necessitates a holistic strategy involving an interprofessional team centered on patient needs, where the contributions of various healthcare professionals are essential.⁶

Pharmacists, with their extensive knowledge of medications and treatments, can play a crucial role in advising patients on the appropriate wound care products and methods.⁷ They are often the first point of contact for patients with minor wounds and can provide essential care and guidance, and also involved in assessing wounds, recommending appropriate over-the-counter treatments, and providing patient education on wound care.⁸ Furthermore, pharmacists can identify the severity of wounds and refer patients to specialised care when necessary, ensuring timely

interventions.⁹ Therefore, their role is crucial in ensuring effective wound management and preventing complications. Overall, their role is multifaceted and within the scope of their competency.¹⁰

Despite their critical role, pharmacists face several challenges in providing advanced wound care. Barriers include limited training in wound care, lack of standardised protocols, and time constraints due to high workloads in community pharmacy settings.¹¹ Studies also highlight gaps in pharmacists' knowledge regarding advanced wound management techniques and the latest treatments.¹² Addressing these gaps through training programs and continuing education is essential to enhance their expertise and ensure they remain updated on current practices.¹³ In addition, pharmacist's perceptions of their role in wound management can influence their practice. Studies show that pharmacists often perceive themselves as key players in managing minor wounds but may feel less confident handling more complex cases.⁸ Perceptions of their role and the level of involvement can vary based on individual experience, training, and the resources available in their community pharmacy setting.¹⁴ Addressing these challenges is crucial for optimising pharmacists' contributions to wound care in community settings.

Although the role of community pharmacists in wound management is promising, literature specifically addressing this within the context of Saudi Arabia is limited. Challenges, such as insufficient time for patient counselling and lack of access to advanced wound care products, further complicate the situation. This study aims to investigate the knowledge, attitudes, practices and contributing factors influencing community pharmacists' involvement in wound care in Saudi Arabia, addressing a critical gap in the literature and paving the way for improved practices in this vital area of healthcare.

Methods

Study design and setting

A cross-sectional study was conducted from September to December 2024 among 378 community pharmacists practicing in Saudi Arabia. Pharmacists from various regions across the country were recruited to ensure the generalisability of the findings. The inclusion criteria required participants to be licensed pharmacists actively working in community pharmacy settings.

Study population and inclusion criteria

The target population included licensed community pharmacists actively working in community pharmacy settings in Saudi Arabia at the time of data collection. Pharmacists of any nationality were eligible for inclusion. Individuals who were not licensed or not currently practicing in a community pharmacy were excluded.

Participant recruitment

Participants were recruited using a combination of purposive

and convenience sampling strategies to capture a diverse and representative sample. Recruitment was facilitated through professional pharmacy networks, social media platforms, and direct outreach to community pharmacies. Pharmacists were invited to participate voluntarily, and informed consent was obtained before survey administration.

Sample size calculation

According to the most recent statistical data from the Ministry of Health (MOH), there are 21,648 community pharmacists working across 10,347 pharmacies in Saudi Arabia.¹⁵ Based on a 95% confidence level, a 5% margin of error, and an estimated population proportion of 50%, the required sample size was calculated to be approximately 378 participants using a standard sample size formula for proportions.

Research instrument

A structured questionnaire was developed to assess pharmacists' knowledge of wound care, their attitudes toward providing wound management services, and the factors influencing their involvement in such services. The survey was validated for face and content validity by a panel of five experts in pharmacy practice and wound care. A pilot study with 20 community pharmacists was conducted to test the clarity and comprehensibility of the questionnaire. Feedback from the pilot was used to revise the wording, structure, and layout of the survey to improve clarity and reliability.

Data collection

Data were collected using a validated structured survey administered both online and in person within community pharmacy settings. The questionnaire comprised multiple-choice questions to evaluate pharmacists' knowledge of wound care practices, Likert scale items (ranged from "Strongly Disagree" to "Strongly Agree") to assess their attitudes and perceptions toward wound care services, and open-ended questions were used to gather qualitative insights into their experiences and views. Participation was voluntary, and informed consent was obtained from all respondents prior to completing the survey.

Statistical analysis

Data were analysed using SPSS software. Descriptive statistics (frequencies, means, and standard deviations) were used to summarise demographic characteristics and survey responses. Inferential statistics, including Chi-square tests and univariate regression analyses, were employed to explore associations between pharmacists' characteristics and their knowledge or perceptions of wound care. A p-value of <0.05 was considered statistically significant. Visual representations of the data (graphs) were created using Microsoft Excel.

Results

Demographic characteristics

Out of the calculated sample size of 387 participants, only

337 responded, resulting in a response rate of 87.1%. Table 1 outlines the demographic characteristics of the participants, showing a statistically significant distribution ($p < 0.05$) across all categories. The sample was predominantly male (82.5%); however, 17.5% of females also participated in the study, and most of the participants were young adults aged 25–34

(65.9%). Most participants held a bachelor's degree (95.3%) and were primarily of Egyptian nationality (55.2%), 44.5% were Saudis, while 0.3% (one participant) was Yemeni. Most of the cohort had 1–3 years of experience (42.7%) and worked as community pharmacists (90.2%). Chain pharmacies were the most common workplace (71.5%), with the highest

Table 1. Demographic characteristics of study participants (N=337).

Variables	n	Percentage	p-value
Sex			
Male	278	82.5	<0.05
Female	59	17.5	
Age (years)			
<25	29	8.6	<0.05
25–34	222	65.9	
35–44	80	23.7	
45–54	5	1.5	
≥55	1	0.3	
Education			
Bachelor's degree	321	95.3	<0.05
Diploma	15	4.5	
Doctorate	1	0.3	
Nationality			
Saudis	150	44.5	<0.05
Egyptian	186	55.2	
Yemeni	1	0.3	
Experience (Years)			
<1	60	17.8	<0.05
1–3	144	42.7	
4–6	96	28.5	
>6	37	11	
Current role (N=323)			
Community pharmacist	304	90.2	<0.05
Pharmacy students/ interns	17	5	
Community pharmacy owner	2	0.6	
Pharmacy type			
Independent pharmacy	38	11.3	<0.05
Chain pharmacy	241	71.5	

Variables	n	Percentage	p-value
Hospital-based pharmacy	55	16.3	<0.05
Others	3	0.9	
Practising regions			
Hail	75	22.3	<0.05
Al-Jouf	7	2.1	
Al-Riyadh	147	43.6	
Eastern province	21	6.2	
Al-Bahah	1	0.3	
Jazan	9	2.7	
Makkah	25	7.4	
Najran	5	1.5	
Northern borders	5	1.5	
Madinah	16	4.7	
Qassim	13	3.9	
Tabuk	7	2.1	
Asir	6	1.8	
Pharmacy location			
City	286	84.9	<0.05
Town	35	10.4	
Remote area	16	4.7	
Encounter wound related cases			
Often	61	18.1	<0.05
Rarely	32	9.5	
Always	63	18.7	
Sometimes	177	52.5	
Never	4	1.2	
Received formal training in wound care			
Yes	12	3.6	<0.05
No	325	96.4	

concentration of participants practicing in Al-Riyadh (43.6%). Most pharmacies were located in cities (84.9%), and 52.5% of the participants sometimes encountered wound-related cases. Notably, only 3.6% had received formal wound care training, highlighting a gap in this area.

Knowledge of wound management

Table 2 presents the self-assessed knowledge of wound management among the participants. Overall knowledge was rated as fair (45.4%) or good (40.7%) by most participants, with only 11.3% rating their knowledge as excellent. Knowledge of 'wound types and management' and 'infection control' followed a similar pattern, with the majority rating their knowledge as fair or good, and less than 15% rating it as excellent. Participants reported stronger knowledge of dressing types and use (51.3% rated good). Pain management and referral processes were areas of relative weakness, with a substantial proportion of participants rating their knowledge as poor or very poor.

Attitudes and perceptions regarding wound care

Table 3 summarises participants' attitudes and perceptions regarding wound care. A strong majority of participants agreed or strongly agreed that pharmacists should be involved in wound care (over 75%), that pharmacists can play a proactive role, and that pharmacist involvement can lead to improved patient outcomes. There was also strong support (91% agreement) for including wound care education in pharmacy curricula. Most participants (77.7%) reported using a combination of sources to improve their wound care knowledge. All items had a p-value of <0.05, indicating statistical significance.

Participants expressed a strong belief in the influence of their wound care knowledge on their practice. A high percentage agreed or strongly agreed that their knowledge influenced patient care decisions, and a similar proportion

believed that short courses enhance their selection of wound care products. Conversely, a substantial proportion acknowledged that their current knowledge limits the wound care services they can provide.

Factors motivating engagement in wound care

Table 4 presents the factors motivating pharmacists' engagement in wound care. The most frequently cited motivating factors were improving patients' healing rates, achieving sales targets for wound care products, and receiving positive feedback from patients. Building strong patient relationships and collaborating with local healthcare providers were also identified as important motivators. All items had a p-value of <0.05, indicating statistical significance.

Challenges to pharmacist involvement in wound care

Table 5 outlines the challenges affecting pharmacists' involvement in wound management. The most frequently reported challenges included limited facilities, time constraints, and difficulties in accessing detailed patient information. Lack of specialised training, poorly defined guidelines, and insufficient access to advanced wound care products were also identified as significant barriers. All items had a p-value of <0.05, indicating statistical significance.

Factors influencing engagement and knowledge

Table 6 presents the results of the ANOVA examining factors influencing pharmacist engagement and knowledge in wound management. The corrected model explained a small but significant portion of the variance ($R^2=0.058$, $p=0.001$). Practicing experience ($p=0.004$) and age ($p=0.017$) were significantly associated with engagement and knowledge, with more experienced and older pharmacists demonstrating greater knowledge and engagement. Nationality, sex, and education were not significantly associated with engagement and knowledge.

Table 2. Self-assessed knowledge of wound management among community pharmacists (N=337)

Knowledge	Fair n(%)	Good n(%)	Excellent n(%)	Poor n(%)	Very Poor n(%)	p-value
Overall knowledge	153(45.4)	137(40.7)	38(11.3)	9(2.7)	0(0)	<0.05
Wound types and management	134(39.8)	103(30.6)	52(15.4)	45(13.4)	3(0.9)	<0.05
Infection control	158(46.9)	103(30.6)	17(5.0)	52(15.4)	7(2.1)	<0.05
Dressing types and use	93(27.6)	173(51.3)	44(13.1)	22(6.5)	5(1.5)	<0.05
Pain management	143(42.4)	110(32.6)	21(6.2)	49(14.5)	14(4.2)	<0.05
Referral processes	119(35.3)	121(35.9)	12(3.6)	57(16.9)	28(8.3)	<0.05

Table 3. Pharmacists' attitudes and perceptions regarding wound care (N=337)

Attitudes and perceptions	Strongly agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)	Strongly disagree n(%)
Knowledge influences patient care	125(37.1)	171(50.7)	34(10.1)	4(1.2)	3(0.9)
Short courses enhance selection of wound care products	212(62.9)	114(33.8)	11(3.3)	0(0)	0(0)
Knowledge limits wound care services	138(40.9)	116(34.4)	61(18.1)	18(5.3)	1(0.3)
Satisfaction with current knowledge	8(2.4)	26(7.7)	198(85.8)	67(19.9)	38(11.3)
Addition of wound care topics in pharmacy curriculum	153(45.4)	139(41.2)	43(12.8)	2(0.6)	0(0)
Interest in wound care training	191(56.7)	130(38.6)	15(4.5)	1(0.3)	0(0)
Pharmacist involvement in wound care is needed	137(40.7)	119(35.3)	27(8)	5(1.5)	48(14.2)
Pharmacist can play a proactive role in wound care	208(61.7)	99(29.4)	14(4.2)	7(2.1)	8(2.4)
Pharmacist involvement improves patient outcomes	213(63.2)	110(32.6)	9(2.7)	3(0.9)	1(0.3)
Integrate wound care into pharmacy curriculum	175(51.9)	132(39.2)	18(5.3)	7(2.1)	5(1.5)
Other healthcare professionals can replace pharmacists in wound care	11(3.3)	12(3.6)	53(15.7)	169(50.1)	88(26.1)
Training enhances pharmacist wound care involvement	192(57)	115(34.1)	11 (3.3)	9 (2.7)	10(3)
Resources enable expanded pharmacist wound care services	153(45.4)	137(40.7)	27 (8)	13(3.9)	7(2.1)
The wound care market is profitable	190(56.4)	105(31.2)	25(7.4)	11(3.3)	6(1.8)

Preferred training topics

Figure 1 illustrates the wound care topics pharmacists were interested in learning more about. Chronic wound care management, acute wound care management, and pain management were the most frequently selected topics. Other areas of interest included infection control and prevention, wound care guidelines, patient education, new wound care products, and collaboration with other healthcare professionals.

Methods for training

Figure 2 shows the preferred training methods to enhance pharmacist involvement in wound management. Hands-on workshops and certification programs were the most favored approaches. Online courses, continuing education seminars, and interactive case studies were moderately popular.

Simulation exercises and peer learning/group discussions were less frequently selected. Most participants expressed a preference for a combination of training methods.

Discussion

This study investigated the knowledge, attitudes, and practices of community pharmacists regarding wound care in Saudi Arabia. Our findings indicate that while most pharmacists demonstrate fair to good knowledge across various wound care domains, important gaps remain particularly in pain management and referral processes. This highlights the need for targeted training to address these specific knowledge deficits. These findings align with other studies, including a study in Jordan, where pharmacists showed good knowledge of wound management but reported

Table 4. Factors motivating pharmacists' engagement in wound care (N=337)

Motivating factor	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Improving patient healing	205(60.8)	116(34.4)	16(4.7)	0(0.0)	0(0.0)
Achieving wound care sales targets	207(61.4)	118(35.0)	12(3.6)	0(0.0)	0(0.0)
Receiving positive feedback from patients	163(48.4)	160(47.5)	14(4.2)	0(0.0)	0(0.0)
Joining the wound care community	27(8.0)	166(49.3)	130(38.6)	11(3.3)	3(0.9)
Building patient relationships as a wound care expert	27(8.0)	184(54.6)	123(36.5)	3(0.9)	0(0.0)
Collaborating with local healthcare providers	39(11.6)	185(54.9)	106(31.5)	7(2.1)	0(0.0)
Promoting pharmacist role in wound care	72(21.4)	132(39.2)	133(39.5)	0(0.0)	0(0.0)
Leading new wound care services	73(21.7)	111(32.9)	152(45.1)	1(0.3)	0(0.0)

Table 5. Challenges affecting involvement of pharmacists in wound management (N=337)

Challenges	Strongly agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)	Strongly disagree n(%)
Lack of specialised training	74(22)	145(43)	118(35)	0(0)	0(0)
Limited space/facilities	107(31.8)	173(51.3)	55(16.3)	2(0.6)	0(0)
Time constraints	152(45.1)	127(37.7)	55(16.3)	2(0.6)	0(0)
Difficulty accessing patient data	119(35.3)	155(46)	49(14.5)	12(3.6)	2(0.6)
Lack of clear guidelines	105(31.2)	163(48.4)	68(20.2)	0(0)	0(0)
Limited regulatory support for wound care	100(29.7)	168(49.9)	67(19.9)	0(0)	1(0.3)
Difficulty coordinating with healthcare providers	143(42.4)	169(50.1)	22(6.5)	1(0.3)	0(0)
Low patient awareness of wound care services	34(10.1)	106(31.5)	164(48.7)	33(9.8)	0(0)
Lack of managerial support	147(43.6)	145(43)	44(13.1)	1(0.3)	0(0)
Limited access to advanced wound care products	70(20.8)	131(38.9)	128(38)	7(2.1)	1(0.3)

Table 6 presents ANOVA examining factors affecting pharmacist engagement and knowledge in wound management

Source	Sum of squares	df	Mean Square	F	Sig.
Corrected model	11.549*	5	2.31	4.07	0.001
Intercept	9.633	1	9.63	17	0.000
Practising experience	4.764	1	4.76	8.40	0.004
Age	3.250	1	3.25	5.73	0.017
Nationality	0.423	1	0.42	0.74	0.388
Sex	1.112	1	1.11	1.96	0.162
Education	0.207	1	0.20	0.36	0.546

*R Squared = 0.058 (Adjusted R Squared = 0.044)

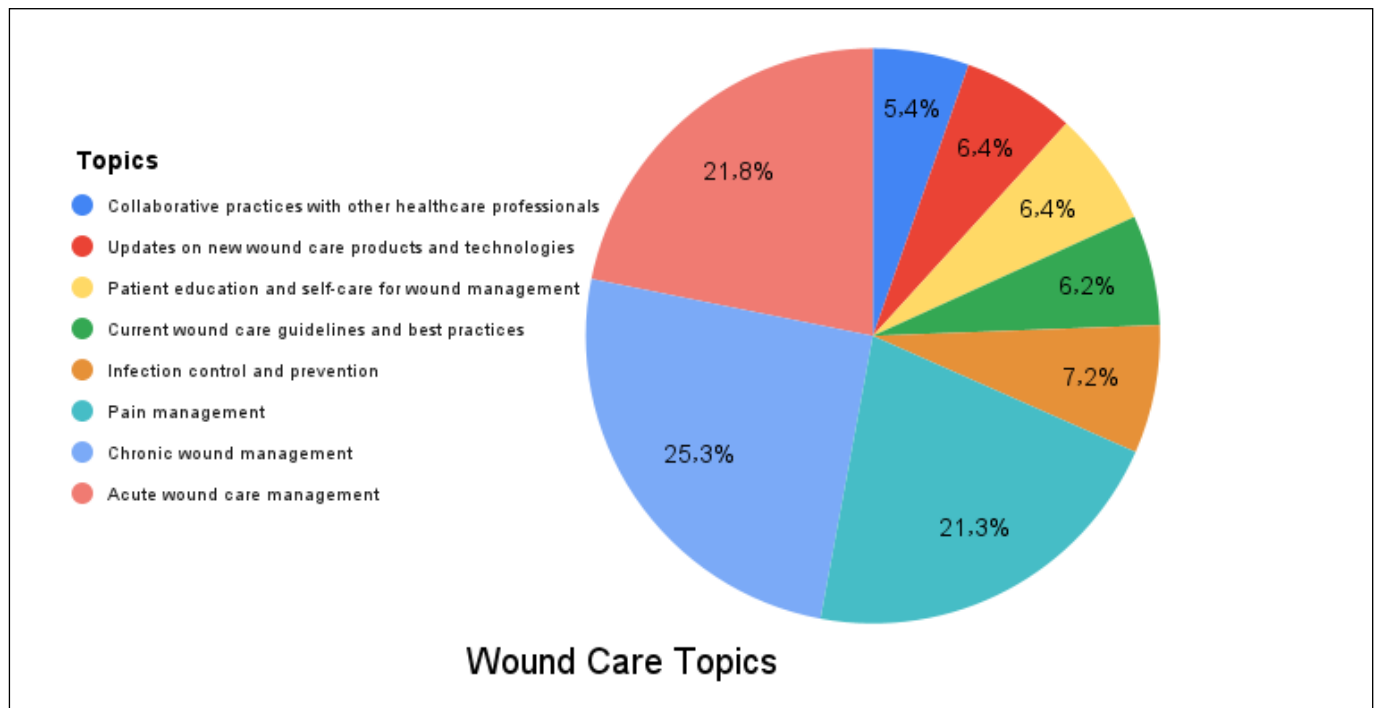


Figure 1. Wound care topics pharmacists seek to enhance their involvement in wound management

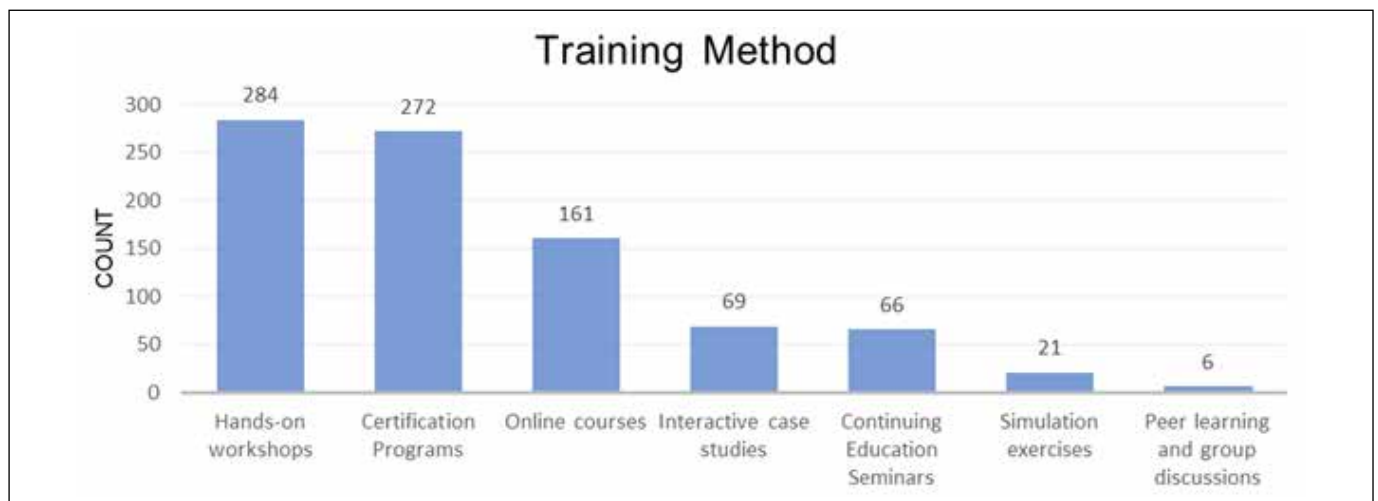


Figure 2. Preferred training methods to enhance pharmacist involvement in wound management

a lack of skills in dealing with wounds.¹¹ Similarly, research in the UAE found that 43% of pharmacists rated their wound care knowledge as fair or poor, highlighting a regional trend of suboptimal preparedness among pharmacists.¹²

In addition to assessing knowledge, this study also explored pharmacists' attitudes and actual practices, offering a more comprehensive understanding of their readiness to participate in wound care. A considerable number of participants expressed dissatisfaction with their current level of knowledge and a strong interest in further education. These findings mirror observations in other pharmacy practice areas, such as diabetes management and immunisation—where pharmacists frequently acknowledge knowledge gaps but demonstrate a strong willingness to expand their roles and clinical competencies.^{16,17}

The study found that experience and age significantly influenced pharmacist engagement and knowledge in wound care. This is consistent with previous literature suggesting that more experienced pharmacists often possess greater clinical confidence and competence.¹⁸ In contrast, demographics, such as nationality, sex, and education, did not significantly impact engagement and knowledge in this study, further research may be needed to explore these factors in more detail.

The majority of pharmacists expressed positive attitudes towards expanding their role in wound care, recognising its potential to enhance patient outcomes. Participants recognised the potential of their involvement to improve patient outcomes, a view supported by studies involving other healthcare professionals. For example, nurses and general practitioners who receive wound care training have shown improved patient satisfaction and healing outcomes.¹⁹ By comparison, pharmacists are still an underutilised resource in wound care, despite being among the most accessible healthcare professionals.

The commonly cited barriers of limited facilities, time constraints, and restricted access to patient data not only impede pharmacist involvement in wound care but also resonate with similar challenges encountered a recent study on the implementation of a clinical pharmacist-driven comprehensive medication management program in an outpatient wound healing center.⁷ These findings indicate the need for systemic support, such as policy changes and infrastructure improvements, to facilitate more active pharmacist participation in wound care

Hands-on workshops and certification programs emerged as the most preferred training methods, indicating a strong preference for practical, experiential learning and formal recognition of acquired skills. This is in line with global trends in healthcare education, where blended learning approaches combining face-to-face and online methods have been shown to enhance knowledge retention and clinical application.²⁰ A systematic review of educational interventions in wound

care supports the effectiveness of such blended models, particularly when they include interactive and case-based elements.²¹

This study has several limitations. The cross-sectional design limits the ability to establish causal relationships between variables. Additionally, the reliance on self-reported data may be subject to recall bias and social desirability bias. Furthermore, the findings may not be fully generalisable to all community pharmacists in Saudi Arabia, nor to other countries with differing healthcare systems.

Conclusions

This study provides valuable insights into the current state of wound care knowledge and practice among community pharmacists in Saudi Arabia. Key findings reveal significant knowledge gaps, particularly in pain management and referral processes. To enhance pharmacist involvement in wound care, targeted training programs incorporating preferred methods, such as hands-on workshops and blended learning approaches, are crucial. Addressing systemic barriers, such as limited facilities and time constraints, is essential. Fostering interprofessional collaboration is vital for optimising patient outcomes. Future research should explore the impact of training interventions on pharmacist knowledge, attitudes, and practices through longitudinal studies. Qualitative research methods, such as interviews and focus groups, can provide deeper insights into the challenges and facilitators of pharmacist involvement in wound care. Economic evaluations can assess the cost-effectiveness of pharmacist-provided wound care services. Additionally, exploring regional variations in pharmacist knowledge, attitudes, and practices regarding wound care is crucial for a comprehensive understanding of this critical area.

Conflict of interest

The author declares no conflicts of interest

Ethics statement

This study received approval from the Research Ethics Committee at the University of Hail (Approval No: H-2024-409). Informed consent was obtained from all participants before they took part in the survey. Participants were made aware that their involvement in the study was entirely voluntary.

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