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Research Article

Community pharmacists' awareness, attitudes, and confidence regarding opioid abuse and naloxone use in Kosova: A cross-sectional survey

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Abstract

Background: Evidence on community pharmacy professionals' involvement and preparedness to address opioid misuse and related harm in Kosova remains limited. This study assessed their awareness, attitudes, and self-reported confidence regarding opioid abuse and naloxone use.

Methods: A cross-sectional online survey was conducted among 460 community pharmacy professionals across Kosova using a structured online questionnaire.

Results: Participants reported high levels of self-reported awareness and generally positive attitudes toward addressing opioid-related problems. Most respondents (93.5%) reported understanding the difference between opioid abuse and misuse, while 75.1% were willing to provide counseling. Familiarity with naloxone was reported by 81.5%, although 43.8% did not feel confident administering it. Confidence in naloxone administration was significantly associated with work experience ($p = 0.017$).

Conclusion: Despite positive attitudes and reported awareness, confidence in naloxone administration was lower, indicating a gap in self-reported preparedness. Practical training and clearer professional and regulatory guidance may help address this gap.

Keywords

community pharmacy professionals, harm reduction, naloxone, opioid abuse, opioid misuse

Introduction

Opioid misuse and abuse remain a complex challenge for public health and healthcare systems. For the purposes of this study, opioid misuse refers to the use of prescription opioids in a manner other than prescribed, while opioid abuse refers more broadly to harmful or non-medical opioid use. Opioids continue to be widely used in the treatment of moderate to severe pain, but their uncontrolled use is linked to addiction, misuse, and overdose. Over the past two decades, rising opioid-related harm has pushed many health systems to reconsider

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prescribing practices. This has also led to closer attention to the roles of health professionals involved in opioid access and patient care (Cobaugh et al. 2014; Mubarak et al. 2023).

Community pharmacy professionals play an important role in this area. They work at the point where doctors, patients, and the healthcare system meet. Because of this, they often come into contact with individuals using opioids more frequently than many other healthcare professionals. In previous studies, pharmacists have been described as "frontline" or "gatekeeper" healthcare professionals, mainly because of their position in preventing opioid-related harm (Wagner and Andrade 2010; Hartung et al. 2018; Vadiei et al. 2022).

At the same time, the role of community pharmacy professionals in addressing opioid misuse is not always clear. Many pharmacists report uncertainty about how far their responsibilities should go, especially when patient safety conflicts with professional boundaries or relationships with prescribers. Qualitative studies show that this uncertainty often leads to hesitation. Pharmacists also report discomfort when intervening in opioid-related situations, most often because of limited time and concerns about legal or professional consequences (Donohoe et al. 2019; Blue et al. 2020).

Providing naloxone is one of the most visible harm reduction activities linked to pharmacy practice. Several studies show that pharmacists generally support access to naloxone and recognize its potential role in overdose prevention (Blue et al. 2020; Alanazi et al. 2024). Still, positive attitudes toward naloxone do not always translate into confidence in practice. In several studies, pharmacists report limited training and uncertainty about how to administer naloxone in practice (Blue et al. 2020; Mobrad et al. 2020).

Despite the growing international literature, evidence from Kosova and the wider Balkan region remains limited. In Kosova, there is limited published evidence on the involvement of community pharmacy professionals in addressing opioid misuse and naloxone-related harm reduction, leaving an important gap in understanding their preparedness for this role. Community pharmacies are among the most accessible healthcare settings in the country, placing community pharmacy professionals in a potentially important position to support patient counseling, early identification of opioid-related problems, and harm reduction activities.

Pharmaceutical practice in Kosova is regulated by national legislation governing medicinal products and retail pharmacy services. Although these regulations define the responsibilities of pharmacy professionals in the dispensing and management of medicines, the current regulatory framework does not explicitly provide community pharmacists or pharmacy technicians with the authority to administer naloxone. This regulatory uncertainty is particularly relevant when assessing pharmacy professionals' willingness and confidence to participate in opioid overdose management (Republic of Kosovo 2014; Ministry of Health of the Republic of Kosovo 2015).

For this reason, the present study examines the awareness, attitudes, and self-reported confidence of community pharmacy professionals in Kosova regarding opioid abuse and naloxone use, with particular attention to counseling attitudes and self-reported confidence related to naloxone administration. By also considering differences across levels of professional experience, the study aims to provide evidence that may inform future training, professional guidance, and policy related to community pharmacy professionals' roles in reducing opioid-related harm.

Materials and methods

Study design

A descriptive cross-sectional study was conducted from June to November 2025. Data were collected using a structured questionnaire administered online through pharmacy-related social media platforms and professional groups across Kosova. Participants were recruited using voluntary, non-probability sampling.

Participants and setting

A total of 460 community pharmacy professionals working in community pharmacies across Kosova participated in the study. No formal *a priori* sample-size calculation was performed; recruitment was conducted pragmatically during the predefined data collection period, resulting in a final sample of 460 participants. Participation was voluntary, and participants were asked to complete the questionnaire only once. The survey was anonymous. Participants were informed about the purpose of the study and assured that their responses would remain confidential and would be used only for research purposes. Submission of the questionnaire was considered to indicate informed consent.

Data collection and research instrument

Data were collected using a questionnaire created specifically for this study. The questions were based on previous research (Jaber et al. 2015; Donohoe et al. 2019; Blue et al. 2020; Mobrad et al. 2020; Rao et al. 2021; Mubarak et al. 2023; Alanazi et al. 2024), translated into Albanian by the authors, and adapted to reflect the local context. Before distribution, the questionnaire was reviewed by all authors to assess the clarity and relevance of the items to the study objectives and local context. No formal content validity index was calculated. The questionnaire contained 29 items covering demographic and professional background, awareness of opioid abuse and misuse, attitudes toward counseling and harm reduction, reported practices, and self-reported confidence related to naloxone administration.

In this study, naloxone administration refers to the direct administration of naloxone by pharmacy profession-

als, whereas naloxone provision refers to making naloxone available through the pharmacy.

The questionnaire was distributed online using Google Forms through pharmacy-related social media groups and professional pages commonly used by pharmacy professionals in Kosova. Because the survey was distributed through online groups and professional pages, the total number of eligible individuals who received or viewed the invitation was unknown; therefore, a response rate could not be calculated. No formal pilot testing of the questionnaire was conducted before data collection.

Demographic information included age, gender, educational qualification, work experience, working hours, and the location of the pharmacy. Attitude- and practice-related items were assessed using simple categorical response options. Confidence related to naloxone administration was assessed using a single-item measure with three response categories: not confident, confident enough, and very confident.

Selection criteria

Participants were eligible if they were working in a community pharmacy in Kosova during the study period. This included pharmacists and pharmacy technicians who were directly involved in dispensing medicines and counseling patients. Only those currently working in community pharmacies and willing to complete the questionnaire were included. Responses from individuals not working in community pharmacies, not involved in patient contact or dispensing, or with incomplete questionnaires were excluded from the analysis. A total of 460 completed questionnaires were received, and no responses were excluded from the final analysis.

Ethical clearance

The study was reviewed by the Ethics Committee of the Faculty of Medicine, University of Prishtina, with the formal written decision issued on 31 December 2025 (Decision No. 11401). Formal ethical approval was therefore obtained after completion of data collection. Participation in the survey was voluntary and anonymous, and participants were informed about the purpose of the study before completing the questionnaire.

Data analysis

As the survey was anonymous and did not collect personal identifiers, it was not possible to fully prevent duplicate submissions. However, responses were reviewed during data cleaning to identify any clear duplicates. Descriptive statistics were used to summarize participant characteristics and responses. Frequencies and percentages were calculated for categorical variables and are presented in Tables 1–4. Chi-square tests were used to examine associations between work experience and questionnaire responses, as these variables were categorical. Work experience was selected as the main grouping variable to explore whether participants' responses differed according to their level of professional experience. Given the exploratory nature of these analyses, no adjustment for multiple comparisons was applied. Chi-square findings were interpreted cautiously, particularly where response categories contained small numbers of observations. Internal consistency was assessed using Cronbach's alpha for the attitude and awareness item groups. The final attitude scale included items 1–3 and 12 in Table 2, while the awareness scale included items 1–4 in Table 3. Statistical significance was set at $p < 0.05$. All analyses were performed using SPSS Statistics for Windows, v. 24.

Results

A total of 460 community pharmacy professionals participated in the study (Table 1). Most participants were female (75.8%, n = 349), and 57.7% (n = 265) were aged 19–30 years. The majority held a Master of Pharmacy degree (65.4%, n = 301), while 20.8% (n = 96) were pharmacy technicians and 13.8% (n = 63) were pharmacists with postgraduate education. More than half of the participants (52.3%, n = 241) had one to four years of work experience. Most respondents worked full time (86.9%, n = 400) and were employed in pharmacies located in urban centers (66.2%, n = 305).

Participants generally expressed positive attitudes toward the role of community pharmacies in addressing

Table 1. Characteristics of the study participants by the number of total participants.

	Total	
	Number	**Percentage (%)**
Gender		
Male	111	24.2%
Female	349	75.8%
Age group		
19–30	265	57.7%
31–40	129	28.1%
41–50	48	10.4%
Over 50	18	3.8%
Qualification		
Pharmacy technician	96	20.8%
Master of Pharmacy (MPharm)	301	65.4%
Pharmacist with postgraduate education	63	13.8%
Work experience		
1–4 years	241	52.3%
5–9 years	99	21.5%
10–14 years	37	8.1%
15–19 years	49	10.6%
Over 20 years	34	7.3%
Working hours		
Full-time	400	86.9%
Part-time	60	13.1%
Where is the pharmacy located?		
Urban center	305	66.2%
Urban outskirts	138	30%
Rural area	17	3.8%

opioid abuse (Table 2). The internal consistency of the attitude items toward opioid abuse (items 1–3 and 12 in Table 2) was acceptable (Cronbach's α = 0.76). Item 4 was excluded from the scale because its inclusion resulted in lower internal consistency (Cronbach's α = 0.63). A total of 75.8% agreed that pharmacies are appropriate settings for counseling individuals suspected of opioid abuse, while 75.1% reported willingness to provide such counseling. Support for dispensing opioids only with a valid medical prescription issued by an authorized prescriber was high (93.5%). However, 38.5% agreed that the sale of controlled medications without a prescription represents an important source of pharmacy income. In addition, 94.6% agreed that pharmacy professionals should not sell medications to individuals who appear to be abusing them.

The need for education and training was also strongly emphasized. Almost all respondents agreed that pharmacy staff should be trained to recognize individuals with substance misuse (95.0%) and informed about medications with abuse potential (98.5%). Nearly all participants (97.3%) stated that they regularly warn patients about the side effects of controlled medications. A total of 68.5% believed that pharmacist-led education and access to naloxone may help reduce opioid-related harm. At the same time, 54.2% expressed concern that administering naloxone would require more time than they could provide in routine pharmacy practice. Several attitude- and practice-related responses were significantly associated with work experience, including views on prescription-only opioid dispensing, training and professional collaboration, naloxone-related education, and time constraints (Table 2).

As shown in Table 3, participants generally reported high levels of awareness regarding opioid misuse. The internal consistency of the awareness items (items 1–4 in Table 3) was good (Cronbach's α = 0.81). Most respondents (93.5%) reported understanding the difference between opioid abuse and misuse. In relation to reported practices, 78.1% reported suggesting safer alternatives when misuse was suspected. In contrast, only 31.9% reported contacting nearby pharmacies to inform them of an individual suspected of opioid misuse. Familiarity with naloxone and its use was reported by 81.5% of respondents. Significant associations with work experience were observed for self-reported understanding of the difference between opioid abuse and misuse ($p = 0.039$) and familiarity with naloxone ($p = 0.001$).

Levels of self-reported confidence in administering naloxone are presented in Table 4. Overall, 56.2% of

Table 2. Descriptive analysis of participants' responses based on the "Agree," "Disagree," and "I am not sure" categories.

	Agree	Disagree	I am not sure	*p*-value for association with work experience
The pharmacy is an appropriate place to counsel individuals suspected of opioid abuse regarding the risks or methods of their treatment.	75.80%	13.60%	10.4%	0.305
I am willing to counsel individuals suspected of opioid abuse regarding the risks or treatment options.	75.10%	22.90%	2.00%	0.100
I think that controlled drugs (opioids) should be sold in pharmacies, but only with a valid medical prescription.	93.5%	3.1%	3.5%	**0.013**
The sale of controlled drugs without a prescription is an important source of money for pharmacies.	38.5%	48.5%	13.1%	0.718
I treat individuals suspected of opioid abuse the same way I treat other patients.	31.5%	60%	8.5%	0.106
I warn/advise patients about the expected side effects associated with controlled drugs.	97.3%	2.3%	0.4%	**0.018**
All pharmacy staff should be trained in recognizing individuals with substance misuse.	95%	2.3%	2.7%	**0.040**
All pharmacy staff should be informed about drugs that can be abused.	98.5%	1.2%	0.4%	**0.006**
All staff should be trained in methods of supporting individuals with substance misuse.	94.6%	2.3%	3.1%	**0.035**
Pharmacists must collaborate with each other and with all other members of the medical team in the provision of controlled medications.	95.8%	1.2%	3.1%	**0.023**
Pharmacists should not sell medications to people who appear to be abusing them.	94.6%	1.9%	3.5%	**0.044**
There is a need within our community to address opioid abuse.	90.4%	5%	4.6%	**0.016**
Education provided by pharmacists and the provision of naloxone can help reduce opioid abuse.	68.5%	10.4%	21.2%	**0.001**
I am concerned that administering naloxone will take more time than I can provide.	54.2%	15%	30.8%	**0.027**

Chi-square tests were used to examine associations between work experience and questionnaire responses. Statistically significant results ($p < 0.05$) are shown in bold.

Table 3. Descriptive analysis of participants' responses based on the "Yes," "No," and "I am not sure" categories.

	Yes	No	I am not sure	*p*-value for association with work experience
Do you know the difference between the terms "opioid abuse" and "misuse"?	93.5%	3.1%	3.5%	**0.039**
I suggest safer alternatives to medications that are being abused.	78.1%	12.3%	9.6%	0.723
I call nearby pharmacies to inform them of an individual suspected of opioid misuse.	31.9%	56.5%	11.5%	0.378
Are you familiar with naloxone and its action?	81.5%	14.6%	3.8%	**0.001**

Chi-square tests were used to examine associations between work experience and questionnaire responses. Statistically significant results ($p < 0.05$) are shown in bold.

Table 4. Self-reported confidence in administering naloxone among community pharmacy professionals.

	Not confident	Confident enough	Very confident	*p*-value for association with work experience
How confident and safe do you feel in administering naloxone at the pharmacy where you work?	43.8%	40.4%	15.8%	**0.017**

Chi-square tests were used to examine associations between work experience and questionnaire responses. Statistically significant results ($p < 0.05$) are shown in bold.

participants reported feeling either confident enough or very confident in administering naloxone in their pharmacy setting, while 43.8% reported not feeling confident. Self-reported confidence in administering naloxone was also significantly associated with work experience ($p = 0.017$).

Discussion

This study adds to the growing body of evidence on the role of community pharmacy professionals in addressing opioid abuse by providing data from Kosova, a setting where empirical evidence has been limited. Overall, the findings suggest that community pharmacy professionals report high levels of awareness of opioid-related risks and generally positive attitudes toward prevention and harm reduction. At the same time, the results point to gaps between willingness, self-reported awareness, and perceived confidence, particularly in relation to naloxone administration.

The high level of support for counseling and prescription-only dispensing observed in this study is consistent with findings reported in studies from Pakistan, Saudi Arabia, and the United States, where pharmacists generally viewed opioid misuse as an important public health concern and supported a more active role in prevention and patient counseling (Blue et al. 2020; Rao et al. 2021; Mubarak et al. 2023). The finding that 38.5% of participants viewed the sale of controlled medications without a prescription as an important source of pharmacy income should be interpreted cautiously, as this item reflects participants' perceptions and does not indicate their own dispensing practices. Similar findings have been reported in previous studies, suggesting that pharmacists increasingly view opioid stewardship and patient education as part of their professional responsibilities (Wagner and Andrade 2010; Cobaugh et al. 2014; Nielsen et al. 2016; Kohl 2017; International Pharmaceutical Federation 2018; Hartung et al. 2018; Blue et al. 2020; Murnane et al. 2022; Vadiei et al. 2022). This also aligns with international guidance emphasizing the role of pharmacists in safe opioid use, patient education, and early identification of misuse (WHO 2014; Scholten 2017).

In many European contexts, community pharmacies are among the most accessible healthcare settings, positioning pharmacists as potentially important contributors to public health responses related to substance use (Squires 2002; EMCDDA 2016, 2023; Goosdeel 2024; Offu et al. 2024).

The strong agreement regarding the need for education and training observed in this study echoes previous research suggesting that pharmacists recognize the limits of their current preparation when dealing with substance use-related issues (Jaber et al. 2015; Donohoe et al. 2019; Rao et al. 2021; Hughes et al. 2024).

Most participants reported that they warn patients about side effects and suggest safer alternatives. However, few reported contacting nearby pharmacies regarding individuals suspected of opioid misuse. Similar patterns have been observed in other studies. Pharmacists often feel comfortable with individual counseling but hesitate when broader collaboration is required (Giannetti et al. 2018; Meisel et al. 2019; Magwood et al. 2020; Dhumal et al. 2021; Offu et al. 2024). Such hesitation may reflect barriers to broader professional collaboration, although these factors were not directly examined in the present study.

Naloxone-related findings are particularly notable. Although most respondents were familiar with naloxone and many agreed that pharmacist involvement in naloxone provision could reduce opioid-related harm, nearly half reported low confidence in administering it. More than half also expressed concerns related to time constraints. Comparable gaps between support and confidence have been documented in studies across North America, Europe, and the Middle East (Clark et al. 2014; Green et al. 2015; Mueller et al. 2015; Mobrad et al. 2020; Razaghizad et al. 2021; Alanazi et al. 2024).

Previous studies suggest that these concerns may be related to limited hands-on training, unclear legal protections, and uncertainty about how naloxone provision fits into daily pharmacy workflows (Clark et al. 2014; Mueller et al. 2015; Freeman et al. 2017).

In Kosova, the role of community pharmacy professionals in naloxone administration is not clearly defined by the current legislation. Therefore, participants' responses regarding confidence in administering naloxone should be viewed as their perceptions of a potential role rather than experience with an established pharmacy practice.

The gap between willingness and confidence may involve factors beyond training and knowledge. Professional identity, stigma around opioid use, and the challenges of discussing suspected substance misuse may also play a role, although these factors were not directly assessed in the present study. Previous studies have shown that pharmacists often feel tension between their roles as healthcare providers, gatekeepers, and business professionals (Meyerson et al. 2018; Riley and Alemagno 2019; Vadiei et al. 2022; Wu et al. 2024). In some settings, fear of damaging patient relationships or being perceived as judgmental may further discourage proactive engagement (Giannetti et al. 2018; Magwood et al. 2020; Nichols et al. 2023).

Significant associations with work experience were observed for several items in the present study, including naloxone familiarity and self-reported confidence. Previous studies have also reported differences according to professional experience, with more experienced pharmacists often reporting greater comfort when addressing opioid-related situations and engaging in patient counseling (Laliberté et al. 2012; Meyerson et al. 2018; Rao et al. 2021; Kosobuski et al. 2022).

Although the present findings should be interpreted cautiously, work experience was associated with several aspects of participants' perceptions and self-reported confidence. This highlights the importance of continued professional development and training throughout professional practice.

Taken together, the results suggest that community pharmacy professionals in Kosova generally report positive attitudes toward involvement in opioid abuse prevention, while educational and regulatory barriers may affect their involvement in practice. International evidence suggests that successful pharmacist involvement in opioid harm reduction is most likely when training, regulatory clarity, and institutional support are aligned (McDonald and Strang 2016; Volkow and McLellan 2016; Wakeman and Barnett 2018; CDC 2022; Dowell et al. 2022). From a public health perspective, improving pharmacists' confidence and practical skills may support earlier identification of opioid-related concerns and strengthen harm reduction efforts in community pharmacy settings, especially in settings where access to specialized addiction services is limited (McDonald and Strang 2016; EMCDDA 2018; Grund and Shaw 2019; Thylstrup et al. 2019; Strang et al. 2020).

Strengths and limitations

This study has several strengths. It includes a relatively large sample of community pharmacy professionals from across Kosova, offering a broad view of community pharmacy professionals' self-reported awareness, attitudes, and confidence related to opioid abuse and naloxone use. The inclusion of participants with varying levels of professional experience allowed exploration of differences in responses according to work experience. In addition, the study provides original data from a setting where empirical evidence on the role of community pharmacy professionals in opioid harm reduction remains limited.

Several limitations should be considered when interpreting these findings. First, the cross-sectional design captures attitudes, self-reported awareness, and perceived confidence at a single point in time and does not allow for conclusions about causality or changes over time. As with other survey-based studies, responses may have been influenced by social desirability, particularly for questions related to professional responsibility and ethical practice.

Second, the findings are based on self-reported data rather than direct observation of practice. This means that actual behavior and practical competence in real situations may differ from self-reported responses. Previous studies have shown that willingness or familiarity does not always lead to action, especially in sensitive areas such as substance use and overdose response.

Third, although the study included a large number of community pharmacy professionals from across Kosova, participation was voluntary and conducted online. This may limit representativeness. Community pharmacy professionals with a stronger interest in public health or opioid-related issues may have been more likely to participate, which may have contributed to more positive responses overall. In addition, the study did not directly examine organizational, regulatory, or policy factors that may influence community pharmacy professionals' confidence and engagement in opioid harm reduction. These factors should be explored in future qualitative or mixed-methods research. Additional limitations relate to the study instrument, which was developed specifically for this study, and to the assessment of confidence in naloxone administration using a single item. In addition, pharmacists and pharmacy technicians were analyzed together, without separate analysis according to professional qualification, which should be considered when interpreting the findings.

Conclusion

This study highlights that community pharmacy professionals in Kosova reported high levels of awareness of opioid abuse and misuse and largely positive attitudes toward their potential role in prevention and harm reduction. Community pharmacy professionals reported willingness to engage in counseling, patient education, and responsible dispensing practices, suggesting that community pharmacies may represent a potential setting for interventions addressing opioid abuse.

At the same time, the findings point to a gap between willingness and self-reported confidence, especially in relation to naloxone use and more active harm reduction activities. These findings may be related to factors such as limited practical training, uncertainty about professional boundaries, and the challenges of managing sensitive opioid-related situations in everyday pharmacy practice, although these factors were not directly assessed in this study. Associations with work experience were also observed for several items, including naloxone familiarity and self-reported confidence.

Overall, strengthening the role of community pharmacy professionals in opioid abuse prevention will require more than awareness alone. Practice-oriented training, clear professional guidance, and supportive regulatory frameworks may be needed to help translate positive attitudes and self-reported awareness into greater confidence in practice.

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statements

The authors declared that no clinical trials were used in the present study.

The authors declared that no experiments on humans or human tissues were performed for the present study.

Informed consent was obtained from all participants. Participation was voluntary and anonymous, and submission of the completed questionnaire was considered to indicate informed consent.

The authors declared that no experiments on animals were performed for the present study.

The authors declared that no commercially available immortalised human and animal cell lines were used in the present study.

Artificial Intelligence (AI) use

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI.
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Author contributions

ZI and DS supervised the study and had full access to the data. ZI, DS, and AH contributed to the study design. AH, VQ, and AB contributed to data collection and questionnaire administration. VQ, AB, and DH contributed to data analysis and interpretation. ZI, AH, and DS drafted the manuscript. DH contributed substantially to the statistical analysis and critical revision of the manuscript. All authors reviewed and approved the final manuscript.

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Data availability

Data are available upon reasonable request from the corresponding author.