



Improving organizational preparedness for community pharmacy-based naloxone and opioid counseling services in both urban and rural environments

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The paper “A Cross-Sectional Survey Exploring Organizational Readiness to Implement Community Pharmacy-Based Opioid Counseling and Naloxone Services in Rural Versus Urban Settings in Alabama”¹ has provided rich insights into disparities in readiness to adopt opioid counseling and naloxone (OCN) services in community pharmacies of Alabama. The authors operationalize the domains of evidence, context, and facilitation based on the Organizational Readiness to Change Assessment (ORCA) framework, which shapes the nature of implementation readiness.² Given the context of Alabama—a state in the U.S. with some of the highest rates of opioid prescriptions—this study underlines the sheer need to address the challenge of public health in the Deep South. Major findings point out significant disparities between rural and urban settings, particularly regarding clinical experience, staff culture, and attributes of senior management as actionable predictors for OCN implementation.

The study is characterized by the stringency in the methodology, including a validated assessment tool and a strong internal consistency across the subscales. The novelty of the research lies in the differentiation between rural and urban pharmacy contexts, thus offering practical recommendations on how to increase readiness for implementation by leadership and staff culture, particularly in resource-poor rural settings. Another suggestion by the research is regarding partnerships by the pharmacies with educational institutions, which fully corresponds to the best international practices within the scope of harm reduction and workforce development.

Areas for improvement

Notwithstanding these advantages, there are a few drawbacks that

could strengthen the current study if addressed, which are also discussed by Hohmann et al. as study limitations. Although the results are significant for Alabama, there is little chance that they can be applied to other areas with distinct healthcare systems and populations. Similar research carried out in other states or areas might increase the generalizability. Additionally, it primarily concentrates on organizational internal characteristics, ignoring external factors like professional governance, stigma, and state legislation that might be crucial in assessing implementation preparedness. For a thorough grasp of external factors, these aspects could be investigated further. A more comprehensive analysis of external policy initiatives and practical case studies from other states or nations would offer a valuable comparative perspective to strengthen the study. Specifically, examining variations in statewide naloxone laws, reimbursement structures, and regulatory frameworks could deepen understanding of the key factors influencing OCN implementation. Incorporating this broader context would help position the study's findings within a wider public health policy landscape.

Additionally, the analysis's breadth is limited by the implementation status, which is a binary category (implementers vs. non-implementers). Future studies might look into preparedness at smaller scales, including being ready for particular OCN components, like naloxone instruction and counseling. Incorporating patient preferences and satisfaction into the evaluation methodology^{3–7} would only increase the findings' applicability and relevance.

Policy and practice implications

This commentary study has worthy recommendations for policy and

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practice. These recommendations are based on the authors' interpretation of the findings from Hohmann et al.¹ and are further supported by the broader literature on OCN implementation. Policy makers should advocate for sustainable reimbursement frameworks that cover counseling and naloxone education. In addition, recent studies underscore the significance of financial incentives and standardized insurance reimbursements in boosting adoption rates.^{8–10} Implementing flexible reimbursement frameworks could be particularly cost-effective in rural areas, where operational expenses often delay implementation.

Supporting rural pharmacies with limited resources will also require targeted techniques like telepharmacy and mobile health. In addition to community involvement initiatives, public awareness campaigns aid in lowering stigma and boosting trust in OCN's community pharmacy-based services. Additionally, Hohmann et al.¹ recommends that training programs be customized to address the different issues faced by rural and urban pharmacies.

Bibliometric analysis

As part of the complement to this study, a bibliometric analysis was done with the view to find knowledge, practice, and regulatory framework gaps on OCN services. Bibliometric analysis uses various mathematical and statistical methods to examine interconnected publications. It also offers a tool for following growth in research and emerging trends.¹¹ This analysis was undertaken with the aim of supporting researchers and healthcare practitioners while revealing the deficiencies in existing knowledge and suggesting avenues for future research. By the identification of underexplored areas, this analysis provides a background for the advancement of implementing OCN services in various settings. The subsequent bibliometric analysis extends beyond the specific findings of the Alabama study, using Scopus data to provide a broader framework for understanding OCN deployment trends. While this analysis offers a more comprehensive perspective, it may not directly reflect the outcomes of the Alabama-specific study.

This study used the Scopus database, one of the major bibliometric research platforms,^{12,13} for the search and identification of publications dealing with opioid counseling services in community pharmacies and organizational readiness. The following query was inserted into the advanced search option in Scopus: (opioid counseling OR naloxone services OR opioid overdose prevention) AND (community pharmacy OR pharmacist) AND (organizational readiness OR implementation OR adoption).

This search targeted the documents that had these terms in either their title, abstract, or keywords. The search was restricted to English-language journal papers published from 2017 to 2024; data extraction was done on November 11, 2024, to avoid any bias from database updates. Errata and withdrawn documents were excluded, which left a total of twelve articles.

Titles, abstracts, and full texts were manually reviewed to ensure relevance and eliminate unrelated entries. To validate the search query, two bibliometric experts examined the five most-cited papers, confirming the absence of false positives. A correlation test comparing the dataset against findings from the ten most active researchers in the field demonstrated strong agreement ($r = 0.832$, $p < 0.001$), affirming the reliability and accuracy of the search strategy. The "ten most active researchers in the field" were identified based on the highest number of publications indexed in Scopus that matched our search criteria for the period 2017–2024. A list of these authors is provided in Supplemental Table 1.

To enhance the reliability of the bibliometric search, a secondary search was conducted using identical keywords in Web of Science, PubMed and Google Scholar—to capture any studies not indexed in Scopus. This expansion broadens the literature base and enables a more robust analysis of research developments in naloxone counseling and opioid counseling services.

The data extracted in this regard was exported into CSV format for

analysis using Microsoft Excel. The following information was included: title, abstract, authors, affiliations, year of publication, funding sources, document type, citations, and journal name. To improve clarity, the keyword analysis that follows focuses only on the most relevant thematic clusters related to the primary focus of this commentary.

Keyword analysis

To visualize the network maps based on the co-occurrence of terms in titles and abstracts, as well as the collaboration patterns of countries, the VOSviewer software, Version 1.6.20, was used. Co-occurrence analysis grouped these terms into distinct thematic groups, allowing the identification of research flashpoints and emerging trends. Findings from the keyword co-occurrence analysis of titles and abstracts included three thematic clusters, with each cluster representing one critical domain of community pharmacy based opioid counseling and naloxone services. Fig. 1 illustrates these correlations, with the size of the nodes and the thickness of the lines indicating the frequency and strength of concept co-occurrence. Key clusters include:

- Red Cluster: Keywords such as “naloxone,” “opioid-related disorders,” and “pharmacist” underlined the central position of pharmacists in clinical interventions, harm reduction, naloxone distribution, and highlights the central role of pharmacists in addressing the opioid crisis.
- Green Cluster: Keywords involve “community pharmacy services,” “pharmacy students,” “controlled study” and “health program”; the necessity of integrating opioid counseling into pharmacy practice was underlined, with an emphasis on education and training to improve the capability of the pharmacist, emphasizing the importance of pharmacist training and the accessibility of community pharmacies as OCN service hubs.
- Blue Cluster: Key terms identified are “adult,” “male,” “female; demographic-specific studies and controlled trials provide evidence-based insights into pharmacy-led therapies, and focuses on the relevance of demographic factors in the design and implementation of OCN programs.

These findings are also consistent with themes emerging from this commentary, pointing to a link between opioid-related counseling, pharmacist training, and evidence-based practice. These visualizations underline the need for targeted education, demographic-specific approaches, and changes in regulations toward improving organizational readiness and enhancing access to expanded naloxone services in underserved areas, such as rural Alabama (Fig. 1).

Exploration of prospective research pathways

The chronological arrangement of the terms in the co-occurrence network reflects an evolution from basic research in opioid use to practical interventions. Earlier terms, like “prescription” and “drug overdose,” have their roots in initial investigations regarding the opioid crisis and approaches to harm reduction. Recent terms like “education,” “pharmacy students,” and “community pharmacy services” reflect emerging emphasis on translating opioid-related interventions into pharmacy practice and calls for improving pharmacist training.

Other current terms include “controlled study” and “internal consistency,” reflecting an increased emphasis on the necessity for methodological rigor and, therefore, further strengthening the evidence base that supports pharmacy-led interventions. Among the geographic-specific terms are “Alabama” and “health program,” reflecting efforts to address disparities in healthcare access and organizational readiness in resource-constrained areas. Fig. 2 showcases temporal trends in research, revealing a clear shift toward more applied, community-based approaches over time. These trends reinforce the calls from Hohmann et al.'s study for region-specific policies and tailored approaches to

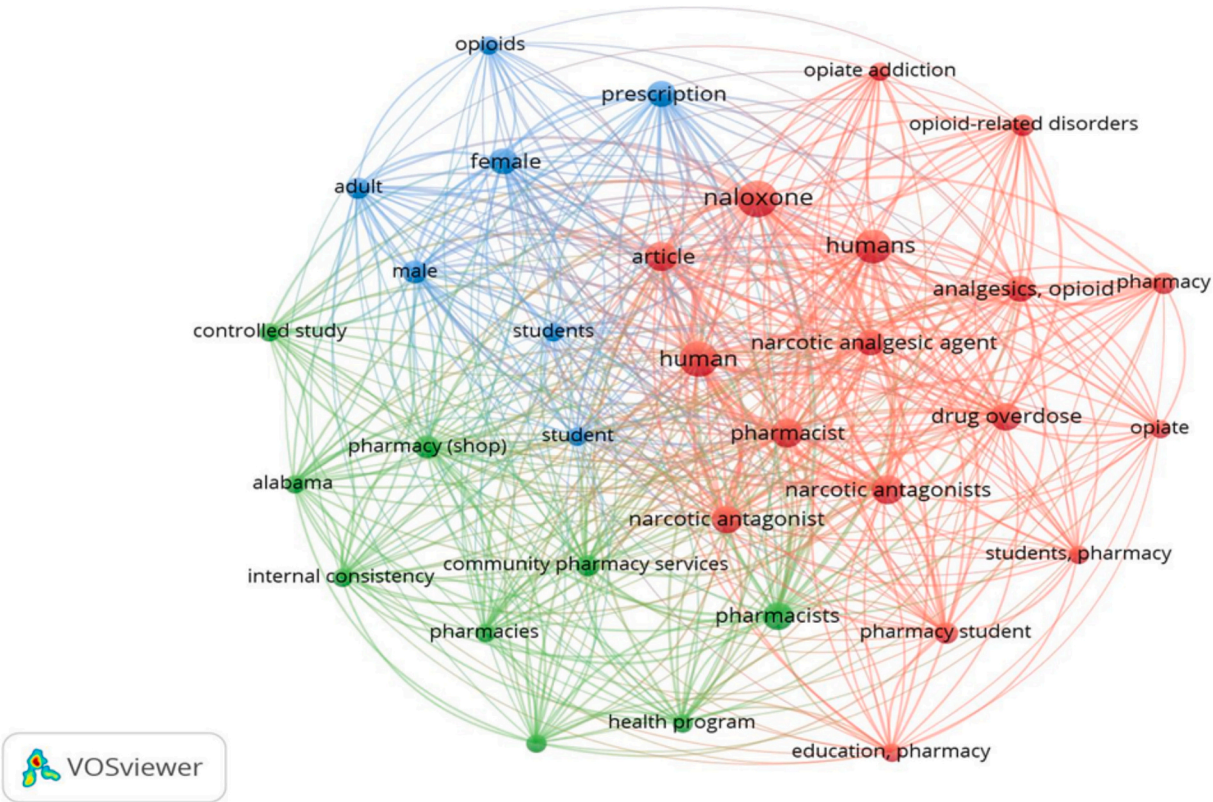


Fig. 1. Co-occurrence network of keywords visualization related to opioid counseling services in community pharmacies and organizational readiness.

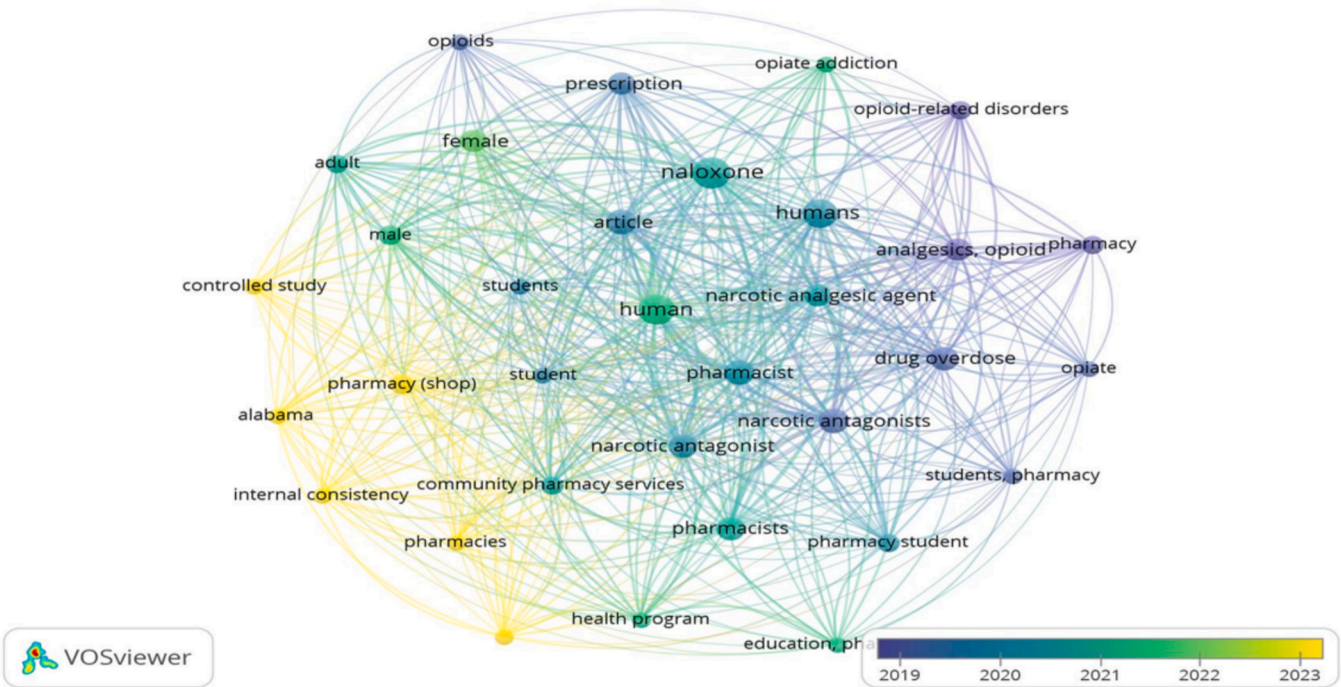


Fig. 2. Overlay visualization of the co-occurrence network related to opioid counseling services in community pharmacies and organizational readiness.

enhance community pharmacy’s role in mitigating the opioid crisis (Fig. 2).

Conclusion and recommendations

The developing landscape of research and practice in community pharmacy opioid counseling and naloxone services brings forward with force the need to shift the focus to the bridging of knowledge, practical,

and regulatory gaps impeding the effective implementation of these life-saving mediations. The bibliometric assessment and the visualization of the co-occurrence network underline the shifting interest toward intervention-focused strategies, including pharmacist education, institutional readiness, and equity in service provision. These findings echo the disparities observed between rural and urban settings and provide actionable insights to address these challenges through targeted interventions.

The significant barriers in rural areas include inadequate epidemiological data, insufficient training of pharmacists, resource constraints, geographic isolation, and insufficient telepharmacy infrastructure. Legal hurdles also create complexity for service delivery, including inconsistencies in naloxone dispensing regulations and reimbursement policies. Challenges in urban areas include high patient volume, integration into workflows, staff fatigue, and a lack of incentives for pharmacies to make opioid-related offerings a priority. Pervasive stigma, policy inconsistencies, and a lack of interprofessional collaboration are common to both settings. Future research should investigate whether expanding pharmacists' authority to prescribe naloxone leads to improved community-level outcomes. Long-term evaluations of pharmacist-led opioid intervention strategies, along with case studies of real-world implementations, could help identify scalable best practices for diverse healthcare settings.

These challenges are multidimensional in nature. Specialized training programs, which meet the specific needs of rural and urban pharmacists, could enhance their capacity to provide opioid counseling and naloxone services. Resource limitations in rural areas can be mitigated by telepharmacy and mobile health units, while process automation increases efficiency in urban areas. Harmonized policies on naloxone dispensing and comprehensive reimbursement frameworks are key in incentivizing pharmacies to reduce adoption barriers.

This bibliometrically underpinned review underlines the interconnectedness of these issues and the requirement for scalable, context-specific solutions. In addressing knowledge gaps, resource gaps, and policy gaps, community pharmacies can lead in combating the opioid crisis by assuring unbiased access to opioid counseling and naloxone services across diverse contexts. Future research also needs to be done on the development of new models of care, while establishing standardized criteria on the evaluation of such interventions, to ultimately enhance population health and establish community pharmacy as an integral part of the healthcare system.

CRediT authorship contribution statement

Ammar Abdulrahman Jairoun: Writing – review & editing, Writing – original draft, Visualization, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Moyad Shahwan:** Writing – review & editing, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Conceptualization. **Abeer M. Al-Ghananeem:** Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Conceptualization.

Consent for publication

All authors are agreed for publication of this manuscript in Medicine Journal.

Declaration of generative AI and AI-assisted technologies in the writing process

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Declaration of competing interest

All authors declare that they have no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.rcsop.2025.100604>.

Data availability

The original contributions presented in the study are included in the further inquiries can be directed to the corresponding authors.

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