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Challenges and barriers to noncommunicable disease management at community health centers in south Sumatera province, Indonesia: A qualitative study

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ABSTRACT

Background & Aim: Noncommunicable diseases (NCDs) are the leading cause of morbidity and mortality worldwide, heavily impacting low and middle-income countries like Indonesia. Community Health Centers (CHCs) play a critical role in providing healthcare, including NCD management, but they face significant challenges. This study explores the challenges and barriers to NCD management at CHCs in South Sumatra Province, Indonesia.

Methods & Materials: To gain an in-depth understanding of healthcare workers' management of NCDs, an exploratory content analysis approach was employed. Data were collected through semi-structured interviews with 12 health workers, including nurses, doctors, midwives, and public health workers. Content analysis was used for data analysis.

Results: The content analysis identified five themes: Resource constraints in primary healthcare, lack of effective interprofessional collaboration, social and cultural issues; work area coverage, and government policy and support.

Conclusion: These findings highlight the complex challenges faced by CHCs. Addressing them requires a comprehensive strategy to enhance NCD care and primary healthcare services. Policymakers and health system managers can use these insights to develop targeted interventions. Further research is recommended to assess the effectiveness of specific strategies in overcoming these barriers in low-resource settings.

Introduction

The global health landscape has undergone significant transformation over the past few decades, with non-communicable diseases (NCDs) emerging as the predominant cause of morbidity and mortality worldwide (1, 2). According to the World Health Organization (WHO), NCDs account for over 41 million deaths annually, representing 71% of all global deaths, with 15 million individuals succumbing to these conditions prematurely between the ages of 30 and 69 years (3). This global burden disproportionately affects low- and middle-income countries (LMICs), including Indonesia, where rapid economic, demographic, and epidemiological transitions exacerbate challenges in under-resourced healthcare systems (4).

Indonesia as one of the most populous countries in Southeast Asia, faces a unique confluence of challenges in its healthcare system due to the rising incidence of NCDs (5). In recent years, NCDs have surpassed infectious diseases as the leading cause of death, accounting for more than 70% of all deaths in the country (3). Indonesia's complex geography, characterized by vast archipelagic regions, further complicates equitable access to healthcare services, particularly in rural and remote areas where healthcare infrastructure remains underdeveloped (6, 7). For instance, North Musi Rawas Regency has been identified as a disadvantaged area facing significant challenges in achieving equitable healthcare access (8). This shifting disease burden demands a reconfiguration of the healthcare delivery system, with primary care facilities, especially Community Health Centers (CHCs) known as Puskesmas, playing

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a critical role in NCD management and prevention (9).

Community Health Centers (CHCs), as the cornerstone of Indonesia's primary healthcare system, are strategically positioned to provide essential healthcare services, including NCD care, to the majority of the population (9). These centers are expected to deliver preventive and curative services and promote community-based health interventions in line with Indonesia's commitment to achieving Universal Health Coverage (UHC) (10). Despite their pivotal role, CHCs encounter numerous operational and systemic barriers that undermine their ability to manage NCDs effectively (4, 11). The limitations are both structural and contextual, ranging from inadequate health workforce capacity, shortages of essential medications and diagnostic tools, fragmented healthcare policies, and the lack of an integrated NCD care model (12).

Operational and systemic barriers in CHCs are often interrelated, compounding challenges in managing NCDs effectively. For example, shortages of essential medications and diagnostic tools increase workloads and stress for healthcare workers, potentially leading to burnout and reduced motivation (12). Fragmented healthcare policies further complicate resource allocation and hinder the implementation of integrated NCD care models (7). Addressing these barriers requires targeted solutions, such as interprofessional collaboration to optimize workforce capacity through task-shifting, strengthening supply chains with digital inventory systems, and integrating NCD care at the primary level with cohesive policies (13). These multifaceted approaches can enhance CHCs' effectiveness in overcoming these challenges and improving healthcare outcomes.

Furthermore, patients seeking care for NCDs at CHCs encounter additional barriers, such as financial constraints, low health literacy, and socio-cultural stigmas surrounding chronic illnesses (14). These factors often contribute to poor health-seeking behaviours, delayed diagnosis, and suboptimal adherence to prescribed treatments, ultimately exacerbating the progression of NCDs (7). Low health literacy has been identified as a significant barrier to effective NCD management. Healthcare providers, as the primary point of contact for patients, are uniquely positioned to observe how low health literacy impacts health-seeking behaviors and treatment adherence (14, 15). Existing healthcare policies also fail to sufficiently address the need for a robust referral system between primary and tertiary care, leaving CHCs ill-equipped to manage advanced or complicated cases of NCDs (7).

While numerous studies have examined the burden of NCDs in Indonesia, there is a dearth of research focused on the specific challenges faced by CHCs in delivering NCD care. The majority of existing literature emphasizes disease-specific interventions without adequately addressing the systemic and structural barriers encountered at the primary healthcare level. Moreover, the qualitative experiences of healthcare providers remain underexplored, limiting the understanding of how these challenges and barriers are experienced and perceived at the community level. This study employs a qualitative approach using in-depth interviews to gather detailed insights from healthcare providers, who are central to the management of NCDs at CHCs. The study focuses on the overall management of NCDs, ensuring a comprehensive exploration of the challenges and barriers faced by CHCs.This study aims to explore the challenges and barriers to NCDs management at CHCs in South Sumatera Province, Indonesia.

Methods

Study design

This study uses an exploratory content analysis to gain an in-depth understanding of healthcare workers' management of NCDs. Exploratory content analysis is particularly relevant for this study as it enables a nuanced understanding of healthcare workers' management of NCDs by systematically examining the patterns, themes, and contextual nuances within the data. This design is

advantageous for uncovering complex and often implicit processes. Philosophically, this approach is grounded in a qualitative interpretive paradigm, which prioritizes understanding the subjective experiences and contextual realities of participants (16). This study was reported following the Standards for Reporting Qualitative Research (SRQR) by incorporating several key elements of the framework throughout the research process (17).

Study setting

This study was conducted in CHCs in the province of South Sumatra, Indonesia. Four study sites were selected based on recommendations from the health department. The health department identified these sites based on their varying levels of patient load, geographic accessibility, and the diversity of challenges they face in managing NCDs. This purposive selection ensured that the study captured a range of experiences and barriers representative of primary care facilities in the region. Data collection took place between May and July 2024.

Participants & sampling

Participants were selected using purposive sampling to ensure that those included met the following inclusion criteria: (1) health workers responsible for NCD management at the community health center; (2) minimum education level of Diploma III; (3) at least one year of experience in NCD management; (4) ability to communicate effectively and demonstrate cooperation. Participants were excluded if they had any health conditions that might affect their ability to provide relevant information or fully participate in the research. The number of participants was determined by data saturation, with data collection stopped when no new information emerged. Saturation was achieved when no new codes, themes, or insights emerged during the analysis of the interview transcripts. Regular discussions among the research team were conducted to evaluate the completeness of the data and ensure that all relevant aspects of the research topic were captured comprehensively before stopping data collection.

In total, twelve subjects participated in this study (Table 1). The participants consisted of 12 healthcare workers with an age range of 26 to 45 years, including 7 females and 5 males. Their professional roles varied, comprising nurses, midwives, medical doctors, and public health, reflecting the multidisciplinary team within the CHCs. The participants had diverse levels of experience, with lengths of work ranging from 3 to 19 years, and educational qualifications ranging from diplomas to bachelor's degrees. This diversity provided a broad range of perspectives on the challenges and strategies for managing NCDs in primary care settings.

Table 1. Participants characteristics

Participant code	Age (years)	Sex	Length of work (years)	Education level	Profession
P1	27	Male	5	Bachelor	Nurse
P2	42	Female	15	Bachelor	Nurse
P3	45	Female	13	Bachelor	Medical Doctor
P4	28	Female	5	Diploma	Nurse
P5	26	Male	3	Bachelor	Public Health
P6	40	Female	17	Diploma	Midwife
P7	42	Female	11	Diploma	Midwife
P8	35	Male	5	Bachelor	Medical Doctor
P9	30	Male	5	Bachelor	Public Health
P10	37	Female	4	Diploma	Nurse
P11	44	Male	19	Bachelor	Public Health
P12	39	Female	8	Bachelor	Midwife

Data collection

The study utilized in-depth interviews to fully explore the participants' experiences with the phenomenon under study. Direct observations were conducted to validate participant responses by comparing their descriptions with actual practices and behaviors in their work environment. Field notes were also maintained to document non-verbal cues, environmental factors, and informal interactions, providing additional context and capturing nuances that may not have emerged during the interviews. These complementary methods enriched the data collection process and ensured a holistic understanding of the challenges faced by healthcare workers (18).

The data collection tools used in this study included an audio recorder, a phone for voice calls or Zoom meetings for video calls, and field notes. The use of phone calls and Zoom meetings as data collection tools is justified because these platforms allow for more flexible and accessible communication with participants, especially when face-to-face interviews are not feasible. This approach is increasingly accepted in qualitative research as it facilitates real-time interaction and allows participants to engage from any location, thus minimizing geographical and logistical barriers (19).

The interviews were conducted after the healthcare workers had completed their healthcare services for the day, ensuring minimal disruption to their duties. The timing of the interviews was determined based on mutual agreement with the participants to accommodate their schedules. All interviews took place at the respective CHCs where the participants were based, providing a familiar and convenient environment for the data collection process. The duration of the interviews ranged from 60 to 100 minutes.

Data were collected through semi-structured interviews. Each interview began with broad questions such as "What challenges and barriers do you face in managing noncommunicable diseases?" The interviews then transitioned to more specific questions, such as "How have health workers experienced the increased workload associated with NCD management?", "What are the main factors influencing the effectiveness of NCD management at community health centers?", "What facility and resource constraints do health workers face in managing NCDs?", "How do government policies and programs affect the implementation of NCD management at the primary care level?", and "What strategies have health workers used to overcome challenges in NCD management?".

During the research process, the first author served as the interviewer and was trained in interview techniques by the supervisor. This training ensured that the interviewer was equipped with the necessary skills to guide conversations, ask probing questions, and elicit rich, detailed responses. The first author adhered to the interview guide to ensure consistency and avoided leading prompts during the interviews. During the analysis phase, peer debriefing sessions were conducted with the supervisor and research team to cross-check interpretations and ensure that findings were grounded in participants' responses, minimizing the influence of researcher preconceptions.

An interview guide was developed based on a review of relevant literature and consultation with the supervisor. The guide included both general and specific questions to help structure the interview while allowing flexibility for participants to share their experiences freely. Flexibility was operationalized by treating the guide as a framework rather than a fixed script. Open-ended questions encouraged participants to elaborate on their experiences, and probing questions were adapted dynamically based on participants' responses to explore new themes or clarify emerging ideas (20). This approach maintained consistency across interviews while accommodating the dynamic nature of qualitative research, allowing participants to introduce critical insights relevant to the phenomenon under study. The guide ensured consistency across interviews, while also allowing participants to introduce new themes and ideas that were critical to exploring the phenomenon in depth (17).

Data analysis

The audio recordings of the interviews were transcribed verbatim to create an accurate

record of the participants' responses. The transcriptions were then analyzed manually using a structured four-step process: decontextualization, recontextualization, categorization, and compilation. During decontextualization, data were broken down into smaller meaning units and coded manually using an open coding strategy. In recontextualization, the codes were reviewed alongside the research aim to ensure all relevant aspects were captured, and irrelevant information was discarded. Categorization involved manually grouping similar codes into preliminary themes and subthemes, which were iteratively refined through discussions among the research team. Finally, the compilation synthesized the findings, connecting the refined themes to draw meaningful conclusions and provide insights into the studied phenomenon (16).

Rigor

To ensure the rigors of the findings, the study adhered to four key criteria for establishing trustworthiness in qualitative research: credibility, transferability, dependability, and confirmability. Credibility was ensured through prolonged engagement by immersing deeply in the data through repeated readings of transcripts and iterative analysis over an extended period, allowing for a comprehensive understanding of participants' perspectives. Transferability was addressed by providing a detailed description of the context and participants, allowing readers to determine the applicability of the findings to other settings. Dependability was ensured by documenting the research process in detail, allowing others to follow and assess the rigor of the study. Confirmability was achieved by maintaining a transparent audit trail of decisions made during the research process, thereby minimizing researcher bias (21).

Ethical consideration

Ethical approval for this study was obtained from the Ethics Committee of the Faculty of Nursing, Universitas Indonesia, ensuring that the research adhered to ethical guidelines for the protection of participants. The approval number for this study is KET-148/UN2.F12.D1.2.1/PPM.00.02/2024, indicating that the study met the necessary ethical standards for academic research involving human subjects. Confidentiality was maintained by securely storing all audio recordings and transcripts on password-protected devices accessible only to the research team. Participants were fully informed of the objectives of the study and their informed consent was obtained prior to their participation. Ethical considerations such as confidentiality and voluntary participation were strictly adhered to throughout the research process.

Results

The content analysis identified five themes about challenges and barriers to NCDs management in primary healthcare settings. These themes encapsulate the key issues derived from the data, providing a comprehensive understanding of the challenges and barriers faced. The themes and sub-themes of this research are described in Table 2.

Table 2. Themes and subthemes

Sub Themes	Theme
a. Health worker shortage b. Excessive workload c. Limited facilities and equipment	1. Resource Constraints in Primary Healthcare
a. Egoism of each profession b. Lack of synergy c. Poor coordination of services	2. Lack of effective interprofessional collaboration
a. Lack of public awareness b. Misperceptions c. Non-compliance with treatment	3. Social and cultural issues
a. Extent of territory b. Accessibility	4. Work area coverage
a. Budget setting b. Lack of cross-sectoral coordination	5. Government policy and support

Resource constraints in primary healthcare

This theme identified challenges related to health worker workload and limited resources in health facilities. This first theme was supported by three sub-themes: *Health worker shortage, Excessive workload, and Limited facilities and equipment*. The first sub-theme, *health worker shortage* describes the lack of health workers, which leads to delays and reduced quality of care. Participant 2 stated, *" I feel that in addition to my service duties, I also have more administrative things to do, which reduces our capacity to offer comprehensive care to NCD patients…" (P2).* This statement highlights the dual burden faced by healthcare workers, where limited staffing requires them to balance clinical and administrative responsibilities.

In addition, there is an *excessive workload* on health workers as a result of an insufficient number of staff. This was expressed by Participant 3, who claimed, *"Our workload is very high. Every day, we have to take care of more patients than we can, especially patients with chronic diseases who need long-term care. (P3).* This statement underscores the strain placed on health workers due to staffing shortages, which forces them to handle an overwhelming number of patients. This excessive workload directly affects the quality and continuity of care provided to NCD patients, aligning with the challenges highlighted under the sub-theme.

The *limited facilities and equipment* available in health facilities were also perceived as an obstacle to the effective management of NCDs. This was reflected in a statement by Participant 4: *"The facilities at our CHCs are very limited, there are not enough Posbindu kits (Set of tools and equipment for NCDs) available, and this makes it difficult for us to provide optimal care" (P4).* This statement illustrates the resource constraints faced by primary healthcare workers, where inadequate infrastructure and essential tools hinder their ability to deliver effective care. It emphasizes the systemic challenges that fall under the sub-theme of limited facilities and equipment.

Lack of effective interprofessional collaboration

This theme identified problems with interprofessional collaboration in healthcare settings that affect the effectiveness of patient care. This second theme was supported by three sub-themes: *egoism of each profession, lack of synergy, and poor coordination of services.*

The majority of participants expressed the *egoism of each profession*. This refers to the selfish attitude of each profession, which tends to work separately without effective collaboration. Participant 5 mentioned that: *"Sometimes there is a sense of selfishness between the professions. Doctors often make their own decisions without involving nurses or pharmacists. This hinders communication in good collaboration." (P5).* This statement highlights the issue of egoism among professions, where a lack of shared decision-making undermines effective communication and collaboration, directly affecting the quality of care provided. For example, doctors are primarily responsible for diagnosing and prescribing treatments, nurses focus on implementing care plans and monitoring patient progress, and pharmacists ensure the safe and appropriate use of medications. When these roles are siloed, the care process becomes fragmented, leading to inefficiencies and potential risks to patient outcomes.

In addition, the participant revealed a *lack of synergy*. This describes the lack of synergy or coordination between different professions in providing care. Participant 8 stated: *"Each profession works independently, so there is often miscommunication in patient care." (P8).* This underscores the *lack of synergy*, where independent work and poor communication between healthcare professionals result in fragmented care, emphasizing the need for better coordination and teamwork. For example, regular interdisciplinary meetings and shared decision-making processes can foster synergy, ensuring that each professional contributes their expertise to deliver holistic and comprehensive care.

Poor coordination of services in service delivery leads to inconsistent or delayed care. This is reflected in the statement of Participant 7:

"Interprofessional coordination is still very weak. When there is a problem, it is sometimes confused to coordinate actions due to unclear responsibilities." (P7) This quote reflects the *poor coordination of services,* highlighting how unclear roles and responsibilities can delay or compromise care delivery. Strengthening interprofessional coordination through clear role definitions and collaborative protocols can minimize these issues, ensuring timely and effective care for patients. By fostering effective interprofessional collaboration, healthcare teams can combine their unique skills and knowledge to improve the continuity, efficiency, and quality of patient care.

Social and cultural issues

This theme focused on the social and cultural barriers that influence the management of NCDs. This third theme was supported by three sub-themes: *Lack of public awareness, misperception, and non-compliance with treatment.*

Lack of public awareness about NCDs and the importance of prevention and treatment, as expressed by Participant 6: *"Many patients do not realize the importance of maintaining a healthy lifestyle to prevent diseases such as hypertension and diabetes. They come when the disease is already serious. (P6).* This statement highlights how limited awareness prevents early detection and intervention, contributing to the worsening of patients' conditions by the time they seek care. Health workers could address this challenge by conducting community outreach programs, such as health education campaigns at Posbindu (Abbreviation in Bahasa Indonesia is Pos Pembinaan Terpadu-Penyakit Tidak Menular, which means an integrated guidance post for the early detection and prevention of NCDs), which are designed to increase awareness about NCD prevention and early detection.

In addition, there are public *misperceptions* about NCDs that can hinder prevention or treatment efforts. This was expressed by Participant 9, who stated: *"People often have misperceptions about noncommunicable diseases. They think that these diseases only affect older people, whereas many young patients are also affected. (P9).* This reflects a critical barrier where misconceptions about NCDs limit the population's understanding of risk factors and prevention strategies, potentially delaying treatment for younger individuals. Collaborating with local leaders and leveraging social media platforms can help dispel these misconceptions, spreading accurate information about NCDs to a broader audience.

In addition, *non-compliance with treatment i*s a major challenge in NCD management. This was expressed by Participant 1: *"Many patients are not compliant with long-term treatment. They often stop taking the medication after feeling a little better, and eventually their condition worsens again". (P1)* This highlights how non-compliance undermines the effectiveness of treatment, resulting in poor health outcomes and increased healthcare burdens. Health workers could improve compliance by strengthening patient counseling during consultations and involving family members in supporting long-term treatment adherence. Additionally, initiatives like chronic disease clubs or peer-support groups have been successfully implemented in some regions to encourage consistent treatment and foster a sense of community among patients managing NCDs.

Work area coverage

This theme highlights the geographical challenges and accessibility issues in providing healthcare services related to NCDs. This fourth theme was supported by two sub-themes: *Extent of territory and Accessibility*.

CHCs that serve very large areas often face difficulties in effectively reaching all patients. Participant 10 stated: *"...it's quite overwhelming, serving 23 villages, and most of the time is spent on the road..."(P10).* This statement illustrates the logistical challenges faced by CHCs in managing vast territories, where significant time and resources are consumed in traveling rather than delivering healthcare services, limiting their ability to provide timely and comprehensive care.

In addition, *accessibility* issues include physical infrastructure such as poor roads or long distances to health centres, which affect NCD management at the Puskesmas. Participant 3 expressed this: *"Many patients who live in remote areas are unable to come to the CHCs regularly due to poor road conditions and limited transportation" (P3).* This reflects how inadequate infrastructure and long travel distances create barriers to regular healthcare access for patients, leading to delays in treatment and poorer health outcomes.

The CHCs often serve sparsely populated regions with significant geographic barriers, where patients may need to travel long distances to access care. These sub-themes demonstrate the significant impact of geographical and infrastructural challenges on the effectiveness of NCD management, emphasizing the need for targeted interventions to improve accessibility and coverage in remote areas.

Government policy and support

This theme reflects the role of government policy and support in NCD management. This fifth theme was supported by two sub-themes: *Budget setting and Lack of cross-sectoral coordination.* Participants revealed the limitations in budget allocation from the government to support NCD management programs at the primary healthcare level. Participant 11 expressed this: *"The budget we receive for the management of NCDs is limited. We have to set priorities..." (P11).* This statement highlights how inadequate budget allocation forces healthcare providers to prioritize certain programs over others, potentially leaving key aspects of NCD management underfunded and affecting the overall quality of care.

NCD management in Indonesia is guided by frameworks such as the *National Action Plan for Non-Communicable Diseases (RAN-PPTM),* which emphasizes prevention, early detection, and integrated care for NCDs. Additionally, the *Posbindu* initiative focuses on community-based detection and prevention of NCDs. However, participants indicated that budgetary limitations hinder the effective implementation of these programs, especially at the primary healthcare level.

Additionally, there is a lack of cross-sectoral coordination between various government agencies and organizations in providing comprehensive support for NCD management. This was supported by a statement from Participant 12: *"Coordination between government agencies is still not optimal. For instance, in NCD management programs, support from other sectors such as village governments, education, and community-based initiatives is often lacking." (P12).* This reflects the systemic challenge of poor inter-agency collaboration, which limits the integration of resources and efforts necessary for a comprehensive approach to managing NCDs.

The findings of this study have several immediate implications for practice and policy in NCD management in Indonesia. Addressing resource constraints and fostering interprofessional collaboration are critical steps for improving healthcare delivery. Community engagement efforts also hold significant potential; empowering local leaders, utilizing community health volunteers, and fostering partnerships with community-based organizations can improve public awareness, treatment adherence, and access to healthcare services. These efforts can help bridge the gap between healthcare providers and underserved populations.

Discussion

The findings from this qualitative study reveal significant challenges and barriers impacting the management of non-communicable diseases (NCDs) at community health centers (CHCs) in South Sumatera Province, Indonesia. The results showed five themes: resource constraints in primary healthcare; lack of effective interprofessional collaboration; social and cultural issues; work area coverage; and government policy and support.

Excessive workloads and limited resources hinder effective NCD management, as healthcare providers are overburdened with clinical and administrative tasks, reducing their

ability to offer comprehensive care. The study by Apaydin (22) also argues that administrative duties disrupt primary care delivery and should be delegated to other health workers. Insufficient staff also compromises CHCs' ability to provide consistent long-term care (23). Furthermore, the lack of adequate facilities and equipment further compounds the challenges faced by healthcare workers (24). Inadequate facilities not only limit the ability of CHCs to deliver comprehensive care but also undermine patient trust in the healthcare system, potentially discouraging patients from seeking necessary follow-up care (22, 25).

This study highlights the lack of effective interprofessional collaboration as a critical barrier to NCD management. Lack of communication and coordination among healthcare workers leads to fragmented care and patient confusion (26). Professional egoism and weak synergy further reduce efficiency and consistency in care (13, 27). These findings align with previous research (28), lack of synergy between professions hinders the implementation of interprofessional collaboration. Therefore, strengthening interprofessional collaboration is essential to enhancing service quality and patient outcomes in NCD management (29). To address these challenges, strengthening collaboration through structured frameworks like team meetings and shared care plans, along with training in teamwork and problem-solving, can enhance service quality and patient outcomes (23, 30).

The study revealed social and cultural barriers to NCD management, including traditional beliefs that conflicted with medical advice and low health literacy. These findings align with previous research (31), that socio-cultural aspects influence health knowledge packaged with local knowledge systems on the prevention and treatment of non-communicable diseases. Addressing these issues requires understanding local customs and leveraging community-based programs like Indonesia’s Posyandu and Brazil’s Family Health Strategy, which use health workers to educate and deliver culturally sensitive care (4, 32). These community-based programs provide culturally appropriate interventions and act as a bridge between modern medical systems and traditional beliefs (4, 33).

CHCs face challenges in covering large geographical areas with scattered populations, spending more time traveling than providing direct care. This limitation hindered access to timely and continuous care for NCD patients, particularly those living in remote areas (7). Distance and transportation issues were compounded by a shortage of healthcare workers, making it difficult to reach patients regularly for follow-up and monitoring (12). Previous studies of similar Garchitorena, Ihantamalala (34) showed that rural areas globally face these issues, complicating consistent healthcare delivery. This finding echoes challenges faced by health systems in other rural and remote areas globally, where infrastructure and logistical issues further exacerbate the difficulties in delivering consistent and effective healthcare services (12).

The study highlights insufficient government policy and support as key barriers to effective NCD management. Limited funding restricts CHCs' services, including medication, equipment, staff training, and outreach programs (10). Poor cross-sectoral coordination further fragments efforts to address broader health determinants (7, 13). Programs like Posbindu face challenges such as inadequate funding, insufficient training, and poor integration, especially in rural areas (7). A further area of concern is the Ministry of Health's new policy on primary care integration, which still requires adaptation for implementation in current health services. This aligns with findings by Ansbro, and Issa (25), who showed that underfunding and poor inter-agency collaboration are common barriers in low-resource settings, where integrated approaches are essential for managing chronic conditions like NCDs. Addressing these challenges requires increased government investment in NCD care and stronger collaboration between sectors to implement cohesive and holistic health strategies (13). Strengthening financial support and cross-sectoral coordination will enhance the

effectiveness of NCD management and improve patient outcomes in underserved regions (29).

Future interventions should be designed to be culturally sensitive, particularly in addressing misconceptions and traditional beliefs, by involving local leaders and traditional authorities. To address the workload and geographical challenges faced by CHCs, integrating technology, such as telehealth and mobile health initiatives, could play a pivotal role. In addition, non-health sectors, such as education and community development, can support NCD management by integrating health literacy into school curricula, promoting public awareness campaigns, and improving local infrastructure to enhance healthcare accessibility. Lastly, integrating patient-centered approaches into NCD management strategies involves actively engaging patients in decision-making, tailoring care to individual needs, and incorporating their feedback to address barriers effectively.

The findings of this study are limited to the context of CHCs in South Sumatra Province, Indonesia, and may not be generalizable to other regions or countries. The transferability of these findings identified is influenced by local factors such as ethnicity, culture, geography, healthcare infrastructure, and cultural practices unique to the study area. The challenges and barriers identified in this study indicate that improving NCD management at CHCs in South Sumatra requires a multifaceted approach. Addressing the resource constraints, fostering interprofessional collaboration, mitigating social and cultural barriers, ensuring equitable access to care across large geographical areas, and reinforcing government support are essential steps toward enhancing the quality of care for NCD patients.

These findings provide valuable insights for policymakers and health system managers to develop targeted interventions that can improve NCD outcomes and strengthen primary healthcare services in Indonesia. Future research could focus on comparative studies between South Sumatra and other regions in Indonesia to examine NCD management. These studies would provide insights into region-specific challenges and adaptable strategies for improving NCD care across diverse settings.

Conclusion

This qualitative study provides an in-depth exploration of the challenges and barriers encountered in the management of noncommunicable diseases (NCDs) at community health centers (CHCs) in South Sumatra Province, Indonesia. Improving NCD management at CHCs in South Sumatra requires a multifaceted approach. Addressing resource constraints, fostering effective interprofessional collaboration, mitigating social and cultural barriers, ensuring equitable access across large geographic areas, and strengthening government policy and support are essential steps. These studies provide valuable insights for policymakers and health system managers to develop targeted interventions that can improve NCD outcomes and strengthen primary healthcare services.

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Conflict of interests

The authors declare that they have no competing interests.

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