

Original Research

Pharmacists' roles and barriers in supporting psychiatric medication adherence: An interprofessional qualitative study

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Abstract

Objective: Medication non-adherence among psychiatric patients remains a significant barrier to recovery, contributing to relapse, rehospitalization, and reduced quality of life. This study aimed to explore healthcare professionals' perspectives on adherence barriers and examine pharmacists' perceived roles in supporting psychiatric medication adherence in South Kalimantan, Indonesia. **Methods:** A descriptive qualitative design was employed using two interprofessional focus group discussions (FGDs). A total of twenty participants (8 pharmacists, 5 nurses, 4 psychologists, and 3 doctors) were recruited through purposive sampling. Discussions were audio-recorded, transcribed verbatim, and thematically analyzed following Braun and Clarke's framework. Reporting adhered to COREQ standards. **Results:** Ten major barriers to adherence emerged: medication side effects, forgetfulness, busy routines, intentional non-adherence, limited knowledge, negative perceptions, personal stigma, family influences, cultural-spiritual beliefs, and systemic healthcare constraints. Pharmacists were widely recognized as vital contributors in medication review, patient counseling, and interprofessional collaboration, but their roles were limited by workforce shortages, insufficient mental health training, and inadequate institutional and policy support. **Conclusions:** Psychiatric medication adherence in LMICs is shaped by complex individual, familial, cultural, and systemic factors. Strengthening pharmacists' roles through structured training, supportive policies, and integration into multidisciplinary mental health teams may improve adherence and clinical outcomes.

Keywords: psychiatric medication adherence; pharmacist intervention; mental health; LMIC; Indonesia; cultural competence

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INTRODUCTION

Mental health disorders such as depression, schizophrenia, and bipolar disorder are among the leading contributors to the global burden of disease and disability¹. Although effective pharmacological treatments are available, non-adherence to psychiatric medication remains a persistent challenge, often leading to relapse, hospitalization, suicide risk, and impaired quality of life²⁻⁶. Multiple factors contribute to poor adherence, including forgetfulness, uncertainty about dosage, adverse effects, limited awareness, low health literacy, and cultural-spiritual beliefs that prioritize prayer or traditional rituals over pharmacological treatment⁷⁻¹¹.

The burden of mental disorders is particularly significant in low- and middle-income countries (LMICs), where resources for psychiatric care are limited, stigma remains pervasive, and access to trained professionals is inconsistent³⁻⁵. In Indonesia, mental health has increasingly been recognized as a critical component of population well-being, educational attainment, and social productivity¹²⁻¹⁶. However, non-adherence continues to undermine treatment outcomes, indicating a need for context-sensitive and sustainable interventions¹⁷. Cultural factors—such as spiritual interpretations of mental illness and community reliance on religious or traditional healers—further complicate adherence behavior and continuity of care^{10,11}.

Pharmacists, as accessible healthcare professionals, are well positioned to support patients with psychiatric conditions. Their professional roles extend beyond dispensing to include medication review, monitoring, counseling, prevention of inappropriate psychotropic use, and interprofessional education. Through collaborative practice, pharmacists can enhance medication safety, optimize treatment, and reinforce adherence messages across care settings. Despite this potential, pharmacists' contributions to psychiatric care in LMICs remain underexplored. In Indonesia, their participation is often limited by workforce shortages, insufficient mental health training, and lack of institutional and policy support¹⁸⁻²¹.

South Kalimantan provides a relevant case study due to its cultural diversity, population distribution, and structural health service challenges. Understanding how pharmacists' roles are perceived in this setting is crucial for developing interventions that are both clinically effective and culturally aligned with local beliefs and healthcare delivery contexts.

Therefore, this study aimed to explore healthcare professionals' views on the barriers to psychiatric medication adherence and



to examine the perceived roles and challenges of pharmacists in supporting adherence within mental health care services in South Kalimantan, Indonesia.

METHODS

Study Design

This study employed a descriptive qualitative design using focus group discussions (FGDs) to explore healthcare professionals' perspectives on pharmacists' roles and barriers to psychiatric medication adherence. The FGD method was chosen because it enables in-depth exploration of shared experiences, encourages interactive discussions, and facilitates conceptual mapping of professional viewpoints^{22,23}. The study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) to ensure rigor, transparency, and credibility throughout all research stages²⁴.

To minimize social desirability bias, several methodological safeguards were implemented. Participants were assured that all transcripts would be anonymized and that identifying information would be removed prior to analysis. The moderator used neutral, non-judgmental questioning techniques and framed prompts around participants' lived experiences rather than ideal or "correct" professional practices. At the beginning of each session, participants were explicitly informed that there were no right or wrong answers and were encouraged to share candid perspectives. All data were handled confidentially in accordance with approved ethical procedures.

Setting

The study was conducted in South Kalimantan, Indonesia which represent urban, and rural settings. These regions were selected due to their differing population densities, healthcare infrastructures, and cultural contexts, providing diverse insights into the challenges of psychiatric medication adherence and interprofessional collaboration.

Setting Participants and Sampling

Participants were recruited purposively to ensure diversity across professions (pharmacists, doctors, nurses, and psychologists) and practice settings (primary care, hospitals, and community mental health services). Recruitment began with key informants experienced in mental health practice, followed by snowball sampling to identify additional eligible participants. All invited participants provided written informed consent prior to joining the study.

A total of 20 participants (8 pharmacists, 5 nurses, 4 psychologists, and 3 doctors; aged 32–55 years) took part in the FGDs. Each participant received an honorarium of IDR 250,000 as compensation for their time. Detailed participant characteristics are presented in Table 1 and Table 2.

Data Collection

Two interprofessional FGDs were conducted in August 2024. The first FGD included participants from urban areas of South Kalimantan (Banjarmasin and Banjarbaru), whereas the second FGD included participants from rural area (Barito Kuala Regency). Each session lasted approximately 90 minutes

and was facilitated by a trained moderator, supported by a note-taker. The FGDs were moderated by HA, a qualitative researcher with training in mental health communication. The moderator had no supervisory or evaluative relationship with participants, minimizing hierarchical influence. Discussions were guided by a semi-structured interview protocol developed by the research team (Appendix 1). Prior to data collection, participants were briefed on the study's objectives and ethical principles, including voluntary participation and confidentiality assurances.

All discussions were audio-recorded with participants' consent. Field notes were taken to capture non-verbal cues and contextual observations. Participant identities were anonymized in transcripts. Although repeat interviews were not feasible due to participants' professional workload, data saturation was achieved when no new themes emerged after iterative probing^{25,26}. Data analysis was conducted concurrently with data collection. After the second FGD, no substantially new themes emerged, indicating thematic saturation.

To enhance rigor, triangulation across professional groups and member checking were conducted both during and after the FGDs. Participants reviewed the summarized statements and preliminary findings to verify accuracy and ensure that interpretations reflected their perspectives. These strategies enhanced the study's credibility, dependability, and trustworthiness.

Data Analysis

Data were analyzed using the six-phase thematic analysis framework proposed by Braun and Clarke, allowing systematic identification of themes and subthemes. One researcher (HA), a practicing community pharmacist trained in qualitative methods, transcribed and coded all data. The second researcher (CW), a pharmacist and academic researcher with a PhD in pharmacy practice, independently coded a random 25% of the transcripts to ensure coding reliability. Reflexivity was maintained throughout the process to minimize personal bias. The research team consists of pharmacy academics with experience in mental health services. While this background facilitated contextual understanding, reflexive practices including memo-writing, peer debriefing, and audit trail documentation were employed to minimize interpretive bias. Both researchers (HA and CW) conducted inductive coding using Microsoft Word®. Codes were refined through iterative discussions, leading to the development of a coding framework (Appendix 2). Emerging patterns were reviewed with the wider research team (HA, YSP, SI, and CW) to generate final themes. NVivo 14 software was used to visualize thematic relationships and produce a thematic map (Figure 1). Representative participant quotes were translated into English to illustrate each theme.

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of Universitas Muhammadiyah Banjarmasin (Approval No. 495/UMB/KE/VIII/2024). Written informed consent was obtained from all participants prior to data



Table 1. Individual Characteristics of FGD participants (n = 20)		
Characteristics		n
Gender	Male	2
	Female	18
Age (years)	<39	5
	39-40	6
	41-42	6
	>42	3
Professional Features	Pharmacist	8
	Psychologist	4
	Nurse	5
	Doctor	3
Working Place	Barito Kuala	3
	Banjarbaru	7
	Banjarmasin	10

Table 2. Demographic characteristics of participants		
Participant Code	Gender	Professional Features
FGD1/P1	Female	Pharmacist
FGD1/P2	Female	Pharmacist
FGD1/PS1	Female	Psychologist
FGD1/P3	Female	Pharmacist
FGD1/PS2	Female	Psychologist
FGD1/N1	Female	Nurse
FGD1/D1	Female	Doctor
FGD1/P4	Female	Pharmacist
FGD1/N2	Female	Nurse
FGD1/N3	Female	Nurse
FGD1/P5	Female	Pharmacist
FGD1/PS3	Female	Psychologist
FGD1/N4	Female	Nurse
FGD2/P6	Female	Pharmacist
FGD2/P7	Female	Pharmacist
FGD2/PS4	Female	Psychologist
FGD2/N5	Female	Nurse
FGD2/P8	Men	Pharmacist
FGD2/D2	Female	Doctor
FGD2/D3	Men	Doctor

Note: FGD, Focus Group Discussion; P, Pharmacist; PS, Psychologist; N, Nurse; D, Doctor

collection. Only the research team had access to raw data, which were stored securely and used solely for research purposes.

RESULTS

Participant characteristics

A total of 20 healthcare professionals participated in the study, comprising eight pharmacists, five nurses, four psychologists, and three doctors. Participants' ages ranged from 32 to 55 years, with a mean of 40.6 years (SD = 4.32). Most participants were female (90%). They represented various healthcare settings, including hospitals, primary health centers, and community mental health services across three districts in South Kalimantan—Banjarmasin, Banjarbaru, and Barito Kuala—ensuring a diversity of perspectives and contextual experiences (Table 1 and Table 2).

Barriers to Psychiatric Medication Adherence

Participants described psychiatric medication adherence as a multidimensional challenge influenced by individual, familial, cultural, and systemic factors. Ten main barriers were identified through thematic analysis (Table 3).

At the individual level, the most common barriers were medication side effects, forgetfulness, and demanding daily routines. Participants noted that drowsiness, constipation, tremors, or emotional numbness often discouraged patients from continuing treatment. For example, one doctor explained,

“...For instance, amitriptyline has strong sedative effects, so it's no surprise that patients using this medication reported feeling very drowsy. Some skipped their doses when they had to work...” (FGD2/D2)

Similarly, pharmacists observed that unpleasant side effects, such as nausea or sexual dysfunction, prompted intentional discontinuation.

Forgetfulness and carelessness, especially among older adults, also contributed to non-adherence, as noted by a doctor:

“...They tend to forget where they placed their medications or when to take them, and experience disorganized thinking...” (FGD2/D2)

Busy routines and fatigue were also mentioned, with several patients missing doses due to work-related exhaustion:

“...Some patients admitted they missed their medications due to busy schedules or fatigue from daily routines...” (FGD1/P1)

Intentional non-adherence occurred when patients perceived improvement or felt that continuous medication was unnecessary:

“...Patients said they would intentionally skip doses, only

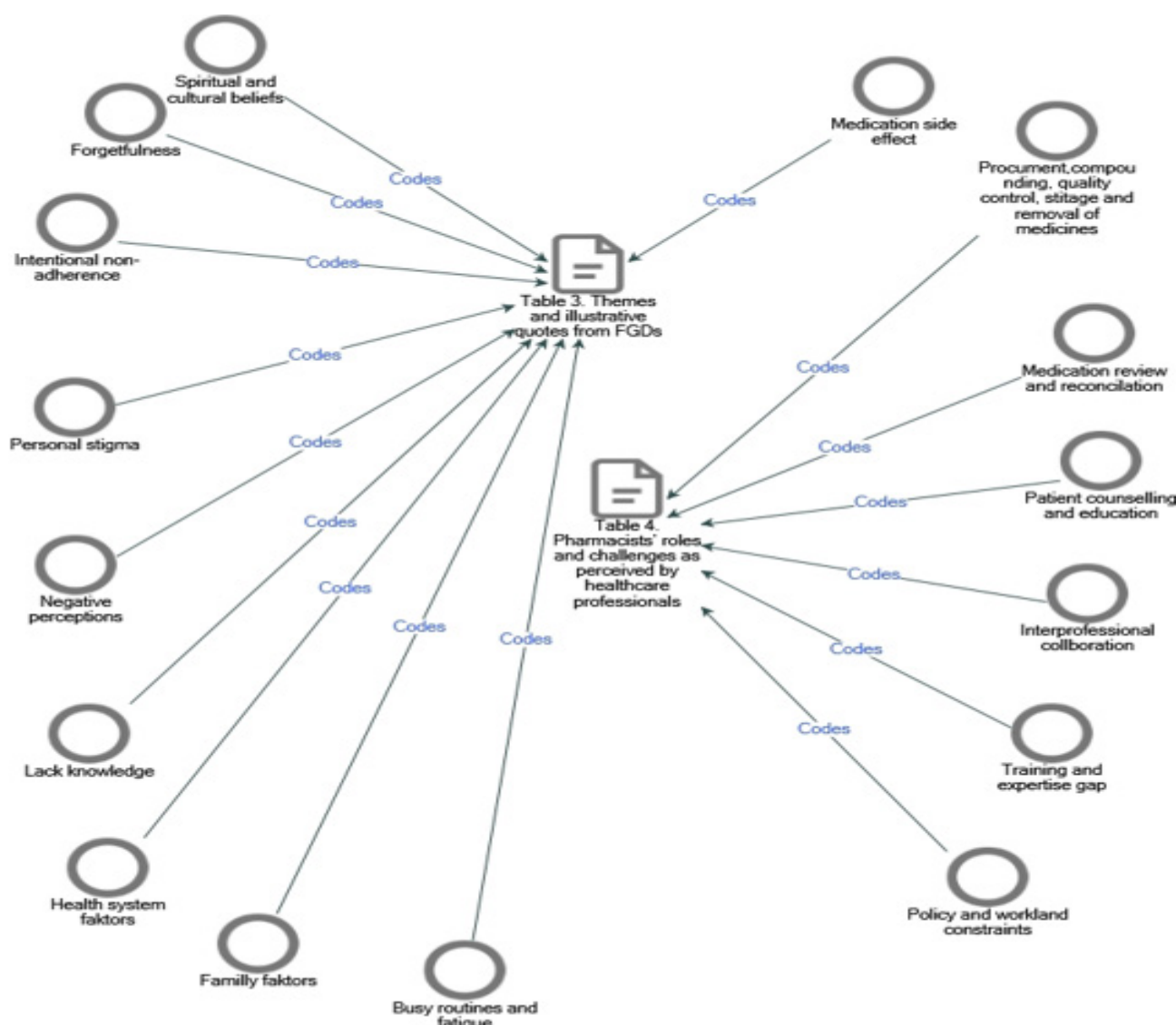


Figure 1. Theme Visualization Based on FGD Results (Source: N-ViVo 14)

taking medication when they felt it was necessary..." (FGD1/P5)

Knowledge gaps were another major determinant. Many patients misunderstood the duration and purpose of psychiatric therapy:

"...Patients don't understand that treatment for mental illnesses can last for months or even years. They think it's enough to take medication for just a few weeks..." (FGD2/PS4)

At the interpersonal level, family influence and personal stigma were critical. Families could either support adherence through reminders and encouragement or discourage it due to misconceptions about addiction or side effects:

"...Many patients relapse because their families tell them to stop taking medications out of fear of side effects or addiction..." (FGD2/D2)

Personal stigma—shame, fear of social judgment, and reluctance to disclose mental illness—led to concealment and treatment discontinuation:

"...They feel embarrassed about having to rely on medication and internalize this stigma..." (FGD1/N2)

Cultural and spiritual beliefs also shaped medication practices. Several participants described patients' reliance on religious or traditional healing:

"...Patients and families believe illnesses can be cured through faith or spiritual healing from local religious leaders..." (FGD2/D2)

At the structural level, health system barriers included long waiting times, bureaucratic BPJS procedures, and limited consultation opportunities:

Table 3. Barriers in Supporting Psychiatric Medication Adherence		
Domain	Barrier	Illustrative Description
Medication-related	Medication side effects	Drowsiness, nausea, tremors, constipation, sexual dysfunction, and emotional numbness discouraged continued treatment.
	Lack of knowledge	Limited understanding of the need for long-term antidepressant therapy and delayed therapeutic effects.
	Negative perceptions	Concerns about kidney damage, drug dependence, or addiction reduced willingness to continue medication.
Patient-related	Forgetfulness and carelessness	Patients, particularly older adults, frequently forgot dosing schedules or misplaced medications.
	Busy routines and fatigue	Daily responsibilities and physical exhaustion interfered with regular medication use.
	Intentional non-adherence	Patients deliberately discontinued medication after symptom improvement without consulting healthcare professionals.
	Personal stigma	Fear of social judgment and feelings of shame discouraged treatment continuation.
Family-related	Family factors	Family members could either encourage adherence or discourage continued treatment depending on their beliefs and attitudes.
Socio-cultural	Spiritual and cultural beliefs	Preference for spiritual healing, traditional medicine, or paranormal treatment over biomedical care.
Health system-related	Health system factors	Long waiting times, brief consultations, and administrative barriers within the BPJS system reduced treatment satisfaction and continuity.

“...They expressed dissatisfaction with the BPJS system, which requires psychiatric patients to visit government hospitals and follow a complex process, including long queues...” (FGD2/D3)

Collectively, these barriers reflect an interrelated network of individual, family, cultural, and systemic influences that jointly shape adherence behavior among psychiatric patients in South Kalimantan.

Pharmacists’ Roles and Challenges in Mental Health Care

Figure 1 presents a thematic visualization of these relationships, summarizing the key barriers and pharmacist roles identified through NVivo analysis. Pharmacists were consistently recognized as valuable contributors to psychiatric care through medication review, counseling, patient education, and participation in interprofessional teams (Table 4). They played active roles in ensuring medication safety, addressing patient concerns, and supporting rational prescribing.

A nurse explained:

“...Pharmacy services decrease medication errors while simultaneously increasing motivation and adherence...” (FGD1/N1)

A psychologist further noted:

“...Pharmacists are the ones who can explain side effects clearly to patients...” (FGD2/P6)

Pharmacists also facilitated interprofessional collaboration by providing updated drug information and contributing to medication decision-making:

“...Pharmacists support us with updated information and guide rational prescribing...” (FGD2/D2)

However, participants emphasized several systemic and institutional barriers that limited pharmacists’ impact. These included limited training in mental health, shortages of pharmacy staff, heavy documentation workloads, and weak policy support for their integration into mental health teams:

“Pharmacists lack adequate training in mental health ... their preparation is often insufficient.” (FGD1/N2)

“...The time and documentation limitations faced by pharmacists represent major obstacles to effective interprofessional communication...” (FGD2/P7)

These findings illustrate that while pharmacists are recognized as essential members of the multidisciplinary team, their roles in psychiatric care remain underdeveloped due to structural, educational, and policy constraints

DISCUSSIONS

Statement of Key Findings

This study identified a complex interplay of individual, familial,



cultural, and systemic factors influencing psychiatric medication adherence in South Kalimantan, Indonesia. Ten major barriers emerged, including medication side effects, forgetfulness, busy routines, intentional non-adherence, limited knowledge, negative perceptions, stigma, family influences, spiritual-cultural beliefs, and healthcare system constraints (Figure 2).

Pharmacists were widely recognized as important contributors to medication review, patient counseling, and interprofessional collaboration. However, their capacity to support adherence was constrained by limited training in mental health, workforce shortages, high administrative workload, and insufficient institutional and policy support. These findings highlight the multifactorial and context-specific nature of psychiatric non-adherence in low- and middle-income country (LMIC) settings.

This aligns with El den et al. (2021), who emphasized pharmacists' critical role in education, medication monitoring, and integration within mental health teams.²⁷ Community-based research (2022) identified limited training, insufficient system integration, and unsupportive policies as major barriers to pharmacists' effective engagement²⁸. Our findings regarding inadequate training, high workload, and minimal policy support are consistent with international literature, indicating that, despite being recognized as essential members of the healthcare team, pharmacists' contributions remain structurally constrained.

The findings are consistent with global evidence showing that psychiatric medication non-adherence is a persistent challenge shaped by multiple determinants. A recent meta-analysis reported that the prevalence of psychotropic non-adherence in LMICs reached approximately 46%, driven by negative attitudes toward medication, stigma, poor insight, and adverse effects²⁹. Similar to previous studies, this research found that patients often discontinued therapy due to side effects, perceived inefficacy, and cognitive limitations^{30–33}. Family influence and personal stigma, also identified here, align with prior studies emphasizing social and familial roles in adherence behavior^{34,35}.

Aaltonen et al. (2010) highlighted that barriers in medication counseling for patients with mental disorders arise from patient-related, pharmacist-related, and healthcare system factors³⁶. Lizer et al. (2011) indicated that pharmacist interventions can improve psychiatric medication adherence, yet patients still face challenges due to side effects and negative perceptions³⁷. Moreover, Nianmongkon et al. (2024) found that the use of smartphone applications in conjunction with pharmacy counseling can enhance adherence in patients with major depression³⁸. These results support our findings that individual factors—such as side effects, forgetfulness, and busy schedules—can be addressed through structured interventions combining education and digital technology.

The influence of family and personal stigma is also consistent with the literature. Other studies show that social interactions, perceived stigma, and the role of family can significantly affect patients' decisions to follow therapy. Cultural and spiritual fac-

tors—such as beliefs in healing through prayer or local religious leaders—underscore the importance of interventions that are sensitive to cultural context, as noted in other LMIC literature (Nianmongkon et al., 2024)³⁸.

Cultural and spiritual factors identified in this study echo findings from LMICs where religious or traditional beliefs frequently compete with biomedical treatment^{31,39}. Such beliefs may lead patients and families to prioritize prayer, rituals, or traditional healers over prescribed medications, underscoring the importance of culturally responsive adherence interventions.

Regarding pharmacists' roles, this study reinforces growing evidence that pharmacists can play significant roles in mental health care through medication review, patient education, and interprofessional collaboration^{40,41}. In Indonesia and similar LMICs, pharmacists' roles remain underdeveloped compared to high-income countries where they are more integrated in psychiatric care programs^{42–45}. The recognition of pharmacists as trusted, accessible health professionals positions them strategically to improve treatment adherence through counseling, motivational support, and safety monitoring^{46–50}. However, systemic barriers such as inadequate training and workload constraints continue to limit their contribution⁵¹.

The findings also resonate with studies from Asia and Africa highlighting the importance of pharmacist-led interventions in chronic and mental health conditions^{52–57}. In Indonesia, initiatives like the Si-Care (Schizophrenia Care) model in Banjarmasin demonstrated that pharmacist-led adherence programs can improve patient outcomes and reduce relapse rates⁵⁷. Similarly, research in New Zealand and Europe confirms that pharmacist-physician collaborative models enhance adherence and patient experience^{58,59}. These parallels strengthen the argument for pharmacist integration within multidisciplinary mental health teams in Indonesia.

Overall, these results highlight the importance of culturally sensitive, structured interventions that integrate patient education, digital tools, and pharmacist-led support while addressing systemic barriers to optimize psychiatric medication adherence and mental health outcomes.

Interpretation and Implications

Conceptual Integration Within Task-Sharing and Behavioral Frameworks

To further contextualize these findings, the identified barriers can be interpreted within established theoretical frameworks. From a WHO task-sharing perspective, pharmacists represent an underutilized non-specialist workforce capable of contributing to adherence support when supported by structured protocols and referral pathways. This aligns with global mental health strategies emphasizing redistribution of roles in LMIC settings.

The multilevel nature of the identified barriers reflects the Social Ecological Model, operating across individual



Table 4. Summary of Healthcare Professionals' Perceptions of Pharmacists' Roles and Challenges	
Category	Interpretation
Medication safety	Pharmacists were viewed as ensuring safe antidepressant use through medication review, reconciliation, and prevention of medication-related problems.
Patient education	Pharmacists played an important role in educating patients about depression treatment, managing side effects, and improving medication adherence.
Collaborative care	Pharmacists contributed to multidisciplinary care by supporting prescribing decisions, monitoring therapeutic outcomes, and communicating with other healthcare professionals.
Medication management	Pharmacists maintained medicine availability through procurement, compounding, quality assurance, storage, and disposal activities.
Professional competency challenges	Limited mental health training and communication competencies constrained pharmacists' involvement in depression care.
Health system challenges	High workload, administrative responsibilities, limited consultation time, and insufficient organizational support hindered optimal service delivery.

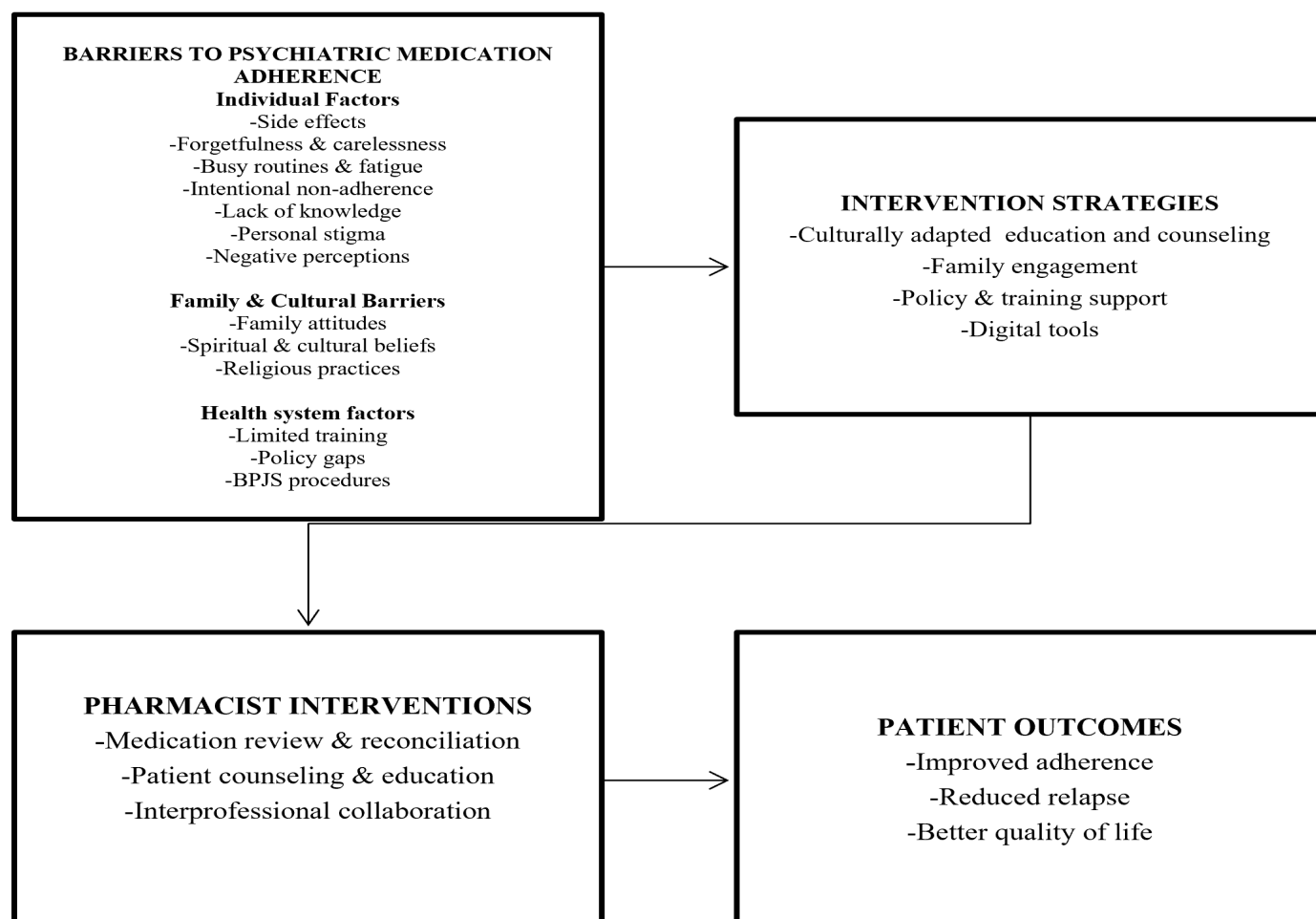


Figure 2. Conceptual Framework: Roles and Barriers in Psychiatric Medication Adherence

(knowledge, stigma), interpersonal (family influence), organizational (workload, consultation space), and system-level (policy and referral pathways) domains. In addition, the COM-B model helps explain how adherence is shaped by Capability (knowledge gaps), Opportunity (structural and stigma-related barriers), and Motivation (beliefs about dependency and severity). Patient concerns regarding side effects and long-term treatment also align with constructs of the Health Belief Model, particularly perceived barriers and perceived benefits. Taken together, these frameworks provide conceptual coherence to the findings without extending beyond the empirical data.

Implications for Practice and Policy

This study highlights the complex socio-cultural and systemic dynamics shaping psychiatric medication adherence in Indonesia. Beyond individual and clinical factors, adherence is influenced by stigma, family attitudes, and spiritual beliefs, emphasizing the need for culturally grounded interventions.

Pharmacists represent a strategic opportunity to address these multidimensional barriers. Expanding their clinical roles through structured training in psychopharmacology, patient-centered communication, and counseling could enhance adherence support at both hospital and community levels. Integrating pharmacists into multidisciplinary teams aligns with WHO's vision of task-sharing and interprofessional collaboration to strengthen mental health services in LMICs.

Policy makers should prioritize pharmacist inclusion in national mental health frameworks, establish standardized competencies for psychiatric pharmacy practice, and ensure continuous professional development. Institutional reforms supporting adequate staffing and workload redistribution would also enable pharmacists to devote more time to patient interaction and adherence monitoring.

Pharmacist-led interventions can serve as an effective strategy to overcome multidimensional barriers to psychiatric medication adherence. Structured training in psychopharmacology, patient-centered communication, and counseling enhances pharmacists' capacity to monitor patients and promote adherence. Integrating pharmacists into interdisciplinary teams aligns with WHO recommendations on task-sharing and interprofessional collaboration, supporting the strengthening of mental health services in LMICs.

Digital tools, such as educational videos and adherence-monitoring applications, can assist patients in remembering doses and appreciating the importance of long-term therapy. In addition, culturally tailored approaches and active family involvement are essential to reduce stigma and improve adherence within the Indonesian context.

Strengths and Limitations

A major strength of this study lies in its interprofessional qualitative design, which enabled rich exploration of perspectives

from pharmacists, doctors, nurses, and psychologists. Thematic analysis guided by COREQ enhanced rigor, reflexivity, and transparency.

However, several limitations should be acknowledged. While mixed-profession FGDs enriched interprofessional perspectives, hierarchical dynamics may have influenced participant openness despite structured facilitation strategies. The use of purposive sampling and inclusion of participants from a single province may limit the transferability of findings to other Indonesian regions. Time constraints prevented repeat interviews, although data saturation was achieved through triangulation and member checking. Despite these limitations, the study provides robust, contextually grounded insights into the intersection of culture, health systems, and professional roles in psychiatric medication adherence.

Future Directions and Practical Implications

Future research should evaluate the effectiveness of pharmacist-led adherence interventions, including digital adherence tools, psychoeducation modules, and family-based approaches tailored to local culture. Collaborative research with psychiatrists and policy stakeholders is needed to design scalable pharmacist-led adherence models integrated into national mental health programs.

From a practice perspective, our findings highlight the need for three structural enablers: (1) standardized mental health counseling protocols within pharmaceutical care, (2) interprofessional referral pathways with clearly defined role boundaries, and (3) targeted communication training focused on stigma-sensitive dialogue. Without these supports, pharmacist involvement risks remaining informal and inconsistent. Embedding mental health adherence support into pharmacy practice standards may enhance sustainability and scalability across similar resource-constrained health systems.

Empowering pharmacists to assume more active clinical roles can serve as a cost-effective strategy to reduce relapse, improve quality of life, and optimize mental health outcomes in LMIC contexts. Culturally adapted interventions that involve family engagement and stigma reduction will be essential for achieving sustainable improvements in adherence and recovery.

Key Messages for Practice and Policy

1. Psychiatric medication non-adherence in Indonesia is shaped by interconnected individual, familial, cultural-spiritual, and health system barriers.
2. Pharmacists are recognized as trusted professionals capable of enhancing adherence through education, medication review, and collaboration—but remain underutilized.
3. Structured mental health training, supportive regulation, and interprofessional integration are essential to strengthen pharmacists' roles.



4. Culturally grounded pharmacist-led interventions addressing stigma and family engagement can significantly improve adherence in LMIC settings.

CONCLUSIONS

This study demonstrates that psychiatric medication non-adherence in South Kalimantan, Indonesia arises from a combination of individual, familial, cultural-spiritual, and systemic factors. Pharmacists are recognized as key healthcare professionals with the potential to enhance adherence through counseling, medication review, and interprofessional collaboration. However, their roles remain underdeveloped due to inadequate training, high workloads, and limited institutional and policy support.

Strengthening pharmacists' integration within multidisciplinary mental health teams, supported by structured training in psychiatric care and culturally responsive interventions, could substantially improve medication adherence, patient outcomes, and the overall quality of mental health services in Indonesia. These findings provide actionable insights for policymakers, educators, and practitioners aiming to optimize psychiatric care in low- and middle-income countries (LMICs).

Taken together, our findings suggest that pharmacist engage-

ment in psychiatric adherence support should not be conceptualized as professional role expansion alone, but as a system-level optimization strategy. In settings with limited psychiatric workforce capacity, pharmacists represent one of the most frequent and accessible health contacts for patients receiving antidepressants. Institutionalizing structured adherence counseling within pharmacy workflows could reduce treatment discontinuation, mitigate stigma-related drop-out, and strengthen continuity of care. This reframing situates pharmacists as integral contributors to closing the mental health treatment gap rather than peripheral supporters.

AUTHOR CONTRIBUTION

All authors contributed significantly to the conception and design of the study, data collection, analysis, and interpretation. HA led the data collection and drafting of the manuscript; CW, YSP, and SI provided critical revisions and contributed to the interpretation of findings. All authors approved the final version for submission and accept responsibility for the integrity of the work in accordance with the ICMJE (International Committee of Medical Journal Editors) guidelines.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest in relation to this research.

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Appendix 1. Semi-Structured Interview Protocol

Pharmacists' Roles and Barriers in Supporting Psychiatric Medication Adherence: Interprofessional Perspectives from Indonesia

Interview Guide

Instructions to Interviewer:

This interview will be conducted with healthcare professionals such as doctors, pharmacists, nurses, and psychologists who are participating in the study. The interview will explore health professionals' perspectives on the role of pharmacists in supporting medication adherence among psychiatric patients and aim to identify barriers influencing adherence. The interview can be conducted face-to-face at a mutually agreed time. Please note that this guide is intended only to assist interviewers; it is not meant to be prescriptive. Therefore, the order of questions may change, and some questions may be omitted.

Introduction

Introduce yourself. Thank you for your time. The purpose of this interview is to ask about your perspective regarding the role of pharmacists in mental health services and the challenges faced by people living with mental illnesses in medication adherence. We also want to hear about positive outcomes from your collaboration with pharmacists in providing care for patients with mental illnesses, as this will help us in the implementation of future services. We appreciate your honest input and contributions. Everything you share will be kept strictly confidential, and your identity will be protected. You are free to skip any questions you do not wish to answer or to end the interview at any time.

The interview should take about 90 minutes.

Have you read the information sheet?

- NB. If participant has not read the sheet, discuss the information sheet

Do you have any questions about the interview?

- Answer all questions

Are you happy for me to commence recording of the consent process?

- If not, will need written consent.

Read out consent form. If the participant does not wish the interview to be recorded, recording needs to stop and handwritten notes made.

START INTERVIEW

Interview Guide:

Section A. Demographics – please complete this section for all interviewees

1. Could you please share your professional background (e.g., pharmacist, nurse, doctor, psychologist)?
2. May I ask your age?



3. Could you specify your current workplace or practice setting?

Section B. Perceptions of Psychiatric Medication Adherence

4. In your experience, what are the most common challenges patients face in adhering to psychiatric medications?
5. How do patients and families usually respond to long-term psychiatric treatment?

Section C. Pharmacists' Roles

6. In your opinion, what role do pharmacists currently play in supporting psychiatric patients' adherence?
7. Can you share an example where pharmacists contributed positively to patient outcomes?
8. What limitations or barriers do pharmacists face in providing adherence support?

Section D. Interprofessional Collaboration

9. How do pharmacists collaborate with doctors, nurses, or psychologists in managing psychiatric patients?
10. What opportunities exist to strengthen pharmacists' contributions within multidisciplinary teams?

Section E. Improvement Strategies

11. What strategies or interventions would you recommend to improve psychiatric medication adherence in your setting?
12. How should pharmacist training or policy support be improved to address these issues?

Closing Question:

13. Is there anything else you would like to add regarding the role of pharmacists in mental health care or challenges with psychiatric medication adherence?

Thank you for taking the time to talk with us today. We very much appreciate your contribution to this research.

Stop recording

Would you like a copy of the transcript? Please also provide your email address.



Appendix 2. Coding Framework for Thematic Analysis

The thematic analysis followed Braun & Clarke's six-step framework. Codes were generated inductively from the transcripts and clustered into broader categories to form themes. Table A2.1 presents the coding framework, including main themes, subthemes, code examples, and representative quotes from the FGDs.

Table A2.1 Coding Framework for Thematic Analysis

Theme	Subtheme / Code	Description	Illustrative Quote
Barriers to Adherence	Medication side effects	Drowsiness, nausea, tremors, constipation, sexual dysfunction, emotional numbness discouraged patients from continuing therapy.	<p>"For instance, amitriptyline has strong sedative effects, so it's no surprise that patients using this medication reported feeling very drowsy. Some patients skipped their doses when they had to work, especially those working as shopkeepers, online motorcycle taxi drivers, or construction workers." (FGD2/D2)</p> <p>"Patients often feel very uncomfortable and struggle with taking medications regularly due to constipation after using the medication." (FGD1/P3)</p> <p>"One patient confessed to me that they could no longer feel any positive or negative emotions — what they described as emotional numbness — and dropped out of treatment as a result." (FGD2/D3)</p> <p>"There are also patients who felt that the medications prescribed didn't significantly improve their symptoms. I observed how the patient took their medication — they often made mistakes because they decided on their own when to take it. For them, the medication seemed ineffective, so they didn't see the point." (FGD2/P8)</p>
	Forgetfulness & carelessness	Patients, especially the elderly, often forgot dosage schedules or misplaced medication.	"They tend to forget where they placed their medications or when to take them, and experience disorganized thinking. One of my patients, around 80 years old, had this issue." (FGD2/D2)
	Busy routines & fatigue	Daily workload and exhaustion hindered adherence.	"Some patients have admitted to me that they missed their medications due to their busy schedules or fatigue from daily routines." (FGD1/P1)
	Intentional non-adherence	Patients deliberately skipped medication when symptoms improved.	"Patients said they would intentionally skip doses, only taking medication when they felt it was necessary." (FGD1/P5)

	Lack of knowledge	Limited understanding of long-term therapy requirements.	<p>"Patients don't understand that treatment for mental illnesses like depression or schizophrenia can last for months or even years. They think it's enough to take medication for just a few weeks. Some never return after two weeks of treatment." (FGD2/PS4)</p> <p>"Many don't understand the purpose of maintenance therapy." (FGD2/N5)</p> <p>"A patient once told me they didn't realize the medication was meant to prevent relapse — even though they had been educated that long-term maintenance was necessary." (FGD1/D1)</p> <p>"One patient's husband outright refused further treatment for his depressed wife because he believed the medication made her weak." (FGD1/P2)</p> <p>"One patient told me: 'I feel cured, so I stopped taking my medication'" (FGD1/PS1)</p> <p>In reality, sudden discontinuation can lead to relapse or withdrawal symptoms.</p>
	Negative perceptions	Misbeliefs about kidney damage, dependence, or addiction.	<p>"Patients think psychiatric medications are harmful to their kidneys or worry about becoming dependent on them." (FGD2/P6)</p> <p>"Patients have the misconception that psychiatric drugs are addictive if taken regularly." (FGD1/P4)</p> <p>"Some patients report that medications reduce their concentration or make them feel foggy, so they avoid taking them." (FGD1/N1)</p> <p>"Some patients don't believe they are mentally ill and refuse to take medications." (FGD2/D3)</p>
	Personal stigma	Shame and fear of social judgment led to non-disclosure and discontinuation.	<p>"They feel embarrassed about having to rely on medication and internalize this stigma" (FGD1/N2)</p>

	Family factors	Both supportive and discouraging roles from family were reported.	<p>"Patients accompanied by their family members during outpatient visits are usually more adherent to medications." (FGD2/D3)</p> <p>"If families understand the patient's condition and the importance of medication, they help remind and monitor the treatment." (FGD2/P7)</p> <p>"Many patients relapse because their families tell them to stop taking medications out of fear of side effects or addiction." (FGD2/D2)</p> <p>"Patients with supportive families are more open during counseling, making education easier." (FGD1/N3)</p> <p>Emotional support from family helps patients be more cooperative and receptive to health education" (FGD1/PS3)</p> <p>"Patients who live alone or have uncaring families tend to take medications irregularly." (FGD1/N4)</p> <p>"Family education is essential because they are the ones who are with the patient most of the time." (FGD1/PS2)</p> <p>"Sometimes patients refuse medication because their family also stigmatizes them, saying things like, 'You're not really sick, why keep taking meds?'" (FGD1/D1)</p>
	Spiritual & cultural beliefs	Reliance on spiritual healing or paranormal approaches over biomedicine.	<p>"Patients and families have the belief or conviction that illnesses can be cured through faith in paranormal beings." (FGD1/PS1)</p> <p>"There are also those who believe that water that has been blessed with prayers from local religious leaders or scholars can restore their condition." (FGD2/D2)</p>
	Health system factors	Long queues, short consultations, and BPJS procedures created dissatisfaction.	<p>"They expressed dissatisfaction with the BPJS system, which requires psychiatric patients to visit government hospitals and follow a complex process, including waiting lists." (FGD2/D3)</p> <p>"Patient's dissatisfaction with the limited consultation time and the availability of healthcare providers when patients needed thorough information and counseling." (FGD2/P8)</p>

Pharmacists' Roles	Medication review & reconciliation	Ensuring safety, reducing errors	<p>"Clinical pharmacists play an active role ... by reconciling the patient's medication history and helping us in deciding the best medication." (FGD2/D3)</p> <p>"Among pharmacy services are compounding, ensuring the safety and efficacy of medications, and minimizing the possibility of negative side effects and drug interactions. (FGD1/P1)</p>
	Patient counseling & education	Explaining side effects, motivating adherence	<p>"Pharmacists are the ones who can explain side effects clearly to patients." (FGD2/P6)</p> <p>"Pharmacy services decrease medication errors while simultaneously increasing taking-medication motivation and adherence." (FGD1/N1)</p>
	Interprofessional collaboration	Supporting prescribing, monitoring therapy	<p>"Pharmacists support us with updated information and guide rational prescribing." (FGD2/D2)</p> <p>"... I advise doctors to select medications with a broad therapeutic index in order to meet the patient's therapeutic goal while also ensuring drug safety." (FGD2/P6)</p> <p>"We highly value pharmacist-led medication monitoring mainly because it enables nurses peace of mind that patients are getting the right care" (FGD2/N5)</p> <p>"Due to their ability to intervene and offer advice, pharmacists play a significant role in ward rounds. They can offer medication advice in order to support the reinforcement of important messages that enhance patients' adherence and treatment results. Additionally, they independently look for solutions to any issues or problems we bring. (FGD2/PS4)</p>
	Procurement, compounding, quality control, storage and removal of medicines	Securing availability, compounding	<p>"Overall, the ability of pharmacists to recognize and avoid empty medications and provide solutions with approximately effectiveness ensures that patient care is adequately covered." (FGD1/D1)</p> <p>".....pharmacists may identify variations in compounded medication dosage by considering body weight." (FGD2/D2).</p>
Challenges	Training & expertise gap	Lack of mental health-specific training	"Pharmacists lack adequate training in mental health ... their preparation is often insufficient." (FGD1/N2)
	Policy & workload constraints	Documentation, time, institutional support	"The time and documentation limitations faced by pharmacists represent major obstacles to effective interprofessional communication." (FGD2/P7)

Appendix 3. Audit Trail and Trustworthiness Strategies

To enhance rigor and transparency, the research team applied additional strategies in line with COREQ standards:

1. Credibility

- a. *No participant dropout*: All invited professionals consented to join and remained engaged throughout the FGDs; no participant withdrew during the study.
- b. *Member-checking*: This is done in two ways: (1) real-time checking during the FGD, where a summary of responses is read back for verification, and (2) post-session validation through the distribution of the initial analysis summary to selected participants. During and after each FGD, participants were invited to review summaries of their contributions. Clarifications and minor corrections were incorporated into the transcripts to ensure the accuracy of interpretations.
- c. *Triangulation*: Perspectives were obtained from pharmacists, doctors, nurses, and psychologists across diverse practice settings.

2. Dependability

- a. *Audit trail*: Detailed documentation of the research process was maintained, including raw transcripts, coding memos, iterative theme development, and decision logs.
- b. *Peer debriefing*: Regular team meetings were held to refine coding and resolve discrepancies.
- c. *Code-recode*: Two researchers independently coded and re-coded the transcripts at different times to test consistency.

3. Transferability

- a. *Thick description*: The context of South Kalimantan (urban–rural characteristics, service infrastructure) was described to allow assessment of transferability to other LMIC contexts.
- b. *Maximum variation sampling*: Inclusion of participants from hospital, primary care, and community services ensured a wide range of perspectives.

4. Confirmability

- a. *Reflexivity*: Gender and professional backgrounds of the researchers (majority pharmacists, female lead interviewer) were acknowledged, and reflexive notes were used to minimize bias during data collection and interpretation.
- b. *External audit*: The coding framework (Appendix 2) was reviewed by independent senior qualitative researchers.
- c. *Data–quote linkage*: Verbatim quotations were presented alongside themes to support interpretation transparently.

Appendix 4. Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Table A4.1 Narrative Summary of COREQ Checklist

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
<i>Personal Characteristics</i>		
1. Inter viewer/facilitator	Which author/s conducted the interview or focus group?	Page 2 "Methods – Data Collection"
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 2-3 "Methods – Data Analysis"
3. Occupation	What was their occupation at the time of the study?	Page 2-3 "Methods – Data Analysis"
4. Gender	Was the researcher male or female?	Page 19 "Appendix 3 – Reflexivity"
5. Experience and training	What experience or training did the researcher have?	Page 2 "Methods – Data Analysis"
<i>Relationship with participants</i>		
6. Relationship established	Was a relationship established prior to study commencement?	"Appendix 3 – Reflexivity"
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Page 2 "Methods – Data Collection"
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	"Appendix 3 – Reflexivity"
Domain 2: study design		
<i>Theoretical framework</i>		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Page 2 "Methods – Data Analysis"
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Page 1-2 "Methods – Participants and Sampling"
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 2 "Methods – Participants and Sampling"
12. Sample size	How many participants were in the study?	Page 2 "Results – Participant characteristics"
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Page 22 "Appendix 3 – Credibility"
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 2 "Methods – Setting"

15. Presence of non-participants	Was anyone else present besides the participants and researchers?	"Appendix 3 – Credibility"
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 3 "Results"; Table 1 & 2
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	"Appendix 1"
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	No re-interview was conducted
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 2 "Methods – Data Collection"
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Page 2 "Methods – Data Collection"
21. Duration	What was the duration of the interviews or focus group?	Page 2 "Methods – Data Collection"
22. Data saturation	Was data saturation discussed?	Page 2 "Methods – Data Collection"
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Page 2 "Methods – Data Collection; Appendix 3"
Domain 3: analysis and findings		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	Page 2-3 "Methods – Data Analysis"
25. Description of the coding tree	Did authors provide a description of the coding tree?	Page 18-21 "Appendix 2"
26. Derivation of themes	Were themes identified in advance or derived from the data?	Page 2-3 "Methods – Data Analysis"
27. Software	What software, if applicable, was used to manage the data?	Page 3 "Methods – Data Analysis"
28. Participant checking	Did participants provide feedback on the findings?	"Appendix 3 – Credibility"
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Page 4-6 "Results"; Table 3 & 4"
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Page 4-6 "Results – Thematic Findings"
31. Clarity of major themes	Were major themes clearly presented in the findings?	Page 4-6 "Results – Thematic Findings"
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Page 4-6 "Results – Subthemes (family, stigma, culture)"

This study was reported in accordance with the **Consolidated Criteria for Reporting Qualitative Research (COREQ) 32-item checklist**. Table A4.1 summarizes how each criterion was addressed in the manuscript, including the section and page numbers where relevant information can be found.

The majority of COREQ items (31/32) were fulfilled. Information regarding the research team (credentials, occupation, gender,



reflexivity), sampling (purposive and snowball strategy), study setting, participant characteristics, data collection, and analysis were explicitly described in the *Methods* and *Results* sections, and supported by appendices (Appendix 1–3). Key strategies to enhance trustworthiness, including member-checking, triangulation, audit trail, and reflexive journaling, were documented in Appendix 3.

Only one item (repeat interviews) was not conducted due to participants' limited availability. This limitation was mitigated by achieving data saturation during FGDs, applying member-checking during and after sessions, and triangulating perspectives across professional groups. Therefore, the absence of repeat interviews did not compromise the credibility or depth of findings.

Overall, adherence to COREQ standards ensures that the study's methodology, analysis, and interpretation are transparent, rigorous, and transferable, thereby strengthening confidence in the validity of the findings.