Social Stigma, Family Support, and Healthcare Access as Determinants of Substance Use Among Transgender Populations: A Quantitative Study in South Sulawesi, Indonesia

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DOI: 10.24252/al-sihah.v17i1.55863
Received: 3 March 2025 / In Reviewed: 16 May 2025 / Accepted: 26 June 2025 / Available online: 28 June 2025

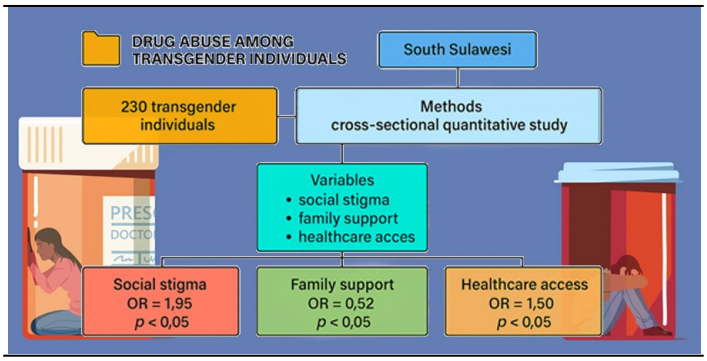
ABSTRACT

Substance abuse among transgender individuals remains underexplored, particularly in the context of how intersecting social determinants contribute to its prevalence. Existing studies often overlook the paradox wherein increased healthcare access does not equate to effective support due to systemic bias and exclusion in service provision. This study aims to analyze the influence of social stigma, family support, and healthcare access on drug abuse among transgender individuals in South Sulawesi. A cross-sectional quantitative study was conducted involving 230 transgender individuals in South Sulawesi, including 178 residing in Makassar. Data were collected through structured interviews and validated questionnaires, and then analyzed using descriptive statistics and logistic regression. The findings indicate that social stigma is a significant risk factor linked to an increased likelihood of substance use ($p < 0.05$), whereas family support shows a protective association, potentially mitigating the risk of substance use within this population. However, greater access to healthcare services is associated with higher chances of substance use, indicating challenges in the effectiveness of rehabilitation services for transgender individuals, particularly due to persistent stigma, lack of provider training in gender-sensitive care, and limited inclusivity within existing healthcare systems.These findings highlight the need for a holistic intervention framework that prioritizes stigma reduction, social support, and inclusive healthcare access, particularly within marginalized and rural health systems. The evidence may guide policies aimed at enhancing equity and responsiveness in service delivery for underserved populations.

ABSTRAK

Penyalahgunaan narkoba di kalangan individu transgender masih kurang mendapat perhatian dalam penelitian, terutama terkait bagaimana faktor-faktor sosial yang saling berinteraksi berkontribusi terhadap perilaku tersebut. Penelitian sebelumnya sering mengabaikan paradoks bahwa meningkatnya akses layanan kesehatan tidak selalu berarti dukungan yang efektif, karena masih adanya bias sistemik dan pengecualian dalam pemberian layanan. Penelitian ini bertujuan untuk menganalisis pengaruh stigma sosial, dukungan keluarga, dan akses layanan kesehatan terhadap penyalahgunaan narkoba pada individu transgender di Sulawesi Selatan. Studi kuantitatif dengan desain potong lintang ini melibatkan 230 individu transgender, termasuk 178 yang berdomisili di Makassar. Data dikumpulkan melalui wawancara terstruktur dan kuesioner tervalidasi, kemudian dianalisis menggunakan statistik deskriptif dan regresi logistik. Hasil menunjukkan bahwa stigma sosial merupakan faktor risiko signifikan yang berkaitan dengan meningkatnya peluang penyalahgunaan narkoba ($p<0,05$). Sebaliknya, dukungan keluarga menunjukkan efek protektif, yang dapat menurunkan risiko penggunaan narkoba dalam kelompok ini. Menariknya, akses layanan kesehatan yang lebih luas justru berhubungan dengan kemungkinan penyalahgunaan narkoba yang lebih tinggi. Hal ini mengindikasikan masih adanya tantangan dalam efektivitas layanan rehabilitasi, seperti stigma yang terus ada, kurangnya pelatihan petugas dalam layanan yang peka gender, serta minimnya inklusivitas dalam sistem layanan yang tersedia. Temuan ini menekankan pentingnya pengembangan kerangka intervensi yang menyeluruh, dengan fokus pada pengurangan stigma, penguatan dukungan sosial, dan penyediaan layanan kesehatan yang inklusif, khususnya di sistem kesehatan yang terpinggirkan dan wilayah pedesaan. Bukti ini dapat menjadi masukan penting bagi perumusan kebijakan yang mendorong kesetaraan dan peningkatan kualitas layanan bagi kelompok yang kurang terlayani.

GRAPHICAL ABSTRACT



Keyword
family support
health services
substance abuse
social stigma
transgender people

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ISSN-P : 2086-2040
ISSN-E : 2548-5334

INTRODUCTION

Substance abuse among transgender individuals poses a significant public health challenge and undermines the achievement of global and national development goals, particularly the Sustainable Development Goals (SDGs), such as SDG 3 (Good Health and Well-Being) and SDG 10 (Reduced Inequalities). The World Health Organization (WHO) emphasizes the need for inclusive and equitable healthcare access, especially for vulnerable and marginalized populations, including transgender communities. At the national level, Indonesia has initiated various programs to address substance abuse and promote health equity; however, specific attention to the needs of transgender individuals remains limited. Globally, transgender individuals are disproportionately affected by substance use due to overlapping structural vulnerabilities, including discrimination, stigma, and marginalization (Scheim et al., 2024).

Studies have demonstrated that transgender individuals face a higher prevalence of substance use disorders compared to the general population, largely driven by minority stress, inadequate access to social support, and systemic exclusion from health services (Burnett et al., 2025; Freitas et al., 2024; Göksel, 2024). In the Indonesian context, both social and institutional stigma and discrimination further exacerbate these risks and often compel transgender individuals to use substances as a coping mechanism (Fahey et al., 2023). Social stigmatization may lead to isolation and reduced willingness to seek help, while discriminatory experiences within health facilities often result in inadequate, insensitive care that undermines rehabilitation efforts (Levine et al., 2022; Paschen-Wolff et al., 2024). In contrast, literature underscores the importance of family and community support as protective factors that enhance psychological resilience and facilitate recovery (Nawi et al., 2021).

Substance abuse among transgender individuals is a complex issue that significantly impacts both individual and public health (Burnett et al., 2025; Freitas et al., 2024). Transgender individuals often face discrimination, social stigma, and marginalization, which increase their susceptibility to substance use as a coping mechanism for social pressures (Göksel, 2024). Studies indicate that transgender populations are at elevated risk for substance use disorders compared to the general population, largely due to minority stress and limited availability of appropriate social support (Laughney et al., 2025; Johnson et al., 2025).

Social stigmatization of transgender individuals who use substances can exacerbate their vulnerability by increasing social isolation and reducing their willingness to pursue rehabilitation services (Meyers et al., 2021). In addition, discrimination within health care systems often hinders their access to appropriate treatment (Paschen-Wolff et al., 2024). Studies demonstrate that many transgender individuals experience exclusion or non-inclusive services, which ultimately impedes their recovery (Levine et al., 2022). In contrast, family and community support serve as protective factors that help individuals cope with social pressures and reduce the risk of substance abuse (Nawi et al., 2021). This support can enhance psychological resilience and provide access to improved resources for rehabilitation.

Although various studies have investigated determinants of substance use (Arrington-Sanders et al., 2022; Hajek et al., 2023; Kelly et al., 2024; Kidd et al., 2023; Wolfe et al., 2021), there is a gap in understanding the interaction between social stigma, family support, and healthcare access in the context of transgender populations in Indonesia. Most studies isolate individual determinants, while comprehensive approaches that integrate all three aspects are limited. A deeper understanding of how these variables interrelate can support the design of more effective and inclusive interventions for transgender individuals affected by substance use.

To address this gap, it is essential to adopt an integrative, context-sensitive approach

that captures the complexity of social determinants influencing substance use. Despite the growing body of research on substance use, most existing studies address isolated individual factors and lack an integrative perspective that examines the interaction of social stigma, family support, and healthcare access. In addition, research in the Indonesian context is scarce, particularly in relation to transgender populations. Therefore, this study aims to analyze the influence of various social determinants, such as stigma, mental health status, family support, economic conditions, peer networks, healthcare access, traumatic experiences, engagement in sex work, and educational attainment, on substance use patterns among transgender individuals in South Sulawesi. Through this multidimensional approach, the study seeks to generate empirical evidence that can inform inclusive public health policies and support the development of targeted interventions addressing the needs of marginalized populations in Indonesia.

METHODS

This study employed a quantitative survey design to examine the relationships between social stigma, family support, access to health services, and substance use behavior among transgender individuals in South Sulawesi. This approach was selected to generate a systematic and measurable understanding of the factors influencing substance use in this population.

Participants

A total of 230 transgender individuals residing in South Sulawesi participated in this study. The majority (n = 178; 77.4%) were from the provincial capital, Makassar, while the remainder were distributed across various other regions within the province. Inclusion criteria comprised transgender individuals aged 18 years or older who had either a history of substance use or were identified as being at high risk of substance use. Participants were purposively selected based on their engagement with the transgender community and their informed willingness to participate.

Data Collection

Data collection involved structured interviews and standardized questionnaires. The structured interviews aimed to explore participants' experiences of social stigma, family support, and access to health services in relation to substance use. The questionnaires were used to quantitatively assess the primary study variables, utilizing instruments adapted from previously validated sources. Substance use (Yes/No) was assessed using selected items from the Drug Use Disorders Identification Test (DUDIT) developed by Berman et al. (2005), which evaluates patterns of use and related behavioral problems. Social stigma (Yes/No) was measured using a simplified version of the Gender Minority Stress and Resilience Measure (Testa et al., 2015), which captures experiences of enacted and anticipated stigma among transgender individuals. Mental health problems (Yes/No) were assessed through items reflecting psychological distress, adapted from the General Health Questionnaire.

Family support (Yes/No) was evaluated using core items from the Perceived Social Support—Family scale (Procidano & Heller), which measures perceived emotional and practical support from family members. Economic condition (Poor/Sufficient) was assessed via participants' self-evaluation of their financial status, following methodologies used in studies of subjective socioeconomic status (Adler et al., 2000). Peer social environment (Sufficient/Insufficient) was measured by adapting items from peer-risk environment instruments frequently used in substance use research (Rhodes et al., 2005). Access to health services (Sufficient/Insufficient) was evaluated using adapted items from the Barriers to Care Scale (Ortiz et al., 2004), focusing on availability, acceptability, and inclusivity of healthcare and rehabilitation services. Traumatic experiences (Yes/No) were assessed using screening

items from the Life Events Checklist developed by the National Center for PTSD. Involvement in sex work (Yes/No) was measured through a direct behavioral question, as commonly employed in studies involving high-risk populations. Education level (Low/High) was categorized based on the highest level of formal education completed by participants, in accordance with national classification standards.

All instruments used in this study demonstrated acceptable validity and reliability in previous research and were reviewed for cultural and contextual appropriateness within the Indonesian setting. The collected data were analyzed to explore the relationships among these variables and to understand how intersecting social and structural determinants shape substance use patterns among transgender individuals in South Sulawesi.

Data Analysis

These collected data were then examined using descriptive, as well as inferential, statistical methods. Descriptive analyses were used to present the characteristics of the participants, as well as the distribution of study variables, such as levels of social stigma, family support, healthcare access, and prevalence of substance use among transgender individuals. This method is in line with standard practices in social research that aim to capture the demographic and behavioral profiles of a specific population.

To assess the impact of the independent variables—social stigma, family support, and healthcare access—on the likelihood of substance use, logistic regression modelling was employed. Logistic regression enables investigators to examine the relationship between several predictor variables and a binary outcome variable, such as substance use (yes/no), and is widely applied in epidemiology and public health research. For example, the study conducted by Najafi-Ghobadi et al. (2019) utilized logistic regression to determine factors influencing the transition from substance use to injection drug use. This method helped reveal factors that significantly affected substance use behavior among transgender individuals.

All analytical procedures were carried out using reliable statistical software tools, such as SPSS or R, to ensure statistical accuracy and result reliability throughout the study. The application of such tools is crucial in quantitative analysis to reduce errors and enhance the credibility of the results.

This methodological strategy is intended to offer a deeper understanding into the complex variables contributing to substance use among transgender people in South Sulawesi. Such insight provides a necessary basis for the development of more impactful and contextually responsive policies and intervention strategies that are adapted to the social conditions and specific needs of the transgender population.

Ethical clearance for this study was obtained from the Health Research Ethics Committee of the Faculty of Health, University Pejuang Republik Indonesia (approval number: 0147/Etik/Fakes/UPRI/VIII/2024). All respondents were fully briefed about the study aims and methods, and provided written informed consent prior to joining the study. The study was conducted in accordance with established ethical protocols, ensuring voluntary involvement, anonymity, and strict data confidentiality throughout all stages of the research process.

RESULTS

Table 1 displays the frequency distribution of key categorical variables related to substance use among transgender participants in South Sulawesi. The results show that drug abuse occurred almost equally among respondents, with 50.4% reporting no drug use and 49.6% reporting substance use. Stigma was also reported almost equally, with 50.4% of respondents reporting experiences of stigma and 49.6% not experiencing stigma. Mental health status showed similar results, with 49.6% of respondents reporting mental health issues, and 50.4% not experiencing them. Family support was also almost equal, with 50.4% of respondents lack-

Table 1
Descriptive statistics of the variables

Variable	Amount	%	CI 95%		p value
			Lower	Upper	
Drug Abuse					
No	68	50.4	0.416	0.591	1.000
Yes	67	49.6	0.409	0.584	
Stigma					
Yes	68	50.4	0.416	0.591	1.000
No	67	49.6	0.409	0.584	
Mental Health Problems					
Yes	67	49.6	0.409	0.584	1.000
No	68	50.4	0.416	0.591	
Family Support					
Yes	68	50.4	0.416	0.591	1.000
No	67	49.6	0.409	0.584	
Economic Condition					
Poor	73	54.1	0.453	0.627	0.390
Sufficient	62	45.9	0.373	0.547	
Social Environment with Drug Users					
Insufficient	62	45.9	0.373	0.547	0.390
Sufficient	73	54.1	0.453	0.627	
Access to Health Services					
Insufficient	66	48.9	0.402	0.576	0.863
Sufficient	69	51.1	0.424	0.598	
Traumatic Experience					
Yes	72	53.3	0.446	0.62	0.491
No	63	46.7	0.38	0.554	
Involvement in Prostitution					
Yes	69	51.1	0.424	0.598	0.863
No	66	48.9	0.402	0.576	
Education Level					
Low	73	54.1	0.453	0.627	0.390
Hight	62	45.9	0.373	0.547	

Note: 95% confidence intervals (CIs), p values are included to indicate differences in proportions between categories within each variable .

ing family support, while 49.6% indicated receiving family support. On the variable of economic condition, 54.1% of respondents reported poor economic conditions, while 45.9% reported sufficient economic conditions. Similarly, the social environment influenced by drug users showed that 54.1% of respondents were in a neighborhood with moderate exposure to drug users, while 45.9% reported lesser influence. Access to health services was relatively evenly distributed, with 48.9% of respondents reporting limited access and 51.1% reporting sufficient access. Traumatic experiences also showed an almost equal distribution, with 53.3% of respondents reporting traumatic experiences and 46.7% reporting none. The level of involvement in sex work was reported by 48.9% of respondents, while 51.1% were not involved. Lastly, the educational attainment showed that 54.1% of respondents had a lower level of education, while 45.9% had a higher level of education.

The results of the logistic regression analysis in Table 2 show that several factors have significant relationships with substance use. Stigma has a significant positive effect on substance use, where individuals who experience stigma are 963.68 times more likely to use substances than those who do not experience stigma ($\beta = 6.87$, $p = 0.033$, OR = 963.68). In contrast, family support showed a significant protective effect, with individuals who had family support showing lower odds of substance use ($\beta = -7.25$, $p = 0.031$, OR = 0.0007).

Table 2
Results of logistic regression analysis

Predictor	Estimate	P-Value	OR
Intercept	-8.29	0.053	2.51E-04
Stigma			
Yes - No	6.87	0.033	963.6849
Mental Health Problems			
Yes - No	-3.36	0.091	0.0348
Family Support			
Yes - No	-7.25	0.031	7.12E-04
Economic Condition			
Sufficient - Poor	-1.51	0.353	0.2214
Social Environment of Drug Users			
Sufficient - Insufficient	1.7	0.503	5.4964
Access to Health Services			
Sufficient - Insufficient	10.74	0.04	45956.151
Traumatic Experience			
Yes - No	4.62	0.078	101.9117
Involvement in Prostitution			
Yes - No	4.04	0.035	57.0496
Level of education			
High - Low	5.35	0.025	210.2124

Note: Significant predictors ($p < 0.05$) include: stigma, family support, access to health services, involvement in prostitution, and level of education. p = p-value indicating statistical significance; OR = Odds Ratio showing the likelihood of drug abuse occurrence relative to the reference category

In addition, access to health services had a significant positive association, with individuals with better access being 45,956.15 times more likely to use substances than those with limited access ($\beta = 10.74$, $p = 0.04$, OR = 45,956.15). Several other factors also showed significant associations with substance use. Involvement in sex work has a positive correlation with substance use, with individuals involved in sex work having a 57.05 times greater chance of using substances than those not involved ($\beta = 4.04$, $p = 0.035$, OR = 57.05). In addition, a higher education level significantly increased the odds of substance use ($\beta = 5.35$, $p = 0.025$, OR = 210.21), suggesting that individuals with higher education are at greater risk than those with lower levels.

Meanwhile, some other variables did not show a significant relationship with substance use. Mental health issues had a negative but insignificant relationship with substance use ($\beta = -3.36$, $p = 0.091$, OR = 0.0348), as did economic conditions ($\beta = -1.51$, $p = 0.353$, OR = 0.2214) and the social environment with drug users ($\beta = 1.7$, $p = 0.503$, OR = 5.4964). Traumatic experiences showed a positive tendency toward substance use ($\beta = 4.62$, $p = 0.078$, OR = 101.91), but this relationship was not statistically significant. These results indicate that social factors, such as stigma, family support, and involvement in sex work, play an important role in influencing substance use, while certain economic and social environmental factors have a more limited impact. abuse, while certain economic and social environmental factors have a more limited impact

DISCUSSION

The findings of this study identified several factors that were significantly correlated with substance use, with stigma toward individuals who use substances emerging as a prominent risk factor. Individuals who experienced stigma were more likely to be involved in substance use, which aligns with previous research showing that community stigma can exacerbate the condition of substance users, obstruct recovery, and heighten the risk of relapse (Bailey et al., 2024; Decila Putri, 2021). Stigmatization often leads to social isolation and diminished self-esteem, which can increase susceptibility to recurring substance use as a coping mecha-

nism (Earnshaw, 2020; Wang et al., 2018).

In the context of South Sulawesi, especially in rural areas, the negative impact of stigma is intensified by systemic limitations in the local health infrastructure. These include a shortage of mental health services, the absence of culturally competent healthcare providers, and limited access to inclusive, gender-sensitive care. Such conditions contribute to both perceived and actual barriers to healthcare, where services may be available in principle but are not experienced as accessible or supportive by transgender individuals. Factors such as systemic discrimination, inadequate gender sensitivity, and poor service quality further reduce service uptake. In the absence of effective formal support mechanisms, many individuals turn to informal networks—such as peers or community leaders—that often lack the resources and expertise to facilitate recovery, thereby increasing their vulnerability to substance dependence.

In contrast, family support demonstrates significant protective effects against substance use. Individuals who reported receiving family support had a lower likelihood of participating in substance use. This is consistent with the theory that social support, particularly from family, plays an important role in the recovery process and relapse prevention among substance users (Das et al., 2024; Sun et al., 2024; Xia et al., 2022). Family support can increase an individual's motivation to recover and provide the emotional and instrumental resources required during the rehabilitation process (Hogue et al., 2021). The findings of this study indicate that better access to health services was positively associated with the chances of substance use. This finding may reflect that access to health services does not necessarily mean increased utilization of rehabilitation services, but could also result in higher detection rates of substance use cases. This is in line with previous findings, which showed that although health services are available, only about 10% of individuals with substance use disorders actually utilize them for rehabilitation (Choi et al., 2023). In addition, Horan et al. (2024) pointed out that demographic and social factors can influence how individuals utilize health services, so increased access does not necessarily guarantee a decrease in substance use.

The analysis also indicates that some variables such as mental health conditions, economic status, and exposure to drug-using social environments do not have a significant relationship with substance use. This lack of significance may be due to individual variability as well as contextual factors that influence substance use behavior patterns. For example, while many studies have linked mental illness with an increased risk of substance use (Chiu et al., 2018; Iqbal et al., 2019), others have shown that not all individuals with mental illness develop substance dependence. Factors such as social support, coping strategies, and the severity of the mental disorder may be moderating variables that influence this relationship (Su et al., 2022). Therefore, although the relationship between mental health and substance use is often reported in the literature, in some contexts this relationship can be more complex and influenced by other factors not captured in this study.

The findings of this study demonstrate that certain variables, such as mental health problems, economic conditions, and social exposure to drug-using social environments, did not show statistically significant associations with substance use among transgender individuals. This lack of significance may be attributed to individual variability and unmeasured contextual factors that shape substance use behavior. Although previous research has consistently identified mental illness as a risk factor for substance dependence (Chiu et al., 2018; Iqbal et al., 2019), it is important to recognize that not all individuals with mental disorders progress to substance dependence. The relationship between mental health and substance use is likely influenced by other variables, such

as the availability of social support, use of adaptive versus maladaptive coping strategies, and the severity or type of mental illness (Su et al., 2022). In this context, the lack of significant associations may reflect the influence of these unmeasured moderating factors. Similarly, economic hardship and being in a high-risk social environment may only lead to substance use under certain psychosocial conditions, such as prolonged stress, lack of family support, or peer pressure. Therefore, although these variables are theoretically and empirically relevant, their impacts may not emerge uniformly across all populations and environments, especially in marginalized groups such as transgender individuals in South Sulawesi.

In addition, economic conditions did not demonstrate a significant relationship with substance use in this study. This finding is in contrast to some studies that suggest individuals with low economic status are more vulnerable to substance use due to financial stress and limited access to quality health services (Edwards et al., 2020). However, other studies have found that economic factors are not the only predictors of substance use; variables such as the social environment and family support also play an important role (Weybright et al., 2016). Thus, in the context of this study, it is likely that other social factors are more dominant in influencing substance use behavior than economic factors alone. Similarly, the presence of substance use in one's social network did not show a significant relationship in this study. In fact, many previous studies have shown that peer influence is one of the main factors contributing to substance use, especially among adolescents and young adults. One possible explanation for the results obtained is that individuals who have a social environment with drug users may have other protective factors, such as high risk awareness or self-control, and thus do not necessarily engage in substance use.

Overall, the results of this study highlight the necessity of adopting a holistic and multidimensional approach to addressing substance use among transgender individuals. Such an approach should encompass not only individual and behavioral aspects but also social, familial, and structural determinants, including stigma, family support, and access to inclusive and culturally competent health services. The study demonstrates that the relationship between various risk factors and substance use behaviors is neither linear nor uniform; rather, it is shaped by complex interactions between psychosocial dynamics and broader structural conditions.

A notable strength of this study lies in its focus on a marginalized and underresearched population within a specific regional context, offering valuable empirical insights into local patterns and determinants of substance use. The application of validated instruments and logistic regression analysis further enhances the reliability and robustness of the findings. Nevertheless, several limitations should be acknowledged. The cross-sectional design limits the ability to draw causal inferences. Additionally, potentially influential variables—such as individual coping strategies, the role of broader community support systems, and the type or severity of co-occurring mental health conditions—were not assessed. The reliance on self-reported data also introduces the potential for recall and social desirability biases. Despite these limitations, the study provides critical evidence to inform the development of inclusive, context-sensitive intervention strategies that are tailored to the unique needs of vulnerable transgender populations.

CONCLUSIONS

The findings of this study underscore the complexity of factors influencing substance use. Stigma towards individuals who use substances was found to be a significant risk factor, while family support acted as a protective mechanism in preventing substance use. However, a surprising finding was that better access to health services was positively associated with increased substance use, which could be ex-

plained by factors such as higher case detection or the lack of effectiveness of available rehabilitation services. The study's findings emphasize the complex interplay of factors influencing substance use among transgender individuals. Stigma was identified as a major risk factor, while family support functioned as a protective factor. Interestingly, better access to health services correlated with higher substance use rates—likely due to increased case detection or shortcomings in the effectiveness and inclusivity of current rehabilitation programs. This underscores the limitations of generalized interventions and the need for context-specific, multidimensional strategies. Additionally, variables such as mental health issues, economic status, and peer exposure showed no significant associations, suggesting their influence may differ across social contexts. These findings offer critical insights for enhancing public health policies in Indonesia and other low- and middle-income countries (LMICs) by emphasizing the integration of stigma-reduction efforts, family-centered support, and culturally responsive healthcare within substance use prevention and treatment strategies. A holistic and contextually grounded approach is essential for effective intervention and rehabilitation planning.

Future research is encouraged to utilize longitudinal designs to better understand causal relationships between variables. Further exploration of moderating factors, such as coping strategies, social support, and mental health severity, is also needed. Incorporating qualitative approaches and expanding geographic scope may help capture broader contextual dynamics. Additionally, evaluating inclusive and culturally sensitive rehabilitation models can inform more targeted and effective policy development, particularly in LMICs.

ACKNOWLEDGEMENT
Thank you to Mitra Husada Foundation of South Sulawesi for helping and facilitating the author during this research.

FUNDING
The authors received no specific funding for this study.

AUTHORS' CONTRIBUTIONS
Muhammad Azwar designed the study, formulated the concept, enrolled participants, reviewed the manuscript, performed the field work. Lilis Widiastuty collected data and performed the field work. Wirawan S. Laksana enrolled participants and analyzed the data. All auhtors wrote the manuscript and approved the final manuscript

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COMPETING INTERESTS
The authors confirm that all of the text, figures, and tables in the submitted manuscript work are original work created by the authors and that there are no competing professional, financial, or personal interests from other parties.

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