

Community-Based Digital Interventions to Combat Drug Abuse in Rural Areas: A Pilot Study in Central Java

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ABSTRACT

Illegal drug addiction remains a significant public health issue in rural areas, which has limited access to prevention and treatment services. This current research examines the possible of community-level digital interventions as a solution for rural drug abuse issues in rural Central Java. Using a qualitative design, the data were collected from in-depth interviews with six key informants like community leaders, health professionals, a digital literacy expert, and a former drug user. Thematic analysis identified that although digital interventions like online counseling, social media campaigns, and mobile apps have the potential for contribution, their success is hindered by low digital literacy, restricted internet access, cultural stigma, and lack of trust in digital platforms. The results underscore the need for community involvement, hybrid intervention models (blending online and offline) and localized content production to improve digital drug prevention efforts. The study concludes that for digital interventions to be effective in rural communities, they must be developed based on local socio-cultural contexts and integrated with existing community support systems.

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1. INTRODUCTION

Drug abuse is a chronic public health problem that affects communities worldwide, including rural communities where prevention and treatment services are generally in short supply. Indonesian rural communities are not different, with rural communities facing particular challenges in confronting drug abuse, such as an

inadequate healthcare infrastructure, stigma, and low awareness of support systems in place [1], [2]. The National Narcotics Agency (BNN) has identified rural communities as target areas, demanding innovative, community-oriented solutions with a sense of urgency.

The advancement of digital technology offers new hope to address drug abuse in a more digitally inclined manner in

intervention within and beyond the health facilities. Mobile phone applications, social media, and online counseling are potential areas to engage at that will most likely close information gaps and make services accessible even beyond outposts of facilities [3], [4]. Empirical research supports digital interventions could help healthcare providers and the patients/substance users to engage positively on communications about addressing and living without such harmful products [5], [6]. Nevertheless, the efficacy of these interventions in rural areas is under-researched, especially in Indonesia.

This pilot study aims to study the use and impact of digital interventions against drug abuse at the community level in rural Central Java. This study employs a qualitative design in studying the perceptions of six key informants among the community leaders, medical personnel, and victims of drug abuse. The purpose of this study is to evaluate how digital interventions are perceived, the challenges encountered in their use, and to what extent they enhance prevention and rehabilitation from drug abuse.

Drug abuse is a growing issue in Indonesia, and rural communities are at greater risk due to restricted access to prevention activities, medical services, and law enforcement efforts. The National Narcotics Agency (BNN) indicates that drug cases in rural communities have been on the rise, driven by social isolation, economic poverty, and a low level of public awareness. Central Java, a province with a high percentage of the population residing in rural areas, witnessed a dramatic increase in the abuse of drugs among young people, threatening public health and social stability. The urgency to solve the issue is heightened by the rapid evolution of drug trafficking methods, which utilize internet resources to reach potential consumers. Unless successful interventions are carried out, rural drug abuse can continue to increase, yielding long-term social and public health outcomes.

The traditional anti-drug activities such as one-on-one counseling and advertising campaigns have not reached the

rural populations because of logistical and geographic difficulties. Besides, the drug consumption stigma causes individuals to be afraid of getting help, and therefore most are left untreated and vulnerable to drug addiction. Though digital technology has transformed urban healthcare services, its use in rural drug prevention remains unexplored. Research on how community-based digital interventions such as online counseling, educational campaigns, and peer-support networks can be effectively utilized to prevent drug abuse among rural communities is urgently needed. Without an effective implementation strategy, these digital interventions stand to be underused or ineffective in dealing with the underlying causes of drug abuse.

Objective

This research proposes to investigate the efficacy of digital interventions based in communities in tackling drug abuse in rural Central Java. In particular, it wants to:

1. Study the ways digital platforms are currently being utilized in drug abuse prevention and rehabilitation at the rural community level.
2. Understand the limitations and challenges involved in rolling out digital interventions.
3. Identify the perceptions of key stakeholders like community leaders, health workers, and victims of drug abuse towards the application of digital methods of drug prevention.
4. Provide recommendations on how to improve the adoption and impact of digital interventions in rural anti-drug campaigns.

2. LITERATURE REVIEW

2.1 Drug Abuse in Rural Areas

Drug abuse remains a serious global issue, with particularly severe impacts in rural areas due to limited healthcare access,

weak law enforcement, economic hardship, and strong social stigma. In Indonesia, rising drug abuse in rural communities is linked to poverty, low awareness, and minimal rehabilitation support [7]. Economic instability often drives individuals to substance use, while drug traffickers exploit poor enforcement and digital illiteracy [6], [8], making conventional intervention programs less effective in these settings.

2.2 The Role of Community-Based Interventions

Community-based interventions have proven effective in tackling drug abuse by utilizing local resources, cultural values, and community networks to create solutions tailored to local needs [4]. Such approaches promote sustainability through community participation, which fosters ownership and shared responsibility [1]. Successful examples include Thailand's "Village Against Drugs" program, which combined grassroots education and community surveillance, and Brazil's peer counseling initiatives that aided rehabilitation and social reintegration of drug users [3], demonstrating the power of local engagement in addressing substance abuse.

2.3 Digital Interventions for Drug Prevention and Rehabilitation

The rapid advancement of digital technology offers new opportunities to address drug abuse through interventions like online education, telehealth counseling, and mobile apps, which have shown success in

urban settings [9], though their use in rural areas remains limited. Digital tools such as educational apps, relapse prevention resources, peer support platforms, and social media campaigns have improved engagement and reduced stigma among at-risk individuals [10], [11]. However, challenges like poor internet access, digital illiteracy, cultural resistance, and concerns over data privacy and the reliability of online services continue to hinder their effectiveness in rural communities.

2.4 Challenges and Opportunities in Implementing Digital Interventions in Rural Indonesia

Indonesia presents a unique context for digital drug prevention due to its large rural population and increasing internet penetration, though significant digital divides remain, with many lacking access to smartphones, stable internet, or digital literacy (Kominfo, 2022). Despite these challenges, initiatives like the government's "Desa Digital" program aim to integrate technology into rural communities for healthcare and education (Kemendes PDTT, 2022). Collaborations among NGOs, academic institutions, and local governments also offer promising opportunities to bridge the gap through digital training and expanded access to online rehabilitation services.

2.5 Conceptual Framework

This study adopts the Community-Based Participatory Research (CBPR) framework, which promotes collaboration between researchers and community members to develop

contextually relevant and culturally sensitive solutions [12], [13], making it well-suited for co-developing digital drug prevention tools with local stakeholders. Additionally, the Technology Acceptance Model (TAM) is used to understand the adoption of these digital interventions in rural areas, emphasizing that perceived usefulness and ease of use influence individuals' willingness to embrace new technology [14]. Through TAM, the study explores how rural communities in Central Java perceive digital interventions and identifies factors that support or hinder their adoption.

3. METHODS

This study employs a qualitative research design to explore the implementation and effectiveness of community-based digital interventions in combating drug abuse in rural Central Java. A qualitative approach is appropriate for capturing the perceptions, experiences, and challenges of stakeholders involved in adopting digital tools for drug prevention and rehabilitation [15]. Using a case study method, the research focuses on a rural area in Central Java known for its active anti-drug initiatives and recent efforts to incorporate digital health interventions. Six key informants were purposively selected to represent diverse perspectives: two community leaders, two healthcare professionals, one digital literacy expert, and one former drug user. Data were collected through semi-structured interviews lasting 30–60 minutes and observations of how digital tools—such as mobile apps, social media campaigns, and online counseling—were utilized in the community. All interviews were audio-recorded with consent, transcribed, and treated with strict confidentiality.

Thematic analysis, following Braun and Clarke's (2006) six-step framework, was used to analyze the data. The process involved familiarizing with the data, generating codes, identifying and refining themes, and producing a report that synthesizes the key findings. Themes such as digital accessibility, intervention effectiveness, and community engagement emerged from the analysis. To ensure credibility, member checking was conducted by sharing the findings with participants for validation. This approach allowed the study to provide in-depth insights into the successes and limitations of digital interventions in rural drug prevention, highlighting both the potential and the barriers that must be addressed for sustainable implementation.

4. RESULTS AND DISCUSSION

4.1 Accessibility and Utilization of Digital Interventions

The study found that digital interventions for drug abuse prevention in rural Central Java are still in their early stages. While community members have access to mobile phones and the internet, usage remains limited due to low digital literacy. Interviewed healthcare professionals noted that only a small percentage of drug users or at-risk individuals actively seek help through digital platforms, as many are unaware of available resources. One community leader stated:

"Many people in our village own smartphones, but they mostly use them for social media and entertainment. Very few know about digital counseling or online rehabilitation programs." Observations showed that while government and non-profit organizations have introduced social media campaigns and mobile applications for drug awareness, these tools are not widely used due to a lack of localized content and community engagement strategies.

These findings align with previous research indicating that rural communities often face barriers to digital health adoption, including technological illiteracy, limited

infrastructure, and cultural resistance [7]. While digital interventions have been successful in urban settings, their effectiveness in rural areas depends on targeted education and awareness campaigns. The results suggest a need for localized digital literacy programs and collaboration with trusted community figures to increase adoption.

4.2 Effectiveness of Digital Platforms in Drug Prevention and Rehabilitation

Healthcare professionals and digital literacy experts agreed that online counseling and telehealth services offer potential benefits for drug rehabilitation. However, challenges such as poor internet connectivity and mistrust in digital platforms limit their effectiveness. A healthcare professional explained: *"Online counseling could be a great option, but many patients still prefer face-to-face interactions. They don't trust that digital consultations are confidential or effective."* Additionally, a former drug user who had participated in a rehabilitation program shared:

"I tried an online counseling session once, but I didn't feel connected to the counselor. It's easier to open up in person."

These findings support the Technology Acceptance Model (TAM), which emphasizes that perceived usefulness and ease of use influence technology adoption [14]. While digital interventions provide convenience, psychological barriers such as lack of trust and preference for traditional support systems can hinder their effectiveness. For digital interventions to succeed, they must be integrated with offline community support networks and designed to build trust through culturally appropriate engagement strategies.

4.3 Community Engagement in Digital Interventions

Interviews with community leaders and healthcare workers highlighted the importance of community involvement in promoting digital interventions. Some

successful initiatives involved peer support groups on social media and community-led drug awareness campaigns using WhatsApp and Facebook. A community leader stated: *"People trust information more when it comes from someone they know. That's why local WhatsApp groups are more effective in spreading awareness than government websites."* However, despite the potential of digital tools, most drug prevention activities still rely on in-person meetings and community discussions, as they are seen as more impactful.

These findings align with studies showing that community-led digital interventions are more effective than top-down approaches [4]. The role of peer networks and trusted local figures in promoting digital engagement is critical, as seen in similar initiatives worldwide. To maximize effectiveness, digital interventions should be designed to complement existing community structures, rather than replace them.

4.4 Challenges and Limitations of Digital Drug Prevention Programs

Key challenges identified in implementing digital drug prevention programs include: (1) limited internet access, as many rural areas still suffer from unstable network connections that hinder consistent use of online resources; (2) low digital literacy, with many individuals lacking the skills needed to navigate digital platforms effectively; (3) cultural and social stigma, where drug users fear being judged if they engage with online counseling or public digital campaigns; and (4) a lack of locally relevant content, as most digital resources are presented in formal Indonesian, while rural communities prefer localized dialects and culturally resonant messages.

These challenges mirror findings from previous studies on rural digital health initiatives [1], [2]. For digital interventions to be effective, they must be tailored to the local socio-cultural context and supported by community-based digital training programs. Designing content that reflects local values,

languages, and experiences—while building trust and digital capacity—is essential to improving participation and long-term impact.

4.5 Opportunities for Improvement

Despite the challenges, the study identified several opportunities to enhance digital drug prevention efforts in rural areas:

1. Community-Based Digital Literacy Training – Programs to educate rural populations on how to use digital platforms for health and counseling services.
2. Hybrid Approaches – Combining face-to-face community engagement with digital tools to increase acceptance.
3. Localized Content Creation – Developing videos, infographics, and podcasts in local languages to improve accessibility.

Involvement of Religious and Community Leaders – Leveraging their influence to promote digital interventions in a culturally sensitive way.

5. CONCLUSION

This study examined the implementation of community-based digital interventions for drug abuse prevention in rural Central Java. The findings reveal that while digital platforms have the potential to support drug prevention and rehabilitation efforts, their effectiveness is significantly

constrained by technological barriers, cultural stigma, and low digital literacy. Community leaders and healthcare professionals emphasized the preference for face-to-face interactions over digital counseling, highlighting the need for hybrid intervention models that integrate online resources with offline community support. A key takeaway from this research is that community engagement is essential in the success of digital drug prevention efforts. Peer networks, religious leaders, and local influencers play a crucial role in promoting trust and encouraging participation in digital initiatives. Additionally, the study underscores the need for localized content and digital literacy training to enhance accessibility and effectiveness.

To improve digital interventions in rural drug prevention, policymakers and stakeholders should focus on: (1) developing hybrid intervention models that combine digital tools with traditional community outreach efforts; (2) enhancing digital literacy programs to improve technology adoption in rural communities; (3) creating culturally relevant and localized content to improve engagement; (4) improving internet accessibility in underserved areas; and (5) leveraging trusted community figures to facilitate digital intervention uptake. By addressing these challenges, digital interventions can be more effectively utilized to support drug abuse prevention and rehabilitation efforts in rural areas, ultimately contributing to improved public health outcomes in Indonesia.

REFERENCES

- [1] H. Noviasari *et al.*, "Sosialisasi Bahaya Penyalahgunaan Narkoba bagi Generasi Muda dan Penanggulangannya di Desa Naumbai: Socialization and Intervention The Dangers of Drugs Abuse for Young Generation," *SEWAGATI J. Pengabd. Masy. Indones.*, vol. 1, no. 3, pp. 60–69, 2022.
- [2] A. Maruf, "Pendekatan Studi Islam Dalam Rehabilitasi Penyalahguna Narkoba," *J. Tawadhu*, vol. 2, no. 1, pp. 381–409, 2018.
- [3] N. M. Avena, J. Simkus, A. Lewandowski, M. S. Gold, and M. N. Potenza, "Substance Use Disorders and Behavioral Addictions During the COVID-19 Pandemic and COVID-19-Related Restrictions," *Front. Psychiatry*, vol. 12, 2021.
- [4] A. R. Iryawan, C. Stoicescu, F. Sjahrial, K. Nio, and A. Dominich, "The impact of peer support on testing, linkage to and engagement in HIV care for people who inject drugs in Indonesia: qualitative perspectives from a community-led study," *Harm Reduct. J.*, vol. 19, no. 1, p. 16, 2022.
- [5] S. Perseil, "From Prison to the Death Penalty: Human Rights Violations in the War on Drugs," in *Living with Drugs*, Elsevier, 2020, pp. 157–164.
- [6] Y. Saefudin and I. Hartiwingsih, "Rehabilitation policy for drugs abuse in Indonesia," *Indian J. Forensic Med. Toxicol.*, vol. 14, no. 4, pp. 4111–4115, 2020.
- [7] U. D. Pratiwi, M. Hanita, and K. Iskandar, "A Study of Drug Abuse Prevention and Law Enforcement in Indonesia From The Perspective of Social Control and Neurocriminology," *Tech. Soc. Sci. J.*, vol. 45, p. 460, 2023.
- [8] M. Ramadhan, D. O. Ariyanti, and R. Arifin, "Optimization of Legal Education for Drugs Abuse Prevention in Tegalrejo District Yogyakarta," *Indones. J. Advocacy Leg. Serv.*, vol. 1, no. 2, pp. 193–204, 2020.
- [9] M. Mustikawati, H. Hendrawati, W. Rahayu, and A. Karim, "Effective Communication on Adolescent Delinquency at SMK Jaya Buana," *J. Community Engagem. Heal.*, vol. 6, no. 1 SE-Articles, pp. 73–78, Mar. 2023, doi: 10.30994/jceh.v6i1.371.
- [10] E. H. J. Doelman, M. P. C. M. Luijk, I. Haen Marshall, J. Jongerling, D. Enzmann, and M. J. Steketee, "The association between child maltreatment and juvenile delinquency in the context of Situational Action Theory: Crime propensity and criminogenic exposure as mediators in a sample of European youth?," *Eur. J. Criminol.*, p. 14773708211013300, 2021.
- [11] Z. Ardi and M. Sisin, "The contribution of assertive technique behavioral counseling to minimize the juvenile delinquency behavior," *J. Konseling dan Pendidik.*, vol. 6, no. 2, pp. 67–77, 2018.
- [12] F. Daud, "Hubungan Pengetahuan dan Sikap dengan Pengelolaan Sampah Masyarakat di Kecamatan Manggala Kota Makassar," *Biol. Teach. Learn.*, vol. 5, no. 2, pp. 2039–2059, 2022, doi: 10.35580/btl.v5i2.37650.
- [13] P. Draçi and A. Laska, "Public Services, Community, and Its Involvement in Decision-Making for Local Development," *Interdiscip. J. Res. Dev.*, vol. 10, no. 1, p. 11, 2023, doi: 10.56345/ijrdv10n102.
- [14] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models," *Manage. Sci.*, vol. 35, no. 8, pp. 982–1003, 1989.
- [15] J. W. Creswell and J. D. Creswell, *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications, 2017.