

SOCIALIZATION OF THE RISKS OF POLYPHARMACY AND EDUCATION ON SAFE MEDICATION MANAGEMENT FOR ELDERLY PATIENTS WITH DEGENERATIVE DISEASES

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ABSTRAK

Peningkatan populasi lansia berdampak pada tingginya penggunaan obat yang berisiko menimbulkan masalah polifarmasi, yang dapat menyebabkan interaksi obat berbahaya dan menurunkan kualitas hidup pasien. Kegiatan pengabdian masyarakat ini bertujuan meningkatkan pemahaman Kader Pemberdayaan Masyarakat (KPM) terkait pengelolaan obat berdasarkan prinsip DAGUSIBU (Dapatkan, Gunakan, Simpan, Buang) untuk mencegah risiko polifarmasi pada lansia penderita penyakit degeneratif. Metode yang digunakan adalah Edu-Tech Empowerment Cycle yang meliputi tahapan explore, design, build, implement, dan measure. Kegiatan dilaksanakan di Desa Karangrau dengan melibatkan 20 KPM melalui penyuluhan, diskusi, dan simulasi menggunakan media buku saku dan video tutorial. Evaluasi dilakukan menggunakan kuesioner pre-test dan post-test yang dianalisis secara deskriptif. Hasil kegiatan menunjukkan peningkatan pemahaman peserta pada seluruh indikator, dengan nilai rata-rata meningkat dari 74% pada pre-test menjadi 89% pada post-test. Kesimpulan kegiatan ini menunjukkan bahwa pendekatan edukasi partisipatif berbasis teknologi efektif meningkatkan kapasitas KPM sebagai agen edukasi kesehatan, yang berpotensi mendukung perbaikan kualitas kesehatan masyarakat secara berkelanjutan, khususnya pada lansia penderita penyakit degeneratif.

Kata Kunci: DAGUSIBU; Pengelolaan Obat; Polifarmasi

ABSTRACT

The increasing elderly population has led to higher medication use, raising the risk of polypharmacy-related problems that can cause dangerous drug interactions and compromise patient quality of life. This community service program aims to improve the understanding of Community Empowerment Cadres (KPM) regarding proper drug management based on the DAGUSIBU principle (Get, Use, Store, and Dispose) to prevent polypharmacy risks in elderly patients with degenerative diseases. The method applied was the Edu-Tech Empowerment Cycle, comprising

explore, design, build, implement, and measure stages. The program was conducted in Karangrau Village, involving 20 KPM participants through counseling, discussions, and simulations using pocketbooks and video tutorials. Evaluation was carried out using pre-test and post-test questionnaires, analyzed descriptively. The results showed a significant improvement in participants' understanding across all indicators, with the average score increasing from 74% in the pre-test to 89% in the post-test. In conclusion, this technology-based participatory educational approach effectively enhances the capacity of community cadres as health education agents, potentially contributing to sustainable public health improvements, particularly for elderly patients with degenerative diseases.

Keyword: DAGUSIBU; Drug Management; Polypharmacy

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1. INTRODUCTION

The global increase in the elderly population has significantly escalated the prevalence of degenerative diseases and the subsequent need for long-term pharmacological interventions (Fatihaturahmi F. Yuliana & Yulastri, 2023; WHO, 2023). The primary phenomenon observed in Indonesia is the rising vulnerability to polypharmacy, a condition where multiple medications are used concurrently. This phenomenon directly increases the risk of drug-related problems, medication errors, and adverse health outcomes among older adults (Sari et al., 2023; Surahman, 2025). Consequently, managing medications safely at the household level has become a critical public health priority to prevent adverse outcomes and maintain the quality of life in older adults (Awali et al., 2024).

To address this phenomenon, the Indonesian Ministry of Health promotes the DAGUSIBU program (Get, Use, Store, and Dispose) as a fundamental framework for rational and safe drug utilization (Juniarti et al., 2023; Yuliana et al., 2023). However, a significant practical gap exists between the national policy and its field implementation. Despite the establishment of this program, public comprehension at the grassroots level remains suboptimal (Permadi et al., 2025). Many individuals still engage in unsafe practices, such as ignoring dosage instructions, improper drug storage, and failing to distinguish between over-the-counter and prescription medications. This highlights a persistent gap in community-level health literacy regarding safe medication management (Awali et al., 2024).

Community Empowerment Cadres (KPM) serve as a vital bridge between formal healthcare providers and the local community, making their capacity crucial for disseminating accurate health information (Wahyuni et al., 2024). Yet, preliminary observations in Karangrau Village reveal a critical knowledge gap: KPMs possess limited

understanding of the DAGUSIBU principles, particularly concerning safe medication management for the elderly (Cahyaningrum et al., 2023). Furthermore, a methodological and intervention gap is evident in current community health efforts. While previous studies have conducted DAGUSIBU socialization, the utilization of technology-based educational media (such as instructional videos and digital pocketbooks) integrated with a participatory empowerment model remains largely underdeveloped at the village level. Conventional one-way counseling methods often fail to maximize knowledge retention and practical application among grassroots health agents, restricting the effectiveness of current health promotion efforts (Rumawas & Bukhori, 2023; Teum et al., 2024).

To bridge these phenomena and gaps, innovative and technology-integrated educational approaches are essential to enhance community engagement and knowledge retention. The integration of digital and visual aids can significantly simplify complex pharmacological concepts for grassroots health agents (Damayanti & Wijayati, 2023). Therefore, this community service program aims to empower KPMs in Karangrau Village through technology-based, participatory education focused on the DAGUSIBU principles. By addressing the specific knowledge deficits of the cadres and introducing underutilized technological media, this initiative seeks to transform them into effective, sustainable health education agents. Ultimately, this empowerment is expected to mitigate the risks of polypharmacy and improve the overall quality of community health at the local level.

2. METHOD

This community service program was conducted using the Edu-Tech Empowerment Cycle framework, which encompasses five systematic stages: explore, design, build, implement, and measure. The intervention was carried out in Karangrau Village, Banyumas District, targeting 20 Community Empowerment Cadres (KPM) as the primary participants. The core objective was to enhance the cadres' competence in safe medication management for elderly patients with degenerative diseases, strictly adhering to the DAGUSIBU principle (Get, Use, Store, and Dispose). To achieve this, the program integrated participatory educational sessions, interactive discussions, and practical simulations. A pivotal element of the implementation was the deployment of technology-based educational media, specifically instructional pocketbooks and video tutorials, which were strategically designed to simplify complex pharmacological concepts and foster active, visual learning among the grassroots health agents.

To evaluate the effectiveness of the educational intervention, a quantitative approach was employed using a structured questionnaire comprising 10 Likert-scale items that covered all fundamental aspects of the DAGUSIBU principles. Data collection was executed through pre-test and post-test assessments to measure the participants' baseline and post-intervention knowledge. The acquired data were subsequently analyzed using descriptive statistics, specifically through percentage comparison, to quantify the improvement in understanding across each specific indicator. This evaluative methodology was selected for its high suitability in community service contexts, providing a clear and measurable assessment of the program's impact in upgrading the cadres' capacity as sustainable local health educators.

3. RESULTS AND DISCUSSION

RESULTS

a. Baseline Assessment of Cadre Knowledge on Medication Management

Prior to implementing the educational intervention, a comprehensive baseline assessment was conducted to evaluate the initial understanding of Community Empowerment Cadres (KPM) regarding proper medication management principles. The preliminary observation revealed significant gaps in knowledge across all four dimensions of the DAGUSIBU framework, indicating an urgent need for structured educational programs at the community level. The assessment identified thirteen specific problem areas that hindered effective medication management practices among the cadres, ranging from improper drug acquisition methods to inadequate disposal techniques. These findings underscored the critical importance of targeted capacity-building initiatives to enhance the cadres' competence as health education agents within their communities.

Table 1. Initial Observation Results of Cadre Understanding on Medication Management

No	DAGUSIBU Aspect	Identified Problems Among Cadres
1	Obtain	1. Obtaining medication without verifying official sources (pharmacy/health center)
		2. Limited understanding of differences between over-the-counter and prescription drugs
		3. Unaccustomed to asking drug information from healthcare professionals
		4. Using medication based on personal experience without consultation
2	Use	5. Not understanding dosage rules and timing of medication use
		6. Stopping medication before the recommended time
		7. Using antibiotics not according to indications
		8. Storing medication in inappropriate places (exposed to heat/humidity)
3	Store	9. Not paying attention to drug expiration dates
		10. Storing medication without original packaging or clear labels
		11. Disposing medication directly to trash without proper treatment
4	Dispose	12. Not knowing how to properly dispose of liquid medication
		13. Not understanding the characteristics of medication that is no longer suitable for use

The baseline assessment data presented in Table 1 demonstrates that cadres faced multifaceted challenges in implementing proper medication management practices. The most critical issues were observed in the "Use" category, where four distinct problems were identified, including inappropriate antibiotic usage and premature discontinuation of medication. These findings align with the observed tendency of cadres to rely on personal experience rather than professional healthcare guidance when making medication-related decisions. The storage and disposal aspects also revealed substantial knowledge deficits,

particularly regarding environmental conditions for medication storage and safe disposal methods for expired or unused pharmaceuticals.

b. Implementation of Participatory Educational Intervention

The educational program was executed through a comprehensive one-day integrated session that strategically combined theoretical instruction with practical application methods. The implementation followed the structured phases of the Edu-Tech Empowerment Cycle, beginning with formal opening and coordination sessions with village partners to establish clear objectives and build participant engagement. The material delivery employed communicative approaches using simplified language complemented by relevant case examples that reflected actual community conditions and challenges. Participants demonstrated remarkable enthusiasm throughout the sessions, actively engaging in question-and-answer segments and sharing their personal experiences related to medication practices in their respective neighborhoods.



Figure 1. Opening and Coordination Activities

The opening and coordination phase established the foundation for successful program implementation by fostering collaborative relationships between the implementation team and village stakeholders. This initial engagement ensured that all participants understood the program objectives and their roles as community health education agents. The active involvement of village officials and partners from the outset demonstrated strong institutional support for the initiative, which proved crucial for participant mobilization and program sustainability.



Figure 2. Educational Material Delivery

The material delivery sessions utilized interactive presentation methods that encouraged participant engagement and facilitated knowledge transfer through relatable examples. The educational content was specifically designed to address the knowledge gaps identified during the baseline assessment, with particular emphasis on proper medication acquisition, usage protocols, storage conditions, and disposal methods. The use of simplified language and contextually relevant case studies enabled participants to grasp complex pharmacological concepts more effectively.



Figure 3. Interactive Discussion Sessions

Interactive discussion sessions provided a platform for participants to actively engage with the material, ask questions, and share experiences from their community work. These discussions revealed that cadres frequently encountered medication-related challenges in their daily activities, including community members' resistance to following proper medication protocols. The participatory nature of these sessions enhanced learning outcomes by allowing participants to connect theoretical concepts with practical field experiences.

The educational intervention incorporated hands-on simulation activities using technology-based media, including instructional pocketbooks and video tutorials designed to reinforce learning through visual and practical demonstrations. These multimedia tools proved particularly effective in simplifying complex medication management concepts and providing cadres with accessible reference materials for future use. Participants actively practiced using these educational media during the simulations, which enhanced their confidence in applying the DAGUSIBU principles and disseminating this knowledge to community members.

c. Evaluation of Knowledge Enhancement Outcomes

Post-intervention evaluation was conducted using structured pre-test and post-test questionnaires to quantitatively measure changes in participants' understanding across all DAGUSIBU indicators. The assessment results demonstrated substantial improvements in cadre knowledge, with average scores increasing from 74% in the pre-test to 89% in the post-test, representing a 15 percentage point improvement. This significant enhancement was observed consistently across all ten evaluation indicators, suggesting that the educational approach effectively addressed the knowledge gaps identified during the initial assessment.

The uniform improvement pattern indicates that the combination of participatory learning methods and technology-based educational media successfully facilitated comprehensive understanding of medication management principles.

Table 2. Cadre Understanding Evaluation Results

No	Aspect	Evaluation Question	Pre-test (%)	Post-test (%)
1	Obtain	Knowing where to obtain safe and official medication	75	90
2	Obtain	Understanding types of medication available without prescription	72	88
3	Use	Understanding medication usage rules according to dose and time	74	89
4	Use	Knowing the importance of completing antibiotics as recommended	70	87
5	Use	Understanding risks of using medication without healthcare consultation	73	88
6	Store	Knowing proper medication storage methods	76	91
7	Store	Understanding the importance of checking medication expiration dates	78	92
8	Dispose	Knowing how to properly dispose of unused medication	72	89
9	Dispose	Understanding characteristics of medication no longer suitable for use	74	90
10	General	Understanding DAGUSIBU concept as a whole	76	87
Average			74	89

The evaluation data presented in Table 2 reveals that all indicators demonstrated positive improvement, with post-test scores ranging from 87% to 92% across different aspects of medication management. The most substantial improvements were observed in the "Store" category, where indicators achieved the highest post-test scores of 91% and 92%, suggesting that participants particularly benefited from the visual demonstrations of proper storage techniques. The "Obtain" and "Dispose" aspects also showed remarkable gains, with improvements of 15-17 percentage points, indicating that cadres developed clearer understanding of official medication sources and environmentally safe disposal practices.

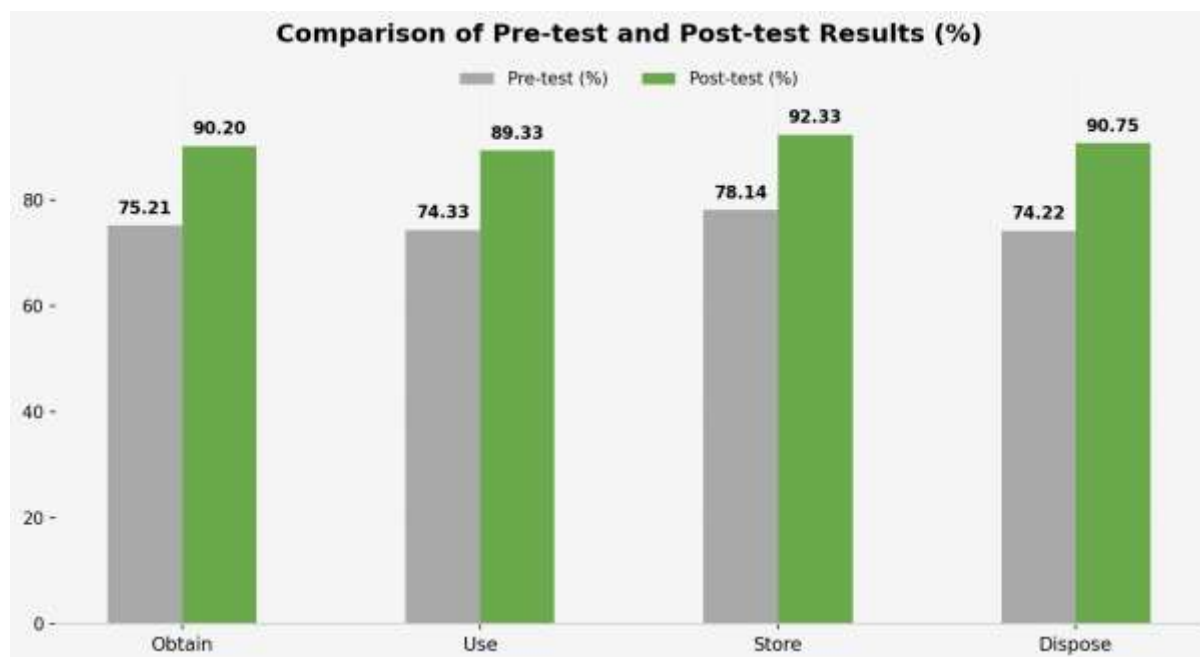


Figure 4. PKM Activity Evaluation Results

The visualization of evaluation results demonstrates a consistent upward trend across all measured indicators, providing clear evidence of the educational intervention's effectiveness. The graphical representation highlights that no indicator showed declining or stagnant performance, which validates the comprehensive nature of the educational approach. This uniform improvement pattern suggests that the integration of theoretical instruction, interactive discussions, and practical simulations created a synergistic learning environment that addressed diverse learning preferences among participants.

d. Analysis of DAGUSIBU Component-Specific Improvements

Detailed analysis of individual DAGUSIBU components reveals distinct patterns of knowledge acquisition that reflect the varying complexity and relevance of different medication management aspects. The "Obtain" component showed strong improvement, with participants developing better understanding of official medication sources and the distinction between prescription and over-the-counter pharmaceuticals. This enhancement is particularly significant given the baseline findings that revealed cadres frequently obtained medications without verifying official sources or consulting healthcare professionals. The improved knowledge in this area positions cadres to better guide community members toward safe medication acquisition practices.

The "Use" component, which initially presented the most problems during baseline assessment, demonstrated substantial progress with post-test scores ranging from 87% to 89% across three evaluation indicators. Participants showed marked improvement in understanding dosage protocols, the importance of completing antibiotic courses, and the risks associated with self-medication without professional consultation. These gains are

particularly noteworthy because improper medication usage represents one of the most common causes of adverse drug events in community settings. The enhanced understanding in this domain equips cadres with the knowledge necessary to prevent medication misuse and promote adherence to prescribed treatment regimens among elderly patients with degenerative diseases.

The "Store" and "Dispose" components achieved the highest post-test performance levels, with scores reaching 91-92% for storage-related indicators and 89-90% for disposal knowledge. This exceptional performance suggests that the visual and practical nature of the educational media particularly resonated with participants when addressing these concrete, action-oriented aspects of medication management. The strong results in proper storage knowledge are crucial for maintaining medication efficacy and preventing degradation due to environmental factors. Similarly, improved disposal knowledge addresses both safety concerns and environmental protection, as improper disposal of pharmaceuticals can contaminate water sources and pose risks to community health.

e. Effectiveness of Technology-Based Educational Media

The integration of technology-based educational media, specifically instructional pocketbooks and video tutorials, proved instrumental in achieving the observed knowledge improvements among participants. These multimedia tools addressed different learning styles by providing both visual and textual information that participants could access during and after the educational sessions. The pocketbooks served as portable reference guides that cadres could consult when facing medication-related questions in their community work, while the video tutorials offered dynamic demonstrations of proper medication management techniques that were difficult to convey through verbal instruction alone.



Figure 5. Educational Media Simulation

The simulation sessions using educational media allowed participants to practice applying DAGUSIBU principles in controlled scenarios before implementing them in real community settings. This hands-on approach built participant confidence and competence, as evidenced by their active engagement during the simulation activities. The multimedia materials were specifically designed to be culturally appropriate and linguistically accessible, ensuring that complex pharmacological concepts could be understood by cadres with varying educational backgrounds.

The effectiveness of these educational tools extended beyond the immediate training session, as participants reported intentions to utilize the pocketbooks and videos as teaching aids when educating community members. This multiplier effect amplifies the program's impact by enabling cadres to disseminate accurate medication management information to broader audiences. The technology-based approach also addresses sustainability concerns, as the digital nature of the video tutorials allows for easy distribution and updating, while the pocketbooks provide durable physical references that do not require technological infrastructure to access.

The participatory educational model, combined with technology-enhanced learning materials, created an environment that fostered active learning and knowledge retention. Participants' enthusiastic engagement throughout the program, demonstrated through their active questioning and experience-sharing, indicated that the educational approach successfully captured their interest and motivated learning. This high level of engagement is crucial for ensuring that knowledge gains translate into behavioral changes and improved practices in community health education activities. The program's success in enhancing cadre capacity demonstrates the potential of this approach to serve as a replicable model for similar community health education initiatives in other regions.

DISCUSSION

The findings of this community service program demonstrate a substantial improvement in the understanding of Community Empowerment Cadres (KPM) regarding proper medication management, with average scores increasing from 74% to 89% across all DAGUSIBU indicators. This significant enhancement underscores the critical need for structured educational interventions targeting grassroots health agents, especially considering the escalating risks associated with polypharmacy in the elderly population. As highlighted by the World Health Organization (WHO, 2023), medication safety in polypharmacy is a major global concern, requiring comprehensive strategies to prevent adverse drug events and medication errors. Furthermore, several previous studies emphasized that inappropriate medication management among geriatric patients severely compromises drug safety and increases the incidence of drug-related problems (Jiang et al., 2025; Laroche et al., 2021; Mozaffari et al., 2023). By equipping cadres with foundational knowledge of the DAGUSIBU principles, this program directly addresses these vulnerabilities at the household level, aligning with global recommendations to mitigate polypharmacy risks through proactive, community-based education.

The success of this intervention is largely attributed to the integration of technology-based educational media, specifically instructional pocketbooks and video tutorials, within a participatory learning framework. Unlike conventional one-way counseling methods, the utilization of visual and interactive media has been proven to significantly enhance knowledge retention and practical comprehension among community members. This is corroborated by Theo & Anita (2024), who found that educational videos effectively improve

public understanding of medication safety parameters and expiration awareness. Similarly, Tobi et al (2024) demonstrated that DAGUSIBU counseling utilizing engaging methods yields positive outcomes in promoting rational drug use among elderly populations. The simulation sessions in our program allowed cadres to contextualize theoretical concepts into practical applications, confirming that multimodal educational approaches are far more effective in bridging the health literacy gap than traditional lecture-based formats (Agostino et al., 2024; Elendu et al., 2024; Ferilda & Marsellinda, 2021).

Beyond mere knowledge acquisition, the improved understanding of medication acquisition, usage, storage, and disposal is expected to translate into better medication adherence and reduced risks of harmful drug interactions. Several previous studies established a strong correlation between adequate medication knowledge and high adherence rates among patients with chronic conditions, which is highly relevant to the elderly suffering from degenerative diseases (Patel et al., 2025; Selvakumar et al., 2023). In the context of polypharmacy, where patients often consume multiple medications concurrently, the risk of severe drug interactions is exponentially higher (Alhumaidi et al., 2023; Pallesen et al., 2022; Wolff et al., 2021). By educating cadres to recognize the dangers of self-medication, improper storage, and the importance of completing prescribed antibiotic courses, this program acts as a preventive measure against the complications arising from irrational drug use. Consequently, the cadres are now better positioned to guide the elderly and their families in avoiding hazardous polypharmacy practices, thereby safeguarding patient safety at the community level.

The strategic positioning of KPMs as health education agents amplifies the impact of this program, transforming localized knowledge into sustainable community-wide health practices. Community empowerment and village-level collaboration are essential pillars for successful public health initiatives, as noted by Antono et al (2024) and Ernawati et al (2024) in their studies on sustainable village development and local empowerment in the Banyumas region. When cadres are empowered with accurate health information, they serve as vital intermediaries between formal healthcare facilities and the community, ensuring that health promotion reaches the most vulnerable demographics. Larasati et al (2024) also highlighted that community-based interventions significantly improve medication adherence and health awareness among patients. Therefore, the capacity building of these cadres in Karangrau Village creates a multiplier effect, where the dissemination of DAGUSIBU principles will organically spread through their routine community interactions and neighborhood networks.

Looking forward, the sustainability of this educational model is crucial given the rising prevalence of multimorbidity and degenerative diseases among the aging population in Indonesia. Several previous studies noted that the complexity of managing multiple chronic conditions in the elderly necessitates continuous and adaptive health education strategies to prevent a decline in their quality of life (Gianfredi et al., 2025; Rony et al., 2024). While this program successfully established a foundational understanding of medication safety, ongoing

mentorship and advanced training for the cadres are required to address more complex pharmacological issues, such as specific drug-disease interactions in geriatric care (Khalil & Lee, 2018; Kim et al., 2026). Future iterations of this program should incorporate digital monitoring tools and expand the scope of training to include collaborative practices with local healthcare professionals. Ultimately, integrating technology-driven empowerment cycles into routine community service frameworks offers a scalable and resilient model for improving geriatric medication safety nationwide.

4. CONCLUSION

This community service program successfully demonstrated that the implementation of the Edu-Tech Empowerment Cycle significantly enhanced the understanding of Community Empowerment Cadres (KPM) in Karangrau Village regarding safe medication management based on the DAGUSIBU principles. The integration of participatory educational methods with technology-based media, specifically instructional pocketbooks and video tutorials, proved effective in bridging the knowledge gap identified during the initial assessment, as evidenced by the substantial increase in average evaluation scores from 74% to 89%. By transforming KPMs into competent health education agents, this initiative not only addressed immediate knowledge deficits but also established a sustainable framework for mitigating the risks of polypharmacy and improving medication safety among elderly patients with degenerative diseases at the grassroots level.

To ensure the long-term impact and scalability of this initiative, it is recommended that similar educational programs be expanded to cover broader geographical areas and involve a larger number of community cadres. Continuous mentorship and advanced training should be provided to KPMs to reinforce their knowledge and facilitate the consistent application of DAGUSIBU principles in daily community interactions. Furthermore, future developments should focus on enhancing the interactivity of digital educational media and fostering stronger collaborations between village governments, healthcare professionals, and community stakeholders to support the sustainability of health promotion efforts and optimize the role of cadres in improving public health quality.

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