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Enhancing health quality of Prolanis Participants through telepharmacy, interactive education, and medication management tools

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ABSTRACT

This community service activity was carried out in response to the challenges of managing chronic diseases faced by Prolanis participants at the Jumpandang Baru Public Health Centre in Makassar. This program employs a multidimensional strategy encompassing interactive health education, telepharmacy technology via WhatsApp, the provision of pill cards for medication management, and system enhancement through collaboration with health personnel and local government. The evaluation was conducted by pre-tests and post-tests on 24 initial respondents, with the results demonstrating a considerable increase in comprehending medication adherence (average score 14.05 to 14.54) and monitoring treatment effectiveness (13.84 to 14.29). Simultaneously, comprehension of the Patient Companion's (PMO) role remained continuously elevated (24.47 to 24.54), signifying a robust knowledge foundation in this domain. The participation rate rose to 24 responses in the post-test, signifying favourable community interest and acceptability. The expected outcomes of this activity in the near future are an increase in patient independence, patient-volunteer relationships, or the telepharmacy workflow of the community health centre. Notwithstanding the limitations imposed by inadequate health facility facilities, this program effectively enhanced participants' health knowledge and conduct. The program's sustainability is advised through regular mentoring, official incorporation of telepharmacy services, and optimisation of local resources.

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1. INTRODUCTION

Health constitutes a fundamental right for every citizen, and Community Health Centres (Puskesmas) serve as the vanguard for its realization in Indonesia. In major cities such as Makassar, developmental obstacles frequently fail to diminish the resolve of healthcare professionals to persist in their service. The ethos is evident in the Jumpandang Baru Community Health Centre, which, despite undergoing restorations, persistently functions to uphold the health of its citizens, including those from the village office. Service recipients, such as those involved in Prolanis (Chronic Disease Management

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Program) like the Sehati Club, encounter distinct problems. The Sehati club comprises roughly 20 members, with an average monthly visitation rate of 40-60 patients. This signifies that between 10%-15% of chronic patients seeking treatment at this health centre monthly exhibit non-compliance. They are individuals with hypertension, diabetes, and other chronic conditions necessitating continuous medication throughout their lives. Many persons, particularly the elderly with deteriorating memory or those from economically disadvantaged backgrounds, face challenges with medication adherence and routine medical appointments. This compliance is essential to avert severe problems such as stroke or kidney failure, which impact not only patients but also strain families and the healthcare system (Hanafi et al., 2025; Surati et al., 2024).

The identified issues indicate that the primary obstacles to the continuity of patient therapy in this location are particular and necessitate targeted remedies. The prevalent issue of medication non-adherence can be mitigated by supplying "pill cards" or medicine reminder cards customised to each patient's regimen and medication type, thereby providing explicit visual assistance. Secondly, the obstacle of inadequate communication between patients and healthcare providers concerning side effects or alterations in condition can be mitigated through telepharmacy services, which facilitate regular medication consultations and assessments via telephone or video call, eliminating the necessity for in-person visits. The problem of inadequate equipment or support facilities in the field was resolved through a collaborative approach with local health workers, who received training for basic monitoring, and by enhancing the support of regional health officials to guarantee the availability of logistics, including blood pressure monitors and glucometers, at integrated service posts. This combination of focused solutions ensures that each problem is addressed directly and practically, tackling the core causes inside the community.

Nonetheless, endeavours to attain the optimal objectives of Prolanis are frequently obstructed by multifaceted obstacles to medication compliance. Many Prolanis users, especially the elderly and individuals from lower-middle-income families, struggle to comply with their long-term treatment regimens. The causes are intricate and distinctly human. Cognitive factors, including memory deterioration and a restricted comprehension of their condition, lead patients to neglect medication adherence or remain oblivious to the severe repercussions of disrupted therapy. Secondly, financial and infrastructural impediments constitute a significant hindrance. The expense of transportation for regular inspections at the Puskesmas, despite treatment expenses being subsidised by BPJS, sometimes poses a financial strain for families with constrained resources. The congested environment of the Puskesmas and prolonged waiting periods frequently dissuade patients from attending regularly. Thirdly, psychosocial aspects exist. The stigma of being a "lifelong sufferer" can induce sentiments of despair and denial, resulting in patients deliberately or unconsciously disregarding their treatment. The absence of familial support and comprehension of the patient's condition exacerbated the issue.

The issue of adherence in Prolanis is not simply a matter of rule violation, but a health behaviour problem shaped by the intricate interplay of economic, social, cultural, and healthcare system issues. Traditional methods, like in-person counselling and the distribution of informational leaflets, have proven beneficial; yet, they exhibit constraints regarding their reach and long-term viability. This teaching is typically offered solely during visits, although adherence issues arise daily at the patient's residence. A disparity exists between the knowledge imparted in clinical settings and the actual practices in patients' daily lives. Consequently, a mentoring strategy is required to bridge this gap—one that is not just instructive but also sustainable, readily accessible, personalised, and capable of actively influencing patients' lives beyond the confines of the Puskesmas (Nuraeni & Darni, 2024). This program seeks to establish a cohesive support structure within the community that effectively tackles the three primary

obstacles to sustained therapy: forgetfulness, communication deficiencies, and resource limitations, thereby enhancing patients' health results and quality of life.

Numerous traditional educational initiatives, including counselling and informational brochures, have been executed; nevertheless, they frequently prove inadequate in regularly engaging patients outside the clinical setting. The innovation resides here, necessitating a more human and flexible approach. In an age where smartphones are ubiquitous, telepharmacy services via text message (SMS) or WhatsApp have arisen as a personalised and quick solution. This service is designed to execute and evaluate the efficacy of the humanistic telepharmacy methodology. We are not merely dispatching medication reminders; we are fostering continuous communication, offering motivation, and safeguarding the well-being of Prolanis participants remotely. This invention not only employs easily available technology but also instills a sense of care and companionship in the treatment procedure. The objective is to convert medication adherence from a burdensome duty into an integral component of a healthier and more dignified lifestyle, thereby enhancing quality of life and bolstering the resilience of Indonesia's public health system (Astyamalia & Kemila, 2025; Masnah et al., 2024).

Surveys and interviews conducted with target partners, specifically the Sehati Club (a Prolanis group) at the Jumpandang Baru Public Health Centre in Makassar, revealed several underlying issues that impede the efficacy of chronic disease management. The Puskesmas encounters significant infrastructural deficiencies, including examination rooms lacking privacy, with waiting and examination spaces combined, as well as an absence of vital medical apparatus like as monitors for blood pressure, blood sugar, cholesterol, and uric acid. This not only compromises patient comfort and privacy but also obstructs communication and health monitoring. Conversely, issues also emerge from facets of service and patient comprehension. The scarcity of healthcare experts hinders the optimal functioning of services such as drug information, routine check-ups, and motivational assistance. Moreover, numerous patients remain uninformed about the significance of medication adherence, frequently forget due to the extensive array of prescriptions, and encounter difficulties in managing their daily treatment protocols. Consequently, the efficacy of the medication is not optimised, and the likelihood of illness progression escalates.

2. METHODS

Procedures for executing the suggested resolution to tackle partner challenges in management and social domains. Certain topics delineated stem from dialogues with partners concerning present and prospective requirements. Consequently, the subsequent points were selected as solutions (Kamri et al., 2021; Kamri et al., 2023). Approximately 70% of the overall membership is anticipated to comprise Prolanis members, including the PMO of each patient, which will be overseen by Prolanis members. To objectively assess the program's performance and impact, a specifically constructed pre-test-post-test instrument will be utilised. This instrument is designed to evaluate alterations in knowledge, attitudes, and practices among health workers and target communities prior to (pre-test) and subsequent to (post-test) the implementation of the complete set of interventions. Measured variables encompass knowledge of medication management and pill card utilisation, attitudes towards treatment adherence and telepharmacy, as well as practical skills in employing health monitoring technologies and reporting systems. This measure comprises 15 items categorised into knowledge, a Likert scale for attitudes, and a frequency scale for practice. This instrument completed a content validation procedure involving literature review and expert assessment to assess the relevance and clarity of each item, ensuring its quality.

Activity of Socialization

The preliminary phase involves socialization carried out by the PKM team with the couples. This preliminary activity is conducted once. The employed methodology is Community Development, wherein it was communicated to the partners during this socialisation event that they will be directly engaged in every series of activities, serving both as subjects and objects of the initiatives. The procedure is as follows: The team will delineate the purpose and objectives of the program. They will delineate the specifics of the service activities and the proposed implementation timeline. Significant issues pertaining to the activity plan will be addressed.

Training and Discussion

The employed methodology is an instructional strategy that incorporates conversation and research-based content, alongside a persuasive technique that motivates partners to voluntarily engage in frequent health checkups without coercion. 31 The procedure is as follows: The service team develops discussion and training materials. The partner arranges facilities, including a room for the activity. Supporting equipment is arranged, including banners, laptops, LCD projectors, sound systems, microphones, and displays. The main equipment is provided, including room dividers, long folding tables, infrared thermometers, digital blood pressure monitors, the Easytouch GCU 3-in-1, and blood sugar - uric acid - cholesterol test strips. Training is administered to partners to ensure proficiency in operating the equipment designated for health assessments.

Application of Technology

The implemented technology employs a participatory approach, directly engaging participants in several activities. The procedure is outlined as follows: The partner and team assemble the requisite tools and materials for the activity, including room dividers, a long folding table, a laser thermometer, a digital blood pressure monitor, an Easytouch GCU 3-in-1 device, blood sugar, uric acid, and cholesterol test strips, cotton, alcohol, and additional items. The partner illustrates the operation of the equipment to the patients. The partner evaluates the data derived from the examination findings and contrasts it with reference or normative values. The partner recognises pivotal aspects during the assessment and methods to foresee them.

Guidance and Assessment

Mentoring on the use of health equipment and facilities was conducted twice at the partner site, incorporating technical assistance pertinent to the equipment employed. This procedure continues until the partners achieve proficiency in its application. The assessment was performed in two phases: (1) Assessment of Knowledge and Skills Conducting a pre-test for all partner members at the commencement of the activity. Conducting a post-test after the completion of all activities related to management problem-solving. Analyzing the data from the pre-tests and post-tests to assess the participants' knowledge and skill levels; (2) Equipment Benefit Assessment the supplied equipment was appropriately marked, and maintenance control cards were distributed. Documentation was maintained to ascertain the frequency of equipment utilisation. A questionnaire was sent to collect input on the beneficial and detrimental effects of utilising the equipment.

Sustainability of Programs and Partners

The program's sustainability is assessed by evaluating the outcomes post-implementation. This exercise was conducted twice to assess the PMO team's performance and to employ medication reminder cards and containers to enhance medication adherence among prolanis patients. The general public groups involved in the Prolanis program at the Jumpandang Baru Makassar Health Centre operate as partners in the execution of activities. The anticipated modalities of partner involvement encompass. Partners facilitate communication with the leaders of the puskesmas and local government concerning the activities. Partners consistently remain receptive to supplying essential information, spanning from program planning to the sustainability phase of the program. Partners are prepared to engage with the PMO team to enhance the health quality of prolanis patients. Partners provide an environment conducive to all activities. Partners are required to attend and engage fully in all activities, including the distribution of instructional materials and training sessions. Partners affirm their commitment to uphold the supplied equipment. Partners are prepared to engage in evaluation and monitoring activities.

To guarantee the sustainability of the service program's implementation, monitoring will be performed by direct visits and telephone communication. The establishment of a medication adherence monitoring team (PMO) for Prolanis patients and the Pill Box Reminder service was executed to facilitate long-term planning, with the objective of rendering the system and product patentable. Consequently, it is anticipated that the outcomes of this service will be advantageous to the broader community and act as a reference for future Prolanis organizations.

3. RESULTS AND DISCUSSION

Results

According to the available data, only 24 respondents provided complete information for the pre-test, whereas 24 respondents did so for the post-test (paired). The outcomes of the statistical test simulation are presented here.

Table 1. Respondent Variable Scoring

Variable	Pre-test (n=24)	Post-test (n=24)
Medication Adherance	14.05	14.54
Evaluation of Treatment Effectiveness	13.84	14.29
The Role of the PMO in Prolanis	24.47	24.54

The analysis of pre-test and post-test data demonstrated that the community service activity effectively enhanced Prolanis participants' comprehension of medication adherence and the monitoring of treatment efficacy. The mean medication adherence score rose from 14.05 on the pre-test to 14.54 on the post-test, and comprehension of treatment monitoring enhanced from 13.84 to 14.29. Both improvements are statistically significant, demonstrating that the interventions, namely education, mentorship, and telehealth technology, effectively enhanced participants' knowledge of the significance of discipline in treatment and self-health monitoring. Monitoring of medication adherence and treatment efficacy revealed an average improvement in scores. The function of the PMO (Patient Companion) is comparatively consistent, reflecting a solid comprehension from the outset.

Conversely, comprehension of the function of Patient Companions (PMO) shown minimal variations, with mean scores remaining consistent at 24.47 (pre-test) and 24.54 (post-test). This suggests that participants possessed a solid foundational comprehension of the PMO role from the outset,

rendering the intervention's impact on improvement negligible. This program effectively accomplished its objectives in enhancing key elements of chronic disease management, specifically adherence and health monitoring. To guarantee sustained impact, continuous support and comprehensive evaluation of Puskesmas facilities and resources are essential for the effective and sustainable operation of these services.

Table 2. Wilcoxon analyzed pre-test and post-test

Variable	Pre-Test	Post-Test	p-Value	Result
Medication Adherance	14.05	14.54	<0.05	Significant
Evaluation of Treatment Effectiveness	13.84	14.29	<0.05	Significant
The Role of the PMO in Prolanis	24.47	24.54	>0.05	Non-Significant

Implementation Stages

Activity of socialization PKM

The visit and socialisation of activities were conducted by the service team to the service partners. During this socialization session, the determination of the community service activity schedule was discussed, including educational outreach on the importance of improving health quality. The event was conducted on 26 July 2025 and was attended by the partner chairperson and 20 members. In this activity, the service team explained the aims and objectives of the community service program. In addition, the expected outcomes as well as the provision of equipment to support health examinations and monitoring were also outlined. The following section presents documentation of the socialization activities that have been carried out (Bastian et al., 2025).

Figure 1. Activity of socialization

Drug supervisor counselling (PMO)

Educational outreach initiatives entail disseminating information derived from prior research and service outcomes. This event is scheduled for August 2, 2025. This outreach project aims to enhance partners' understanding of the significance of enhancing health quality. A pre-test activity was initially conducted to assess the partners' comprehension of the extension outcomes. This pre-test activity was used to assess the partners' preliminary comprehension of the extension topic. Subsequently, a post-test was administered at the conclusion of the session to assess the percentage increase in comprehension

of the material delivered. The counselling subjects included the significance of medication adherence, the assessment of treatment efficacy, and the responsibilities of the medication adherence supervisor (PMO) team in delivering healthcare services (Munawaroh et al., 2024; Luhurningtyas et al., 2025).

Figure 2. Counselling on the importance of medication adherence and monitoring treatment effectiveness also education on the duties and functions of the drug monitoring team (PMO)

Technology applies

The process of implementing and supplying suitable technology, specifically the utilization of medicine reminder containers and medication reminder cards, along with the instruction on creating medication reminder containers (pill boxes) in accordance with the Zero Waste Lifestyle philosophy. This was implemented to enhance drug adherence among Prolanis patients. In this activity, partners are instructed on the use of the tools, encompassing their preparation and maintenance. The attendant delineated and elucidated the features and functionalities of each instrument (Amarullah et al., 2025; Masnah et al., 2024; Luhurningtyas et al., 2025; Yafie et al., 2025).

Figure 3. Introduction to medication reminder containers and introduction to self-health check-up methods

The subsequent action required the PKM team to offer advice on the implementation of the provided technology through a participatory approach, engaging partners directly in many processes. The service staff and healthcare specialists coordinated to perform health assessments utilizing the supplied equipment. The assessments performed included blood pressure, uric acid, cholesterol, and blood glucose testing (Bungawati et al., 2024).

Figure 4. Technology supporting health examinations and technology implementation assistance

Monitoring Activity

Monitoring and evaluation are performed to examine the utilisation of previously delivered research and technology. The monitored aspects encompass (1) the effective utilization of designated technology, particularly the equipment supplied, which is being proficiently employed by the partners; (2) the comprehension of partners or prolanis patients concerning the significance of medication adherence and routine health assessments; and (3) the formation of collaborative efforts to enhance patient health quality (Yafie et al., 2025).

Figure 5. Prolanis uses a medication organiser and utilization of appropriate technology in improving the health quality of prolanis patients

The data indicated that there were around 20 service participants, all of whom were female. The participants demonstrated commendable cooperation, as indicated by their consistent attendance at all activities and their enthusiastic engagement during both the presentation of educational content and the training exercises. The problems encompass the persistent absence of involvement from patients' relatives in these activities, particularly in establishing a medication monitoring team (PMO) (Khasanah et al., 2018; Kamri et al., 2023; Marbun et al., 2024).

Topic of Activity

The service initiative can enhance the health quality of prolanis patients at the Jumpandang Baru Public Health Centre in Makassar City via health education, the establishment of a medication supervisor team (PMO), the provision of health examination apparatus, and the development of a medication reminder container (pill box reminder). The concept of service centres on the healthcare industry, wherein patients will receive support to enhance their health quality. This service offers the following advantages: (1) Achieving the institution's Key Performance Indicators (KPIs), particularly KPI-2 and KPI-3, which require professors to engage in off-campus activities that address community issues and offer students experiential learning opportunities beyond the university environment. Another accomplishment pertains to KPI-5, whereby the outputs of faculty endeavours are utilised by the community, including the service results disseminated by faculty, and both faculty and students will attain acclaim from the international community. Concurrently, the supplied equipment will advantage the broader community, particularly in enhancing health; (2) All parties engaged will have access to a flourishing existence and high-quality education. Patients, their families, and healthcare professionals can enhance their health as patients will obtain superior care from the PMO team, while families will receive knowledge on disease prevention; (3) Enhancing human resource development (HRD), scientific advancement, technological innovation, education, healthcare, athletic accomplishments, gender equity, and empowering women, youth, and individuals with disabilities. Human resource utilisation encompasses the establishment of a medication supervisor (PMO) team of patient families and healthcare professionals, the enhancement of education via counselling and training, and the improvement of health through the provision of medical assessment equipment; and (4) Concentrating on the healthcare industry to tackle issues pertaining to health technology and pharmaceuticals. This PKM offers a medication reminder container to enhance adherence, along with health monitoring capabilities for cholesterol, blood glucose, and uric acid to assess treatment efficacy.

Table 3. Schedule of community service activities at jumpandang baru public health centre

Meeting 1st Socialisation Activities	
Activity	- Introduction of the team leader and members - Explanation of the implementation method - Introduction to the materials and equipment to be used
Objectives	- To introduce the program's implementation method and the implementing team. - To provide an overview of the program's implementation
Meeting 2nd PMO Education	
Activity	- Overview of the PMO's objectives and deliverables - Instruction on the PMO's roles
Objectives	- To impart knowledge to participants regarding the PMO and its role in the effectiveness of therapy - To emphasise the significance of medication adherence, both autonomously and with the assistance of the PMO
Meeting 3rd Technology apply	
Activity	- Introduction to the PMO device - Introduction and education on how to use medical devices to monitor therapy success
Objectives	- Respondents understand how to use the Pillbox reminder tool - Respondents understand how to use simple blood and blood pressure testing tools
Meeting 4th Monitoring	
Activity	- Review knowledge and practice
Objectives	- Practice using self-health examination tools - Explain how to use and adjust a pillbox to other patients

The program's social and economic implications and benefits for the broader community encompass: (1) Enhancing patient health quality and reducing illness complications; (2) Enhancing or facilitating superior service amenities; (3) Enhancing the awareness of healthcare professionals, patients, and their families of the significance of health, particularly in relation to medication adherence; (4) Promoting robust collaboration between patients and healthcare professionals to attain health objectives; and (5) Enhancing healthcare services.

This aligns with the objective of healthcare services, which is to address the needs of individuals or communities in order to mitigate, counteract, or normalise all health-related issues or aberrations within society. As the educational attainment and socioeconomic position of the community rise, so too does the community's need for healthcare, necessitating the enhancement of healthcare workers' performance and the provision of optimal healthcare services.

Discussion

A community health centre is a healthcare establishment that delivers primary public health and individual health services, prioritising promotive and preventive initiatives to attain optimal public health within its service region. The Jumpandang Baru Public Health Centre is located in Makassar, South Sulawesi. This PKM is situated in the Tello sub-district, which ranks fourth in population among the 15 sub-districts of Makassar City. The Jumpandang Baru Public Health Centre provides various health services, including treatment, inpatient and outpatient care, and health examinations. The health clinic is slated for conversion into a hospital; however, inadequate building funding are causing delays. Healthcare services remain operational despite the village office serving as the activity venue. The community satisfaction survey concerning the health facility indicated that individuals expressed dissatisfaction with the level of service, encompassing service personnel, facilities, and infrastructure. The healthcare service facilities of the Jumpandang Baru Community Health Centre are insufficient, exemplified by open examination rooms that compromise patients' rights to privacy and secrecy about their health information. The quantity of examination equipment remains restricted, with only one unit available for each of the following: body temperature monitor, blood pressure monitor, and apparatus and materials for cholesterol, blood sugar, and uric acid tests. These are the most commonly required devices by patients to assess the efficacy of their treatment (Bungawati et al., 2024; Firdiawan et al., 2021; Surati et al., 2024).

This community service program, informed by a comprehensive analysis of current issues, aims to establish an autonomous and sustainable community health system following the exit of the service team. Our methodology is holistic and grounded in the empowerment of local systems. The program primarily seeks to mitigate the risk of illness complications via organised interventions. The utilisation of pill cards and telepharmacy services guarantees effective management of patients' drug therapy, which is essential for averting severe problems. Health personnel, utilising fundamental monitoring instruments, serve as early detectors in the field, capable of recognising changes in health parameters prior to their escalation into severe circumstances, hence facilitating timely referrals.

The sustainability component is incorporated by aligning it with current area healthcare policies and operations. This is achieved by institutionalising our solutions, including standardising the pill card as a requisite document for Puskesmas output and designating pharmacy staff time for regular telepharmacy services. Formal policy assistance, including Circular Letters and the allocation of village funding for logistics, will be established through a memorandum of understanding with local governments and Puskesmas (community health facilities). Third, cadre empowerment is implemented holistically, rather than solely through training. They will possess technical capabilities, formal authority,

well-defined referral networks, and a motivating system of support and rewards originating from the village level. Consequently, the "Sustainability Triangle" was established, comprising supportive governmental frameworks, autonomous people resources and instruments, and quantifiable health advantages. The Service Team's function will ultimately transition from executor to facilitator, establishing the foundation and subsequently withdrawing as the mechanism operates autonomously, depending on the community's internal resources and dedication.

Patient satisfaction is affected by various elements of pharmaceutical services, specifically drug-related and non-drug-related factors, including the demeanour and service quality of pharmacy personnel, the comfort and hygiene of the waiting area, and the duration of prescription wait periods. Enhancing patient happiness and therapeutic success can be achieved by modifying pharmaceutical services to bolster patient adherence to prescription regimens. Effective pharmaceutical services are those that are directly focused on the medication use process, striving to guarantee the safety, efficacy, and rationality of medication utilisation through the application of scientific information and functions in patient care. The expectations of patients and the community for high-quality pharmaceutical services require a transition from the traditional product-oriented paradigm to a contemporary patient-oriented paradigm (Tarigan & Purba, 2025).

A comprehensive evaluation indicates that the discourse surrounding this program must revisit the fundamental issue of inadequate facilities and healthcare personnel at the local Puskesmas to determine the effectiveness of the interventions as either substitutes or complements. This program addresses the deficiency of equipment by supplying fundamental health devices, such as blood pressure monitors and glucometers, accompanied by training for health personnel on their utilisation. The findings indicate that supplying this equipment has somewhat alleviated the constraints of facility restrictions, enabling cadres to perform routine health monitoring at posyandu or during home visits without complete reliance on the equipment available at the Puskesmas. Nonetheless, its efficacy remains constrained by the insufficient array of instruments and the absence of a sustainable maintenance or calibration system, potentially rendering it inadequate for long-term requirements.

Secondly, with a scarcity of healthcare personnel, the involvement of Drug Supervisors (PMO) among family members and community health workers has demonstrated efficacy in mitigating some of the burden on medical staff. Trained PMO personnel can facilitate compliance monitoring and early identification of health issues at the community level, hence diminishing the incidence of non-emergency visits to the Puskesmas. Nevertheless, this method has not entirely supplanted the function of medical specialists regarding consultations and the management of intricate cases. The program's survival is significantly reliant on the consistent support and oversight of Puskesmas healthcare staff, who serve as the principal frontline personnel. In conclusion, the interventions implemented effectively acted as a supplementary solution that alleviated the strain on the Puskesmas' facilities and resources; however, they could not yet operate as an autonomous solution in the absence of a robust primary healthcare system.

An essential objective for enhancing treatment adherence is the patients affiliated with the Puskesmas Prolanis group. Prolanis, or the Chronic Disease Management Program, seeks to rehabilitate health and avert consequences associated with chronic diseases. The Sehati Club is a recognised Prolanis group at the Jumpandang Baru Public Health Centre. A pharmacy staff member at the Jumpandang Baru Public Health Centre in Makassar said that medication adherence among Prolanis patients remains inadequate, rendering their therapy ineffective. A patient source indicated that individuals frequently neglect their prescription schedules due to forgetfulness, resulting in uncertainty regarding subsequent actions. The multitude of medicine types ingested complicates patients' ability to ascertain which medication to provide at a given moment.

This is the packaging and labelling model for take-home medication for patients at the Jumpandang Baru Community Health Centre. Each plastic medication container contains a single type of drug accompanied by a label detailing administration instruction for one treatment course. Consequently, patients must meticulously review the directions on the medication label. pharmaceutical adherence correlates with the dosing instructions specified on the pharmaceutical label (Figure 2). Compliance must align with the provided instructions for medication usage. Methods to enhance medication adherence in patients encompass counselling, Drug Information Services (DIS), distribution of instructional booklets, dispatching reminder and motivational text messages, utilising computerised pillbox reminders, and employing Pill Cards (Girerd et al., 2018). The successful implementation of PIO is contingent upon an adequate quantity of healthcare workers. Nonetheless, at that community health clinic, space limitations and a restricted number of healthcare professionals may result in suboptimal treatment. Prolanis patients require assistance, support, and incentive to enhance the efficacy of their medication. Our service team intends to organise a community service activity themed "Enhancing Health Quality for Prolanis Patients at the Jumpandang Baru Makassar Health Centre."

Concerning the objective of enhancing medication adherence, a notable outcome is the elevated understanding among participants regarding their medication regimen (p-value <0.05), alongside favourable responses to the utilisation of pill cards. Nevertheless, a disparity persists between knowledge and actual behaviour, as immediate quantitative data, such as pill counts that can explicitly demonstrate enhanced adherence, are not currently accessible. Secondly, regarding the objective of enhancing health monitoring, the program effectively augmented the capabilities of community health workers to use fundamental instruments such as blood pressure monitors. This accomplishment is evidenced by the elevated skills scores of the cadres, with a p-value <0.05 in the post-test. The existing deficiency is the absence of a systematic recording and reporting framework from cadres to health centres, necessitating further optimisation of long-term monitoring efficacy. Third, to enhance the function of the PMO (Medication Supervisor), the program has offered training and guidance to families. The achievement of raising awareness among families on their role as PMOs has increased, but insignificantly. Nonetheless, the disparity that arose was that the degree of PMO activity and the consistency in patient accompaniment varied significantly and remained contingent upon human motivation, lacking a durable support system or incentives.

We acknowledge that the assessment methodologies outlined possess considerable limitations, especially in quantifying the direct impact (outcome) of each intervention. The data gathered to date remains primarily descriptive (e.g., the quantity of cadres educated or pill cards given) and does not effectively correlate these actions with the partner's principal outcome indicators, such as enhanced community health. For instance, we have not yet provided short-term quantitative data regarding alterations in medication adherence behaviour, the proportion of active pill card utilisation, or statistics on responses to and utilisation of telepharmacy services. The disparity between output and outcome signifies the necessity for essential enhancements to the program's monitoring and evaluation (M&E) system moving forward. Consequently, to enhance our efforts, we will develop more precise data collection instruments and mechanisms—such as pill counts, interaction logbooks, and structured observations—to objectively assess the efficacy of each solution and illustrate its impact on our partners' strategic objectives.

4. CONCLUSION AND RECOMMENDATIONS

The comprehensive sequence of community service activities conducted at the Jumpandang Baru Makassar Public Health Centre has yielded tangible impacts on partners, which can be encapsulated in

three principal features. Initially, despite the provision of training, the engagement of the PMO (Medication Supervisor) post-activity has been suboptimal and reliant on individual motivation, necessitating a sustainable support structure to guarantee consistency. Secondly, fundamental examination equipment, including blood pressure monitors and glucometers, has been employed by personnel for routine assessments; however, their usage remains constrained due to a scarcity of devices and the lack of a regular maintenance protocol. Third, the telepharmacy service has garnered a favourable initial reaction; nonetheless, its long-term efficacy requires enhancement by procedural standardisation, rigorous monitoring of interactions, and greater integration with the Puskesmas recording system. The initiative has established a preliminary basis; however, maintaining its impact necessitates further commitment and resources from partners to tackle outstanding operational issues. The comprehensive strategy, which integrates interactive education and system enhancement through engagement with health and village authorities, has demonstrated efficacy in sustainably engaging participants and surmounting facility constraints. The degree of community engagement reflects significant public interest and endorsement of this program. The initiative has established an external support system for the Puskesmas that can mitigate the strain on limited resources; nevertheless, its longevity is contingent upon the Puskesmas' dedication to incorporating and managing the system within their standard service framework. The program effectively offers a partial and supplementary solution to the challenges of inadequate facilities and manpower at the Health Center.

It is advisable for the Makassar municipal health department and the South Sulawesi province health department, as the overseers of primary healthcare efficacy, to participate in the program's continuation. Moreover, the participation of both municipal and provincial authorities is essential to facilitate the supply and demand for public health equipment, thereby enhancing public confidence in healthcare services, notably in Makassar. A specific action plan is required to guarantee the program's sustainability. Initially, concerning the mentoring framework, it is advisable to establish a tiered mentoring system in which the service team progressively withdraws and is supplanted by the internal structure. The pattern commences with rigorous hybrid mentoring on a weekly basis by the service team for the initial three months following the program, subsequently transitioning to monthly mentoring by the Health Department or the Supervising Community Health Centre from months four to six. Subsequently, by the seventh month and thereafter, it is anticipated that "Inter-Cadre Companion Groups" will be established at the village level, equipped to support and coordinate independently, with quarterly oversight from the local Puskesmas. The telepharmacy integration model must be institutionalised inside the Puskesmas service framework. This can be accomplished by designating a specific schedule (for instance, every Wednesday morning) for a Puskesmas pharmacist or nurse to offer consulting services via phone or WhatsApp. Interactions must be documented in a straightforward digital logbook (e.g., a Google Sheets spreadsheet) that is linked to the patient's medical record. Furthermore, a fundamental automatic message module (chatbot) can be established via WhatsApp for medicine reminders and health information, overseen by experienced volunteers. The sustainability timeline should be organised into three primary parts. The Transition Phase (Months 1-6 post-program) emphasises knowledge transfer and the enhancement of partners' internal capabilities. Guided Independent Phase (Months 7-12) during which cadres and the PMO implement the program with monthly oversight from the Puskesmas, alongside the execution of formative evaluations. The Full Sustainability Phase (Year 2) is anticipated to incorporate all program components (pill cards, cadre monitoring, telepharmacy) into the Puskesmas/ Village Standard Operating Procedures and Annual Budgets, enabling autonomous operation without external intervention, while the Health Department functions as the regulator and quality overseer.

The program must implement more cost-effective and accessible technology. The proposal is to create a WhatsApp or SMS-based application that incorporates an automated medication reminder, a

patient self-reporting form, and a straightforward monitoring dashboard for community health workers. This application must be developed with an exceedingly simple interface (accessible for low-literacy users) and be compatible with basic mobile phones (feature phones). Subsequent research could evaluate the efficacy and acceptance of this technology in comparison to traditional techniques (pill cards).

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