KNOWLEDGE TO PRACTICE: ENHANCING POSYANDU CADRES' COMPETENCE IN METABOLIC SYNDROME SCREENING AND EDUCATION

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ABSTRACT

Metabolic syndrome (MS) is a growing public health problem, characterized by central obesity, high blood sugar levels, increased blood pressure, and lipid profile disorders that can increase the risk of cardiovascular disease. This community service activity was carried out to strengthen the competence of Posyandu cadres in the Tahtul Yaman Community Health Center (Puskesmas) work area in Jambi City in conducting early detection and providing education about MS. The program was implemented through three main stages: module development, module-based training, and direct mentoring in the field. The training module was designed by integrating the Health Belief Model (HBM) approach and andragogy principles, so that the learning process was more participatory and oriented towards the cadres' real-life experiences. A total of 15 cadres from nine Posyandus actively participated in this activity. Evaluation was carried out through pre- and post-tests to assess knowledge gains, and the Direct Observation of Procedural Skills (DOPS) method to measure practical skills. The results showed a significant increase in knowledge scores, with the pass rate increasing from 73.33% to 100% after the training. Cadres were able to implement screening procedures according to standards and explain the examination results well. However, the communication-education aspect still needs strengthening to make health messages more easily accepted by the public. Overall, this program has proven effective in increasing the capacity of Posyandu cadres as the frontline of promotive and preventive health services at the community level.

Keywords: Metabolic Syndrome, Posyandu Cadres, Increasing Knowledge, Skills, Education and Screening.

ABSTRAK

Sindroma metabolik (SM) merupakan salah satu masalah kesehatan masyarakat yang terus meningkat, ditandai dengan adanya obesitas sentral, kadar gula darah tinggi, tekanan darah meningkat, dan gangguan profil lemak yang dapat memperbesar risiko penyakit kardiovaskular. Kegiatan pengabdian masyarakat ini dilakukan untuk memperkuat kompetensi kader Posyandu di wilayah kerja Puskesmas Tahtul Yaman Kota Jambi dalam melakukan deteksi dini dan memberikan edukasi mengenai SM. Program dilaksanakan melalui tiga tahap utama, yaitu penyusunan modul, pelatihan berbasis modul, dan pendampingan langsung di lapangan. Modul pelatihan dirancang dengan mengintegrasikan pendekatan Health Belief Model (HBM) dan prinsip andragogi, sehingga proses belajar lebih partisipatif dan berorientasi pada pengalaman nyata kader. Sebanyak 15 kader dari sembilan Posyandu berpartisipasi aktif dalam kegiatan ini. Evaluasi dilakukan melalui pre-test dan post-test untuk menilai peningkatan pengetahuan, serta metode Direct Observation of Procedural Skills (DOPS) untuk mengukur keterampilan praktik. Hasil menunjukkan adanya peningkatan skor pengetahuan yang bermakna, dengan tingkat kelulusan naik dari 73,33% menjadi 100% setelah pelatihan. Kader mampu menerapkan prosedur skrining sesuai standar dan menjelaskan hasil pemeriksaan dengan baik. Meski demikian, aspek komunikasi-edukatif masih perlu penguatan agar pesan kesehatan dapat lebih mudah diterima masyarakat. Secara keseluruhan, program ini terbukti efektif dalam meningkatkan kapasitas kader Posyandu sebagai garda terdepan pelayanan kesehatan promotif dan preventif di tingkat komunitas.

Kata kunci: *Sindroma Metabolik, Kader Posyandu, Peningkatan Pengetahuan, Keterampilan, Edukasi dan Skrining.*

INTRODUCTION

Metabolic syndrome (MS) is currently a growing public health concern. The global prevalence of metabolic syndrome is estimated to reach 20–25% in the adult population[1]. In Asia, including Indonesia, this figure is trending even higher due to lifestyle changes, urbanization, and the increasing prevalence of obesity [2,3]. RISKESDAS data shows a significant increase in various MS risk factors, such as central obesity, hypertension, and type 2 diabetes mellitus, over the past decade [4,5]. In Jambi Province alone, the prevalence of hypertension and type 2 diabetes mellitus is quite high, indicating a public health burden that requires targeted intervention.

MS is characterized by a combination of central obesity, hyperglycemia, hypertension, hypertriglyceridemia, and low HDL cholesterol levels. This combination of risk factors synergistically increases the likelihood of developing cardiovascular and cerebrovascular disease by up to threefold [6–8]. Thus, MS plays a significant role as a major contributor to high morbidity and mortality rates, while also posing a major challenge to efforts to control Non-Communicable Diseases (NCDs) in Indonesia[9–11].

This situation is also reflected in the Tahtul Yaman Community Health Center (Puskesmas) in Jambi City, where the prevalence of hypertension and type 2 diabetes mellitus is quite high among both the productive age group and the elderly. However, the capacity of Posyandu (Integrated Health Post) cadres to conduct early detection and education related to metabolic syndrome remains limited. Online training through the “Satu Sehat” portal is difficult to access due to digital literacy challenges and limited network infrastructure[12]. This situation necessitates alternative offline training. However, to date, offline training based on the metabolic syndrome module has never been conducted. This is despite the fact that capacity building for cadres is highly relevant to the risk profile of the local population. As a result, the implementation of metabolic syndrome screening has not been optimal and has not yet reached a wide community.

Training for Posyandu cadres, designed based on andragogical principles in a contextual and applicable manner, is a strategic step to bridge the gap between knowledge and practice[13]. This training not only focuses on improving cadres' knowledge but also strengthens technical skills such as measuring waist circumference, blood pressure, and identifying simple risk signs of metabolic syndrome. Furthermore, this activity emphasizes communication skills and health education so that cadres can effectively convey promotive and preventive messages to the community. This effort aligns with national policy directions through the Primary Service Integration Program (ILP), which positions Integrated Health Posts (Posyandu) as the vanguard of promotive and preventive services at the community level[14,15]. Posyandu cadres play a key role in bringing health services closer to groups vulnerable to MS and other NCDs. Therefore, improving cadre competency through practice-based training is a strategic step in strengthening Posyandu's role in the era of healthcare transformation[16].

This training approach draws on Adult Learning Theory (Knowles), which emphasizes that adult learners learn more effectively through direct experience, discussion, and simulation than through lectures[17]. Furthermore, the Health Belief Model (HBM) framework is used to enhance cadres' perceptions of MS risk as a motivator for screening. This approach is reinforced by the Theory of Planned Behavior, which highlights the importance of attitudes, social norms, and perceived behavioral control in shaping cadres' intentions to consistently engage in early detection[18]. Therefore, this training is expected to transform cadres' knowledge into concrete skills and behaviors in early detection and health education related to MS.

This activity is based on the principle of community empowerment, which emphasizes strengthening individual capacity to play an active role in improving the health of their environment. This intervention supports the implementation of Primary Care Integration (ILP), the Impactful Science Program of the Ministry of Education, Culture, Research, and Technology, and contributes to the achievement of Sustainable Development Goals (SDGs) Goal 3: Good Health and Well-Being, which emphasizes the importance of ensuring healthy lives and improving well-being for all ages. Thus, this initiative is expected to have a real impact in improving the competence of Posyandu cadres and strengthening the early detection system for MS at the community level.

METHODS

This community service program was carried out in August 2026 in the working area of the Tahtul Yaman Community Health Center and involved all active Posyandu cadres. The method consisted of three interconnected stages: planning, training, and field mentoring, designed to strengthen cadres’ abilities in screening and educating the community about Metabolic Syndrome (MS). The planning stage began with a situation analysis through interviews and review of existing data from the health center. This helped the team understand the current conditions, challenges faced by cadres, and obstacles in MS screening at the community level. Together with the partner, the team then held a Focus Group Discussion (FGD) to determine which issues were most urgent to address, considering real needs, available resources, and the importance of improving promotive and preventive services at Posyandu.

From this process, the team developed a practical and evidence-based training module, along with pre- and post-test instruments to measure changes in knowledge and skills. These materials were reviewed internally and refined based on input from the health center. The training was conducted offline and included the distribution of the MS module, presentation of material by an internist, administration of tests, and hands-on practice of basic screening procedures such as measuring weight, height, waist circumference, and blood pressure.

The final stage was field mentoring at Posyandus, where cadres practiced directly under supervision. Their skills were assessed using the Direct Observation of Procedural Skills (DOPS) method, followed by personalized feedback to help them apply the training effectively and build confidence in providing MS screening and education to the community.

RESULTS AND DISCUSSION

1. Compilation of Metabolic Syndrome Module

The development of a Metabolic Syndrome training module was carried out as an initial stage of community service activities to ensure the suitability of the material to the needs of cadres and the context of primary care in the Tahtul Yaman Community Health Center (Puskesmas) work area. The development process involved a team of lecturers, health practitioners, and Puskesmas officials to produce a module based on evidence-based practice and easily applied by cadres in the field. This module covers the basic concepts of metabolic syndrome, risk factor identification, simple screening procedures, and educational communication techniques for the community. The module development integrated the Health Belief Model (HBM) approach and andragogy principles, where the material was designed interactively and applicably to suit the characteristics of adult learners. Based on the HBM, the module's primary focus is on vulnerable groups with an emphasis on the benefits of screening, risk perception, and motivation for healthy behaviors [19,20]. Meanwhile, andragogy principles are applied through a participatory learning approach based on the cadres' experiences, case discussions, and reflections to deepen understanding [17]. Validation of the module content was conducted internally by internal medicine experts and the academic team to ensure scientific accuracy and relevance to the context of application in the field. With this module, it is hoped that there will be increased literacy among Posyandu cadres in conducting early detection and ongoing education regarding metabolic syndrome at the community level.

Figure 1. Metabolic Syndrome Module

2. Module Based Training

a. Respondents Of Community Service Activities

Community service activities conducted in the Tahtul Yaman Community Health Center area were attended by cadres from several Integrated Health Posts (Posyandu), as shown in **Table 1**.

Table 1. Distribution of Integrated Health Posts in the Working Area of the Tahtul Yaman Community Health Center.

No.	Posyandu
1	Cempaka 2
2	Pinang Merah
3	Mawar
4	Melati 3
5	Melati 1
6	Asoka 1
7	Asoka 3
8	Cempaka 3
9	Melati 2

Based on **Table 1**, it is known that nine integrated health posts (Posyandu) participated in community service activities in the Tahtul Yaman Community Health Center (Puskesmas) work area (Table 1). The number of cadres present represented each Posyandu, ensuring a fairly even distribution of participants from across the target area. This strengthens the cadres' role as extensions of health workers in delivering messages and providing education at the community level.

Figure 2. Participants in community service activities

b. Distribution of Metabolic Syndrome Training Modules to Posyandu Cadres

The cadres were provided with a metabolic syndrome module as reading material and a practical guide. The module contains concise information on the definition of metabolic syndrome, risk factors, signs and symptoms, early detection methods at the community level, and promotive and preventive measures that can be implemented at the Integrated Health Post (Posyandu). The purpose of distributing this module is to provide cadres with a written reference that they can reuse when educating the community, rather than relying solely on memory from training. According to Ramadhan et al., (2019), providing printed media in the form of modules or pocket books can increase cadres' independence in providing health education and strengthen the consistency of the health messages they convey[21].

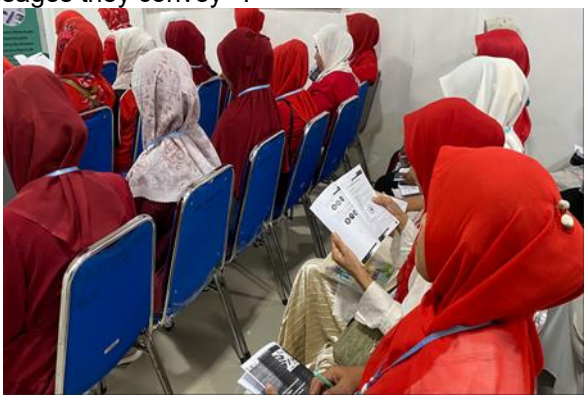

Figure 3. Distribution Metabolic Syndrome Modules to Posyandu Cadres.

c. Material Delivery Activity by Specialist Doctors (Internal Medicine Specialists)

The presentation on screening and early detection of metabolic syndrome was delivered by dr. Afifah Amatullah, Sp.PD. The material covered the definition, risk factors, clinical signs, and simple procedures that cadres can perform in the field to detect the risk of metabolic syndrome. A key emphasis was placed on understanding the diagnostic criteria: central obesity (waist circumference), high blood pressure, elevated fasting blood glucose levels, high triglycerides, and low HDL levels[22].

In this session, participants were explained how to measure waist circumference as an indicator of central obesity, as well as the importance of consistently recording the results. In addition, cadres were taught simple techniques to educate the public about a healthy lifestyle, including recommendations for regular physical activity, a balanced diet, and efforts to prevent other risk factors such as smoking and alcohol consumption.

The presentation was conducted using an interactive lecture method and included a question-and-answer session, allowing cadres to directly clarify any unclear points. According to research by Lestari et al., (2020), interactive methods in cadre training have been proven to be more effective in improving understanding and retention of material compared to one-way lecture methods[23]. This is in line with research by Fitriyani et al., (2024) which emphasized that increasing cadre capacity through community-based health training is an effective strategy in preventing non-communicable diseases, including metabolic syndrome[24]. This activity aligns with the Adult Learning Theory perspective proposed by Knowles, who stated that posyandu cadres are adult learners who learn more effectively through applied approaches, such as direct practice, group discussions, and case simulations. This is in line with the training method provided, where cadres not only receive information passively but also actively engage in the learning process[17].

Figure 4. Presentation of Material by Expert (Internal Medicine Specialist)

d. Pre-test and Post-test Analysis

After the presentation of the material and the distribution of the modules, a post-test was conducted to assess the increase in cadre knowledge regarding metabolic syndrome. The post-test used the same instrument as the pre-test to allow objective comparison of the results. Table 2 shows the post-test results.

Table 2. Comparison of pre test and post test passing scores

Pre-test	Post-tets	Enhancement	Status pre-test	Status post-test
70	80	10	Passed	Passed
50	80	30	Failed	Passed
80	80	0	Passed	Passed
40	70	30	Failed	Passed
80	90	10	Passed	Passed
50	60	10	Failed	Passed
80	90	10	Passed	Passed
60	60	0	Passed	Passed
90	90	0	Passed	Passed
80	90	10	Passed	Passed
60	80	20	Passed	Passed
40	60	20	Failed	Passed
60	70	10	Passed	Passed
80	90	10	Passed	Passed
60	60	0	Passed	Passed

Table 2. shows that there was variation in score improvement for each respondent. In general, score improvement ranged from 0 to 30 points. The majority of respondents experienced score improvement after the intervention. Of the 15 respondents, 4 (26.67%) failed the pre-test. However, after receiving training intervention, all respondents showed improved scores, resulting in all cadres passing the post-test (100%). This finding indicates that the training was effective in improving the understanding of cadres who previously scored low.

Although some respondents with high initial scores (≥ 80) tended to experience no improvement (0 points), they remained consistently in the passing category on both the pre-test and post-test. Meanwhile, respondents with low pre-test scores showed significant improvements ranging from 20 to 30 points, contributing significantly to the increase in pass rates. This comparison is illustrated in Figure 5.

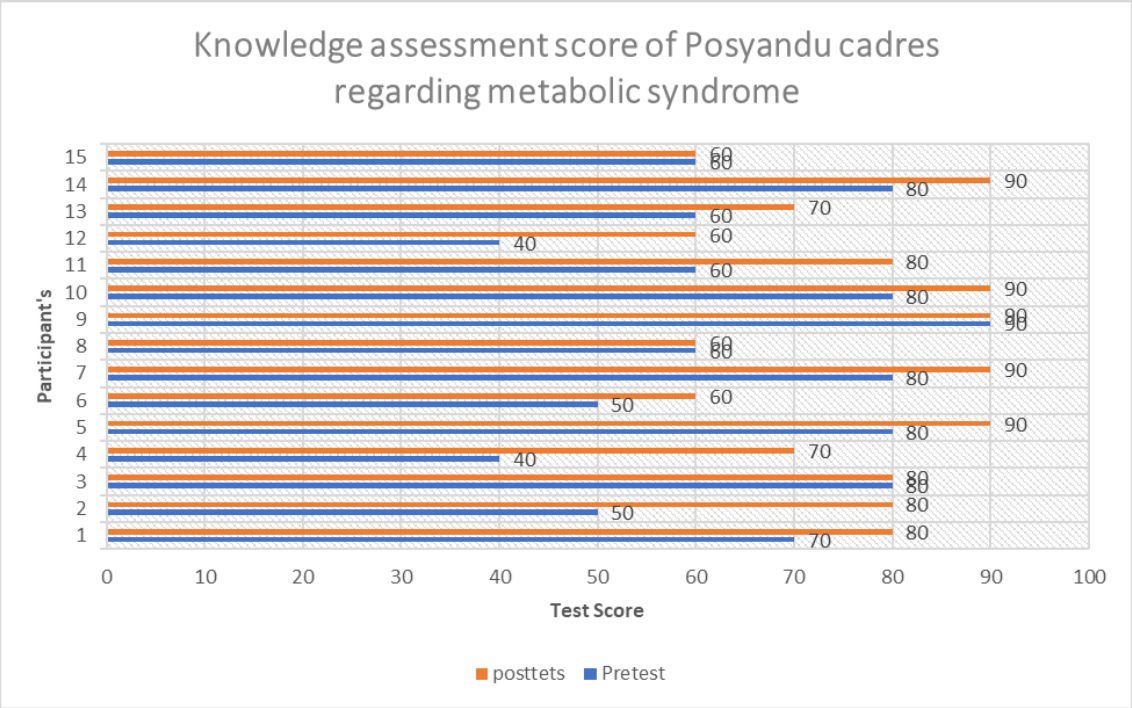

Figure 5. Knowledge assessment score of Posyandu cadres regarding metabolic syndrome.

The pass rate for the Posyandu cadre knowledge assessment regarding metabolic syndrome in the pre-test and post-test is shown in Figure 6. In the pre-test stage, 11 cadres passed and 4 cadres failed, with a pass rate of 73.33%. After the educational intervention, the post-test results showed a significant improvement, with all cadres achieving the pass category. This indicates that the training provided was able to improve the cadre's understanding evenly, even for those who had not previously achieved the pass mark.

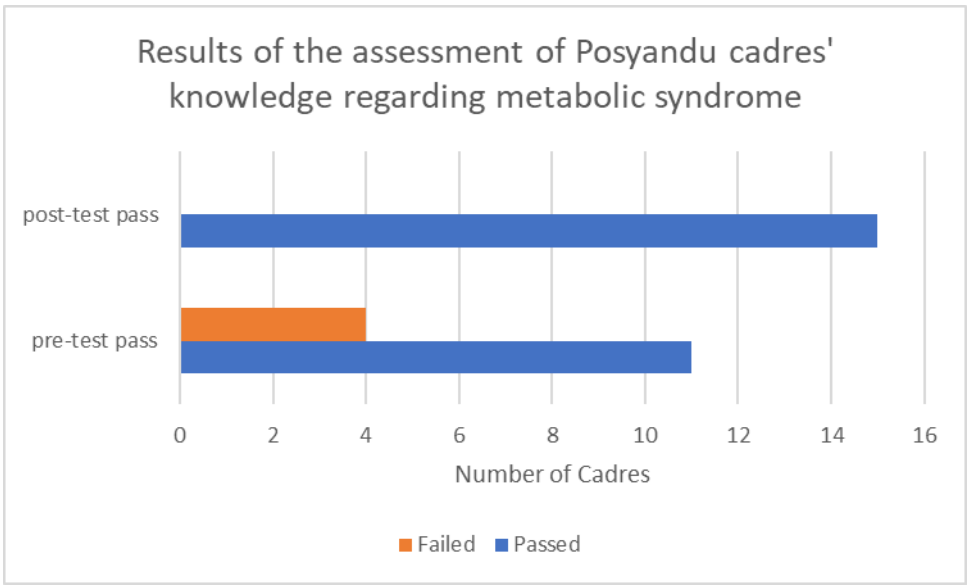

Figure 6. Comparison of pre-test and post-test passing percentages

These findings align with health education theory, which states that educational interventions can improve individual knowledge and skills, especially in groups with lower initial knowledge levels[25]. The effectiveness of these improvements aligns with the Health Belief Model (HBM) theory, which emphasizes that improving cadres' perceptions of metabolic syndrome risk (perceived susceptibility and perceived severity) plays a role in increasing motivation for early detection and screening. With a better understanding of the risk factors and impacts of metabolic syndrome, cadres are more motivated to take promotive and preventive actions in the community[19,26-29].

3. Field Assistance Activities

a. Assessment of Cadre Skills

Figure 7. Metabolic Syndrome Field Assistance

Based on observations, Posyandu cadres have demonstrated improved understanding of metabolic syndrome screening indications. They are able to carry out procedures in accordance with standard operating procedures (SOPs) and can clearly explain the indications and test results. Cadre skills evaluation was conducted using the Direct Observation of Procedural Skills (DOPS) method, which allows for direct assessment of cadres' ability to perform screening procedures and provides immediate feedback for skill improvement. However, in the educational-communication area, several cadres still require further assistance, particularly in delivering applicable and easily understood health messages to the community. The theoretical basis used in this activity is the Adult Learning Theory (Knowles), which explains that adult learning will be more effective when it is relevant to real needs, based on experience, and accompanied by direct practice in the field. Overall, the training and field mentoring phase of this community service activity has proven to be effective in improving the knowledge and skills of Posyandu cadres in providing education and early detection of metabolic syndrome[17].

b. Cadre Feedback on Training Activities

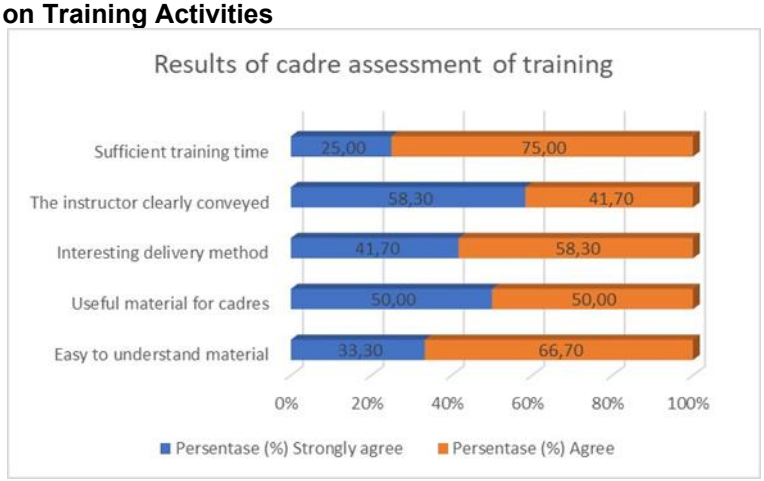

Figure 8. Cadre Feedback on Training Activities

Overall, all aspects of the training received positive feedback, with responses ranging from "Agree" to "Strongly Agree." This indicates that the modules, methods, and instructors were aligned with the cadres'

needs. However, significant feedback was received regarding the duration of the training and the need for further training. Therefore, this questionnaire evaluation confirms that the training program not only improved the cadres' knowledge and skills but was also well-received and directly beneficial by the participants.

CONCLUSION

The training of Posyandu cadres on early detection of metabolic syndrome proved effective in improving their knowledge and skills, as demonstrated by improved post-test scores and skill observation results. Cadres were able to carry out screening procedures according to standards and understood the indications and interpretation of test results well. However, the communication-education aspect still requires further guidance to ensure health messages are more applicable to the community. The results of the participant satisfaction evaluation indicated that the training was well-received and deemed relevant, although there was a need for longer duration and further training. The program's success was also demonstrated by the increase in the cadre pass rate from 73.33% in the pre-test to 100% in the post-test, thus proving that the applied training significantly contributed to strengthening the capacity of cadres as the spearhead of community-based health services. Overall, this program contributed to strengthening the capacity of cadres as the primary implementers of promotive and preventive services at the community level.

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