

# STRENGTHENING HEALTH CADRES THROUGH STRUCTURED TRAINING FOR COMMUNITY-BASED OBESITY SCREENING

Citra Maharani<sup>1</sup>, Anggelia Puspasari<sup>1</sup>, Ahmad Syauqy<sup>1</sup>, Amelia Dwi Fitri<sup>2</sup>, Nyimas Natasha Ayu Shafira<sup>2</sup>, Tengku Arief Buana Perkasa<sup>1</sup>, Debby Hasmita<sup>3</sup>

<sup>1</sup>Department of Medical Biology and Biochemistry, Faculty of Medicine and Health Sciences, Jambi University, Jambi, Indonesia

<sup>2</sup>Department of Medical Education, Faculty of Medicine and Health Sciences, Jambi University, Jambi, Indonesia

<sup>3</sup>Tahtul Yaman Community Health Center, Jambi, Indonesia

Corresponding author email: [citra\\_maharani@unja.ac.id](mailto:citra_maharani@unja.ac.id)

## ABSTRACT

Obesity is a major risk factors for non-communicable diseases, and its prevalence continues to increase in Indonesia. Community Health Centers, as primary healthcare providers, play a crucial role in obesity prevention through the empowerment of local health cadres. This community service aimed to enhance cadres' knowledge and skills in early obesity detection. The program was implemented through a structured training consisting of material delivery and hands-on anthropometric measurement sessions, followed by field visits to Posyandu to evaluate cadres' practical skills in performing anthropometric assessments. A total of 15 Posyandu cadres from the working area of Tahtul Yaman Community Health Center participated in this activity. The results showed a significant increase in knowledge, with median scores rising from 90 (range 50–100) in the pre-test to 100 (range 80–100) in the post-test ( $p = 0.007$ ). The proportion of cadres achieving the passing score also increased from 53.3% to 100% ( $p = 0.006$ ). Field observations indicated that most cadres were able to perform anthropometric examinations independently and in accordance with standard procedures. These findings suggest that structured training combined with practical field reinforcement may contribute to improving cadres' competencies, thereby supporting their role in sustainable, community-based obesity prevention efforts.

**Keywords:** Obesity screening; Health cadres; Anthropometry; Community health center

## ABSTRAK

Obesitas merupakan salah satu faktor risiko utama penyakit tidak menular, dan prevalensinya terus meningkat di Indonesia. Puskesmas sebagai penyedia layanan kesehatan primer memiliki peran penting dalam upaya pencegahan obesitas melalui pemberdayaan kader kesehatan di tingkat masyarakat. Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan pengetahuan dan keterampilan kader dalam deteksi dini obesitas. Program dilaksanakan melalui pelatihan terstruktur yang mencakup penyampaian materi dan sesi praktik pemeriksaan antropometri, dilanjutkan dengan kunjungan lapangan ke Posyandu untuk menilai keterampilan kader dalam menerapkan pemeriksaan antropometri di masyarakat. Kegiatan ini melibatkan 15 kader Posyandu di wilayah kerja Puskesmas Tahtul Yaman. Hasil evaluasi menunjukkan peningkatan pengetahuan yang signifikan, dengan nilai median meningkat dari 90 (rentang 50–100) pada pre-test menjadi 100 (rentang 80–100) pada post-test ( $p = 0,007$ ). Persentase kader yang mencapai nilai kelulusan juga meningkat dari 53,3% menjadi 100% ( $p = 0,006$ ). Hasil observasi lapangan memperlihatkan bahwa sebagian besar kader mampu melakukan pemeriksaan antropometri secara mandiri dan sesuai dengan prosedur standar. Hal ini menunjukkan bahwa pelatihan terstruktur yang disertai dengan penguatan praktik lapangan berpotensi meningkatkan kompetensi kader, sehingga dapat mendukung penguatan peran mereka dalam upaya pencegahan obesitas berbasis masyarakat secara berkelanjutan.

**Kata kunci:** Skrining obesitas; Kader kesehatan; Antropometri; Puskesmas

## INTRODUCTION

Obesity is a major risk factor for non-communicable diseases (NCDs) that contributes significantly to increased morbidity and mortality. The prevalence of obesity among adults in Indonesia has increased from 14.8% in 2013 to 21.8% in 2018.<sup>1</sup> Furthermore, the results of the 2023 Indonesia Health Survey also indicate a continuous national increase in the prevalence of obesity among the adult population. In Jambi Province, the SKI 2023 data recorded that approximately 30% of the population aged >18 years are either overweight or obese. This condition highlights the necessity for more optimal community-based promotive and preventive efforts in obesity management.<sup>2–4</sup>



The Community Health Center, as a first-level health service facility, has a strategic role in controlling NCD risk factors through community empowerment, including optimizing the role of health cadres at Posyandu services. Cadres are responsible for implementing Posyandu activities, ranging from nutrition education to the early detection of nutritional status and obesity in the community.<sup>5-7</sup> The 2024 NCD Control Program Report from the Tahtul Yaman Community Health Center in Pelayangan District, Jambi City, also shows that hypertension and diabetes mellitus are the two most common diseases in the area. Community-based screening efforts for NCD risk factors have been implemented in various regions as part of strengthening early disease detection.<sup>8</sup>

However, the implementation of obesity screening by cadres still faces several challenges. These constraints include the absence of routine cadre training, non-standardized anthropometric examination skills, and the lack of direct, competency-based evaluation in the field. This aligns with findings suggesting that cadres' skills in anthropometric measurement tend to be low if not accompanied by continuous training and adequate technical supervision.<sup>5,6,9</sup> Given these issues, a training intervention is necessary not only to improve cadres' knowledge but also to ensure that anthropometric measurement skills can be correctly applied in field practice. The use of direct field observation as a practical skill evaluation method is considered appropriate for assessing the competence of cadres in performing health examination procedures.<sup>8,10-14</sup>

## METHODS

This community service activity was conducted to improve the knowledge and skills of Posyandu cadres in the early detection of obesity through anthropometric examination. The activity took place in the working area of the Tahtul Yaman Community Health Center, Pelayangan District, Jambi City, in 2025. The participants comprised 15 active Posyandu cadres representing several Posyandu within the Community Health Center's working area. Implementation began with coordination with the Community Health Center, followed by the preparation of materials, modules, evaluation instruments (pre and post-test), and the plan for skills assessment using field observation.

### Stage 1: Cadre Training

The first stage consisted of structured training sessions designed to improve cadres' knowledge and skills in obesity screening. The training included a pre-test to assess baseline knowledge, material presentation and discussion on obesity and anthropometric measurement techniques, hands-on practice in small groups, and a post-test to evaluate learning outcomes. Following the pre-test, each cadre was provided with a learning module entitled "Kader Tangkas, Cegah Obesitas" as a reference to support independent study and to facilitate understanding of the training materials. During the practical sessions, cadres were guided to measure body weight, height, and waist circumference, calculate Body Mass Index (BMI), and interpret nutritional and central obesity status.

The pre-post test data were analyzed statistically to assess the increase in knowledge scores before and after the training. The Wilcoxon Signed Rank Test was used to analyze the difference in pre-post test scores due to the non-parametric distribution of the data, with a significance level of  $p < 0.05$ .

### Stage 2: Field Visit and Skill Evaluation

Following the training, the second stage was conducted one month later through field visits to Posyandu within the working area of the Tahtul Yaman Community Health Center. These visits aimed to assess the cadres' ability to apply the skills learned during training in real community settings. The evaluation was performed through direct field observation by facilitators, who monitored the cadres as they conducted anthropometric examinations on community members.

The assessment covered several competency aspects, including preparation and anthropometric examination techniques, as well as communication and interaction with the community in conveying results and delivering educational messages related to obesity prevention. A cadre was deemed competent (capable) if they successfully performed all critical steps across these aspects. Verbal feedback was provided immediately after the assessment to reinforce areas of good performance and correct parts requiring improvement.

## RESULTS AND DISCUSSION

The implementation of this community service activity focused on enhancing the capacity of Posyandu cadres as the frontline for early obesity detection in primary care. Evaluation results demonstrated a significant improvement among cadres after participating in the training, as shown in **Table 1**. The median post-test score (100; range 80–100) increased significantly compared to the median pre-test score (90; range 50–100), with  $p = 0.007$ . This knowledge increase was supported by the cadres' passing percentage, which rose from 53.3% in the pre-test to 100% in the post-test ( $p = 0.006$ ), as shown in **Table 2**. The training structure further incorporated demonstration, supervised hands-on practice, paired peer-practice, and the use of job-aids



methods recommended in World Health Organization (WHO) anthropometric training materials and Community Health Worker curricula to enhance procedural retention.<sup>13,15</sup>

**Table 1.** Pre-test and Post-test Scores

Activity	Score (n=15)	p-value
Pre-test	90 (50-100)	<b>0.007*</b>
Post-test	100 (80-100)	

\*Data were non-normally distributed, hence presented in median (range) and analyzed using the Wilcoxon test. The level of significance used is  $p < 0.05$ .

**Table 2.** Number of Participants Passing and Failing the Pre-test and Post-test

Activity	Passing Participants (n)	Failing Participants (n)	p-value
Pre-test	8	7	<b>0.006*</b>
Post-test	15	0	

\*Analysis using Fisher's exact test with a significance level of  $p < 0.05$

A follow-up field visit was conducted one month after the training to observe cadres' performance in actual community settings. During these visits, the cadres applied the skills acquired during training by performing complete anthropometric assessments and interpreting the findings to determine both general and central obesity categories. This direct observation method was aligned with established workplace-based assessment frameworks, particularly the Direct Observation of Procedural Skills, which emphasized real-time feedback to reinforce procedural learning and improve practical competence.<sup>16</sup> Observation showed that most cadres were capable of performing anthropometric examinations independently and in accordance with the established standard procedures. These findings suggest that the combination of structured training and supervised field practice contributed positively to both the understanding and practical skill performance of the cadres.<sup>14</sup>



**Figure 1.** Cadre training activity

The significant increase in knowledge reflects the effectiveness of the learning method applied in the training. This approach aligns with the principles of adult learning (andragogy) which emphasize the relevance of the material to the participants' practical needs and active participation.<sup>17</sup> Adequate knowledge regarding the definition, risk factors, and methods of obesity screening is a crucial foundation before cadres can fulfill their role as health promotion and screening agents.

The transfer of cadres' procedural skills was evaluated using field observation. This direct and practical evaluation approach ensures that the evaluation is not only cognitive (knowledge) but also objective regarding



the cadres' technical and non-technical competencies, consistent with best practice in procedural skill assessment.<sup>16,18</sup> Evidence from community settings indicates that even short, structured training can substantially improve the accuracy of anthropometric measurements among community health workers.<sup>19</sup>

The cadres' mastery of anthropometric techniques holds important implications for community-based health screening. While BMI remains a standard indicator for obesity classification, waist circumference serves as a more sensitive marker for central obesity, which is closely associated with metabolic and cardiovascular risks.<sup>20,21</sup> Correct technique and consistent tape placement are necessary for reliable screening results; therefore, standardized training and operating procedures are essential for cadre-level screening.<sup>15,22–24</sup>



**Figure 2.** Field observation for cadre procedural skill evaluation

This activity also supports the principle of task shifting, where selected procedural responsibilities are delegated from professional to non-professional health workers, such as community cadres. In the context of limited health workforce capacity and the growing burden of non-communicable diseases, trained cadres play an important complementary role in extending preventive and screening services at the community level.<sup>18,25–27</sup> Through this approach, basic anthropometric screening can be performed more widely, while professional healthcare staff can focus on more complex clinical management.<sup>27</sup> However, global evidence suggests that training alone is rarely sufficient for sustained quality; continuous supervision, refresher training, adequate resources, and recognition systems significantly enhance long-term performance.<sup>13,15,23</sup>

To ensure the sustainability and implementation of the program, this activity was supplemented with the provision of simple anthropometric tools, such as weighing scales, microtoise, and measuring tapes that comply with standards. The availability of these instruments enables cadres to directly apply their newly acquired skills during routine Posyandu activities. In addition, recognition was given to the best-performing cadres as part of a motivational strategy. Such recognition has been shown to enhance intrinsic motivation and self-efficacy, which are key determinants of long-term participation and program continuity.<sup>17</sup> In summary, this cadre training and field reinforcement model shows potential as a practical strategy for strengthening community-based obesity prevention efforts, provided that ongoing supervision and periodic evaluations are maintained to ensure performance consistency over time.

## CONCLUSION

Training health cadres through a combination of theoretical and practical sessions effectively improved their knowledge and skills in obesity detection. The cadres were able to independently perform standardized anthropometric measurements within the community. Evaluation through field observation ensured

standardized competencies, thereby strengthening the role of cadres in obesity screening and supporting sustainable community-based NCD prevention and control efforts.

## ACKNOWLEDGEMENTS

The authors would like to thank the Tahtul Yaman Community Health Center team, especially the head of Community Health Center and the Posyandu cadres, for their active participation and support in this activity. This research was funded by the Directorate of Research and Community Service, Universitas Jambi.

## REFERENCES

1. Centre for Research and Development of Health Resources and Services Republic Indonesia. *Riset Kesehatan Dasar (RISKESDAS)*. Ministry of Health Republic Indonesia; 2018.
2. Ministry of Health Republic Indonesia. *Survey Kesehatan Indonesia 2023*. Ministry of Health Republic Indonesia; 2024. Accessed November 14, 2025. <https://www.badankebijakan.kemkes.go.id/laporan-tematik-ski/>
3. Priskila L, Perkasa TAB, Wijaya YOS. Kajian Manfaat Diet Mediterania. *Cermin Dunia Kedokteran*. 2024;51(11):653-660. doi:10.55175/cdk.v51i11.1265
4. Ayudia EI, Calista AA, Enis RN, Perkasa TAB, Anggaraini B, Asyhar R. A Comparison Between The 5:2 And 16:8 Intermittent Fasting Methods on Weight Loss in Overweight And Obese Individuals. *Jambi Medical Journal: Jurnal Kedokteran Dan Kesehatan*. 2025;13(1):91-97.
5. Qodir A, Soelistyoningsih D, Daramatasia W, Wahyuningrum AD, Rachmadhani R, Yulianti SD. Empowerment Posyandu cadres in the transfer of spinach-based technology for early stunting prevention. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*. 2024;9(1):1-11. doi:10.26905/abdimas.v9i1.11898
6. Antarsih NR, Yantina D, Aticeh A. Empowering Health Cadres as a Toddler Posyandu Team to Improve the Knowledge and Skills of Cadres Through Counseling by Screening Toddlers so That Cadres and Families can Detect early and Refer to Stunting Cases That Have Increased During the COVID-19 Pan. *Engagement: Jurnal Pengabdian Kepada Masyarakat*. 2021;5(2):283-296. doi:10.29062/engagement.v5i2.667
7. Ministry of Health Republic Indonesia. *Posyandu Reading Book Series*. Directorate of Health Promotion and Community Empowerment Republic Indonesia; 2021. Accessed November 14, 2025. [https://ayosehat.kemkes.go.id/pub/files/files59223Final\\_BUKU%20BACAAN%20SERIAL%20POSYANDU\\_20%20Des%202021.pdf](https://ayosehat.kemkes.go.id/pub/files/files59223Final_BUKU%20BACAAN%20SERIAL%20POSYANDU_20%20Des%202021.pdf)
8. Maharani C, Shafira NNA, Puspasari A, Enis RN, Iskandar MM. Community Screening of Stroke Risk Factors Among Productive Age Population. *Medical Dedication (MEDIC)*. 2025;8(1):52-56. Accessed September 15, 2025. <https://online-journal.unja.ac.id/medic/article/view/37999>
9. Mintarsih SN, Ambarwati R, Ismawanti Z, Sunarto S, Mardiana M, Wijayanti AA. Enhancing anthropometric skills and nutrition counseling through mentoring for adolescent Posbindu cadres. *Action: Aceh Nutrition Journal*. 2025;10(2):324. doi:10.30867/action.v10i2.2408
10. Ayudia EI, Amatullah A, Perkasa TAB, Asty ZF, Wijayanti Z. Strategi Inovatif Peningkatan Kesadaran Tentang Diabetes Melitus: Mengurangi Risiko Melalui Edukasi dan Screening di Masyarakat. *Medical Dedication (MEDIC)*. 2024;7(2):92-98. Accessed September 15, 2025. <https://online-journal.unja.ac.id/medic/article/view/38012>
11. Ekaputri TW, Enis RN, Tarawifa S, Harahap H, Syaury A, Perkasa TAB. Optimizing Maternal and Child Health: Enhancing Public Awareness of TORCH Infections During Pregnancy. *Medical Dedication (MEDIC)*. 2025;8(1):20-25. Accessed September 15, 2025. <https://online-journal.unja.ac.id/medic/article/view/42999>
12. Cameron NA, Kushner RF. Development of a telehealth obesity OSCE and reliable checklist for assessment of resident physicians: A pilot study. Preprint posted online February 24, 2022. doi:10.21203/rs.3.rs-1043048/v1
13. Adams LB, Richmond J, Watson SN, et al. Community Health Worker Training Curricula and Intervention Outcomes in African American and Latinx Communities: A Systematic Review. *Health Education & Behavior*. 2021;48(4):516-531. doi:10.1177/1090198120959326
14. Abdel-All M, Putica B, Praveen D, Abimbola S, Joshi R. Effectiveness of community health worker training programmes for cardiovascular disease management in low-income and middle-income countries: a systematic review. *BMJ Open*. 2017;7(11):e015529. doi:10.1136/bmjopen-2016-015529
15. World Health Organization. Obesity and Overweight Fact Sheet. World Health Organization. 2022. Accessed September 15, 2025. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
16. Erfani Khanghahi M, Ebadi Fard Azar F. Direct observation of procedural skills (DOPS) evaluation method: Systematic review of evidence. *Med J Islam Repub Iran*. 2018;32(1):254-261. doi:10.14196/mjiri.32.45
17. Knowles MS, Holton III EF, Swanson RA. *The Adult Learner*. Routledge; 2014. doi:10.4324/9781315816951
18. Prakash J, Chatterjee K, Srivastava K, Chauhan VS, Sharma R. Workplace based assessment: A review of available tools and their relevance. *Ind Psychiatry J*. 2020;29(2):200-204. doi:10.4103/ipj.ipj\_225\_20
19. Suyatno S, Kartasurya MI, Susanto HS. Tiered Training Model to Improve the Skills of Posyandu Cadres in Measuring Child Anthropometry in Demak Regency, Indonesia. *Amerta Nutrition*. 2024;8(1SP):9-18. doi:10.20473/amnt.v8i1SP.2024.9-18
20. Huai P, Liu J, Ye X, Li WQ. Association of Central Obesity With All Cause and Cause-Specific Mortality in US Adults: A Prospective Cohort Study. *Front Cardiovasc Med*. 2022;9. doi:10.3389/fcvm.2022.816144



21. Mus R, Sadewa AH, Hastuti P, Puspasari A, Maharani C, Setyawati I. Risk factor of metabolic syndrome in Javanese population based on determinants of anthropometry and metabolic measurement. *Journal of the Medical Sciences (Berkala Ilmu Kedokteran)*. 2021;53(3). doi:10.19106/JMedSci005302202105
22. Ross R, Neeland IJ, Yamashita S, et al. Waist circumference as a vital sign in clinical practice: a Consensus Statement from the IAS and ICCR Working Group on Visceral Obesity. *Nat Rev Endocrinol*. 2020;16(3):177-189. doi:10.1038/s41574-019-0310-7
23. World Health Organization. Cardiovascular diseases (CVDs). World Health Organization. 2021. Accessed October 31, 2025. [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
24. Centers for Disease Control and Prevention (CDC). *Waist Circumference Measurement Methodology (NHANES)*. National Center for Health Statistics United States of America; 2017.
25. Joshi R, Alim M, Kengne AP, et al. Task Shifting for Non-Communicable Disease Management in Low and Middle Income Countries – A Systematic Review. *PLoS One*. 2014;9(8):e103754. doi:10.1371/journal.pone.0103754
26. Sari IWWS, Rukmi DK, Yulaikhah L. Penguatan Peran Kader Kesehatan dalam Meningkatkan Kesejahteraan Spiritual pada Penderita Diabetes Melitus di Wilayah Kerja Puskesmas Pandak 1. *Jurnal Peduli Masyarakat*. 2024;111(118):6-1. doi:<https://doi.org/10.37287/jpm.v6i1.2569>
27. Leong SL, Teoh SL, Fun WH, Lee SWH. Task shifting in primary care to tackle healthcare worker shortages: An umbrella review. *European Journal of General Practice*. 2021;27(1):198-210. doi:10.1080/13814788.2021.1954616

