AgriHealth
Journal of Agri-food, Nutrition and Public Health
ISSN 2722-0656 (Print) 2722-0648 (Online)

AgriHealth: Journal of Agri-food, Nutrition and Public Health. 5(1), 54-62, 2024
URL: https://jurnal.uns.ac.id/agrihealth/article/view/84079
DOI: http://dx.doi.org/10.20961/agrihealth.v5i1.84079

Implementation of Integrated Health Service and Promotion Posts for Non-Communicable Diseases (NCDs) to Improve Knowledge, Anthropometric and Nutritional Counseling Skills of Adolescent Cadres in Schools

Sri Noor Mintarsih[1*], Susi Tursilowati[1], Ria Ambarwati[1], Mardiana[2] and Zuhria Ismawanti[1]

[1]Department of Nutrition, Poltekkes Kemenkes Semarang, Semarang, Indonesia; [2]Department of Nutrition, Faculty of Medicine, Universitas Negeri Semarang, Semarang, Indonesia

Received: January 29, 2024; **Accepted**: March 7, 2024

Abstract

Non-communicable diseases (NCDs) risk factors include changes in the lifestyle of adolescents with unhealthy diets tend to fast food, lack of activity and exercise, increased stressors, and exposure to environmental conditions that are not conducive to health. Establishing NCDs Integrated Health Service and Promotion Post is an efficient and effective control strategy aiming at early detection of NCDs risk factors. Empowerment of peer counsellors as Integrated Development Post cadres is expected to become agents of change and detect NCDs risk factors in schools. This research determines the effectiveness of implementing an adolescent-Integrated Development Post in schools to increase the adolescent cadre's knowledge, anthropometric skills, and nutritional counseling. It is an experimental design with one group pre-post test at one of the high schools in Semarang City. Integrated Development Post cadres are peer counselors selected according to the criteria of 10% of the total number of students (36 people) from 11th grade. Differences in knowledge scores, anthropometric skills, and nutritional counseling of cadres were analyzed using the Paired T-test. The cadre's knowledge scores increased from 50.55 to 70.11; anthropometric skills include weighing from 61.67 to 98.98, measuring height from 54.63 to 94.25, and nutritional counseling from 72.92 to 86.71. Paired T-test results show a *p*-value < 0.05. Integrated Development Post effectively increases cadre's knowledge scores, anthropometric skills, and nutritional counseling. It can also detect risk factors to prevent and control NCDs in the school.

Keywords: adolescent cadres; eating behavior; malnutrition; nutrition knowledge and skills; teenagers

INTRODUCTION

Health problems in adolescence are not limited to malnutrition and infectious diseases but are also related to overnutrition and non-communicable diseases (NCDs) (Desalegn et al., 2023). The increase in NCDs is related to changes in lifestyle due to globalization, urbanization, modernization, and population growth. Lifestyle changes will lead to NCDs risk factors described by Basic Health Research (*Riset Kesehatan Dasar*/ Riskesdas) 2018, in the age group of 15 to 24 years, the prevalence of NCDs diseases such as cancer prevalence of 1.8%, diabetes mellitus at 8.5%, stroke at 10.9% and hypertension at 34.1%. It shows that NCDs cases have appeared in the young age group. Risk factors for NCDs in the adolescent group are characterized by the prevalence of adolescents who smoke (10 to 18 years) increasing from 8.8 to 9.1%; the proportion

* **Corresponding author**: srinoormintarsih@gmail.com

Cite this as: Mintarsih, S. N., Tursilowati, S., Ambarwati, R., Mardiana, & Ismawanti, Z. (2024). Implementation of Integrated Health Service and Promotion Posts for Non-Communicable Diseases (NCDs) to Improve Knowledge, Anthropometric and Nutritional Counseling Skills of Adolescent Cadres in Schools. *AgriHealth: Journal of Agri-food, Nutrition and Public Health*, *5*(1), 54-62. doi: http://dx.doi.org/10.20961/agrihealth.v5i1.84079

of alcoholic beverage consumption increased from 3 to 3.3%, as well as 0.8% who consume drinks that contain excessive alcohol. Lack of vegetables and fruit consumption in the population ≥ 5 years old amounted to 95.5% (Ministry of Health, 2018).

Adolescent diets tend towards fast food with various modern options as part of the lifestyle. When social distancing is implemented, it can affect people's eating habits, including teenagers. They turn to online delivery services to get the food they want without physically interacting with many people. It supports high levels of sedentary behavior. Unhealthy lifestyles and eating habits are an option among school adolescents who prefer modern foods high in fat but low in fiber while neglecting consuming fruits and vegetables (Andayasari and Opitasari, 2020; Raptou, 2021). Risk factors for NCDs include lack of physical activity, increased stress, and environmental conditions that do not support health. Prevention of NCD is carried out by encouraging healthy lifestyles, implementing health protocols, recognizing NCDs risk factors early, and including the health and education sectors in promotion to raise awareness among teenagers (Pranandari et al., 2017; Befus et al., 2024).

NCDs Integrated Development Post is an efficient and effective NCDs control strategy by empowering and optimizing the community's role in monitoring and early detection of NCDs risk factors in the community (Mintarsih et al., 2022). The target of the activity is individuals aged ≥ 15 years. The implementation is on school days when teenagers (Junior and Senior High School students) are doing school activities. Thus, it can minimize the total number of community visits until the level of community participation decreases. Establishing school-based Integrated Development Posts with peer counselors as cadre's is an alternative to enhance adolescent involvement (Suranata, 2013).

Many adolescents discuss their problems with peers rather than parents or teachers. They seek out friends who are willing to listen and assist in overcoming their problems, following the principle of learning by doing. Peer counselors are expected to act as agents of change in the school environment, family, and society. Through the empowerment of peer counselors trained as Integrated Development Post cadres, it is hoped that they will conduct NCDs risk factor detection in schools (Mahdur et al., 2020).

One of the Semarang's high schools was chosen because a prior study had shown multiple NCD risk variables and had trained peer counselors and teenagers in early detection. They are expected to act as cadres of the Integrated Development Post who will carry out early detection of NCD risk factors in their peers in the school environment (Mintarsih et al., 2022).

Referring to this explanation, the researcher was interested in investigating the implementation of NCDs Integrated Development Post in schools through empowering peer counselors as cadres. Peer counselors can implement their knowledge and skills in Integrated Development Post activities. It is expected to be an alternative early detection model related to NCDs risk factors based on Integrated Development Post in the school environment. Through this description, the researcher investigated the effectiveness of implementing NCDs Integrated Development Post on adolescents in schools.

MATERIALS AND METHOD

This type of research is quasi-experimental with one group pre-post-test design. The study was conducted at one Senior High School in Semarang City. The target of the Integrated Development Post was the 10th-grade students who were recorded as active in the 2023/2024 school year and were 337 people. Peer counselors as Integrated Development Post cadres came from 11th-grade students, with as much as 10% of the total number of students (36 people) selected according to the criteria of being interested, having empathy for friends, and liking to organize. Data collection through:

1. The Integrated Development Post that conducts cadre training and has some material on NCDs.
2. The skills provided support the duties as cadres on the 5 Integrated Development Post activity tables, namely skills in registration, interviewing, nutritional anthropometry, using auto check and tensimeter, and conducting nutritional education and counseling to friends. The methods used were lectures, discussions, and practices.
3. Establish an integrated development post with cadres trained by as many as 36 peer counselors who have received training.
4. Implementation of Integrated Development Post school, the target is asked to fill in

personal identity, history of NCDs (family and self), NCDs risk factors (fruit vegetable consumption behavior, consumption of sugar, salt and oil, smoking, exercise habits and consumption of alcoholic beverages) using a checklist form using the NCDs risk factor monitoring book.

5. Measurement of body weight and height was done by cadres, while sugar level was checked by health workers. Cadres conduct nutrition and health counseling as a follow-up to the examination results. The last table records the entire series of activities, while data is input on the Healthy Indonesia Application by the Public Health Center. A post-test of cadre skills was conducted during Integrated Development Post activities with a target of 3 participants.
6. Analysis of risk factors for Integrated Development Post target behavior includes the habit of consuming fewer vegetables and fruit < 5 servings a day, consumption of sweet foods > 2 servings a day, consumption of salty foods > 5 times a day, and consumption of fatty foods > 5 servings a day, lack of physical activity 150 minutes per week, consuming alcoholic beverages and smoking habits. Each risk factor is categorized as risky or not risky based on behavioral risk factors referring to the NCDS risk factor assessment criteria.
7. Physical factors were categorized as risky if body mass index (BMI) > 25, blood pressure > 140/90 mmHg, and blood sugar level > 200 mg dl^{-1}. If the BMI, blood pressure, and blood sugar levels are below these limits, they are categorized as not at risk.
8. Determination of the magnitude of the NCDS problem is based on the proportion of each indicator with the following cut of points: lack of vegetables and fruits, consumption of sweet foods, consumption of salty foods and consumption of excessive fatty foods each > 50%, consumption of drinking alcohol > 20%, smoking habits > 30%, lack of physical activity and exercise > 20%, BMI ≥ 23 by > 20%, blood pressure (systolic) > 20%, and blood glucose (systolic) > 20%, blood pressure (systole ≥ 140 mmHg, diastole ≥ 90 mmHg) and blood sugar level > 200 mg dl^{-1}.

The cadre data collected were knowledge and skill scores of cadre about NCDs, the Integrated Development Post program, balanced nutrition and nutrition counseling techniques, cadre skills in anthropometry (weight weighing and height measurement), and nutrition counseling. Knowledge was measured by questionnaire and scores were calculated based on correct answers. Cadre skills were calculated according to the percentage of performance of cadres when carrying out weight-weighing activities, measuring height, and using techniques for conducting nutrition and health counseling.

The data analysis used in this study was carried out in two stages: the effectiveness of the implementation of the Integrated Development Post was reviewed through efforts to improve pre-test and post-test scores of cadre knowledge and skills. The effectiveness of the analysis was assessed using the Paired T-test because the data is normally distributed. The Health Research Ethics Commission of the Poltekkes Kemenkes Semarang approved the study protocol with the number 0855/EA/KEPK/2023.

RESULTS AND DISCUSSION

The target group of Integrated Development Post was the 10th-grade students of Senior High School in Semarang City, 337 individuals, consisting of 172 males (51.04%) and 165 females (48.96%), and most of them were 15 years old, 244 (72.40%). Based on guidelines, the targets of the Integrated Development Post in this school are the community (men and women) aged 15 years and over.

Table 1 shows that adolescents in school have behavioral factors that increase the risk of NCDs, with a percentage of 80.71% who consume sweet foods excessively (> 50%), 75.96% who consume salty foods excessively (> 50%), and 63.31% who have physical inactivity (> 20%). Every year, there is an increasing trend in the prevalence of NCDs, which pose a threat to various age groups, ranging from children to older people. NCDs have multiple triggers that can be divided into behavioral and hereditary factors. Behavioral factors include low consumption of vegetables and fruits, excessive dietary habits such as excessive salt, sweets, and fatty foods, smoking, alcohol consumption, and lack of physical activity (Gelibo et al., 2017; Firmansyah et al., 2021). Therefore, the behavioral factors of adolescents at school include excessive consumption of sweet and salty foods and lack of physical activity, which are possible risk factors for NCDs.

Table 1. Distribution of NCDs risk behavioral factors

NCDs risk behavioral factors	Number (n)	Percentage (%)
Not eating enough fruits and vegetables		
Yes	76	22.6
No	261	77.4
Excessive consumption of sweets		
Yes	272	80.71*
No	65	19.29
Excessive consumption of salty foods		
Yes	256	75.96*
No	81	24.04
Consumption of fatty foods		
Yes	161	47.77
No	176	52.23
Alcohol consumption		
Yes	0	0.00
No	337	100.00
Smoking habit		
Yes	17	5.04
No	320	94.96
Lack of physical activity/exercise		
Yes	210	63.31*
No	127	37.69

Note: * = risk factor

During adolescence, lifestyle changes influence diet. During this period, adolescents often choose foods high in fat, sodium, sugar, and caffeine and low in fiber, even though foods and beverages with such characteristics may increase the risk of NCDs (Febrianti and Prabawati, 2017).

Table 2 shows that some of the Integrated Development Post targets stated that their family or parents have a history of NCDs, including diabetes mellitus, heart disease, hypertension, cancer, and stroke. Patients may have never had their health checked, so they don't know whether or not they have a disease. The examination is carried out by conducting early detection of NCDs risk factors carried out by Integrated Development Post cadres together with public health center employees from the public health center so that blood pressure, nutritional status, and sugar levels are known in all targets (Huriyati et al., 2019).

Table 3 shows the physical and blood examination results of Integrated Development Post targets. It can be seen that the NCDs problems based on the cut of point are from the proportion of obesity > 20%, high blood pressure > 25%, and hyperglycemia > 6.5%. Table 3 shows that the NCDs problems that appear in the high school youth group are the proportion of obesity (BMI ≥ 23), namely overweight 10.38% and obesity 21.67%, pre-hypertension 5.94%, hypertension 2.37%, and moderate and high glucose levels as much as 9.50% and 0.3%, respectively. Overweight or obesity is when an individual's weight exceeds their normal or

Table 2. Distribution of various NCDs respondent's family history

NCDs history	Number (n)	Percentage (%)
Diabetes mellitus		
Yes	50	14.84
No	287	85.16
Hypertension		
Yes	39	11.57
No	298	88.43
Heart disease		
Yes	20	5.93
No	317	94.07
Cancer		
Yes	4	1.19
No	333	98.81
Stroke		
Yes	9	2.67
No	328	97.33

ideal body weight. Determining obesity is by measuring the BMI. In Indonesia, a person is considered obese if their BMI is ≥ 30 kg m^{-2}, while being called overweight if the BMI is in the range of ≥ 23 to < 30 kg m^{-2}. Both conditions increase the risk of various types of NCDs (Indarjo et al., 2019; Miller et al., 2023). Obese people will harm metabolic parameters such as blood pressure, triglycerides, cholesterol, and insulin resistance. The risk of suffering from coronary heart disease, ischemic stroke, and type 2 diabetes mellitus continues to increase as BMI increases (Kiting et al., 2016).

The increase shows the effectiveness of the training in the cadre's knowledge and skills scores from the pre-test and post-test scores. Table 4 shows an average cadre knowledge score increase of 19.56 (from 50.55 to 70.11) after implementing the Integrated Development Post. Cadre training is guided by a program that provides information and new skills. With training, cadres are expected to understand their responsibilities and tasks. Able to develop individual knowledge, skills, beliefs, and capabilities to carry out work according to their duties and responsibilities (Lestari et al., 2020).

Unknown knowledge includes nutrition as a risk factor for NCDs, plate contents, healthy snack selection, and activity frequency (Mintarsih et al., 2022). It can be concluded that cadre's knowledge still needs to be improved through regular coaching from the Public Health Center and related agencies (Meidiana et al., 2018).

Table 3. Distribution of physical examination results

Inspection result	Number (n)	Percentage (%)
BMI		
Normal	229	67.95
Less	0	0.00
Overweight	35	10.38*
Obesity	73	21.67*
Blood pressure		
Normal	309	91.69
Pre-hypertension	20	5.94*
Hypertension	8	2.37*
Blood glucose levels		
Normal	305	90.50
Medium	31	9.20*
High	1	0.30*

Table 5 shows an increase in the average score of cadre skills after implementing the Integrated Development Post, which includes weighing body weight, measuring height, and providing nutrition counseling. The skills that cadres still do not understand are the importance of measuring instruments, the position of the subject when measured, and accessories that must be removed, as well as the need to convey the problem of client, the recommendation to make a re-visit and orderly recording of nutrition counseling data (Mahdur et al., 2020). Cadres were considered skilled enough when weighing and measuring height and conducting nutrition counseling for Integrated Development Post participants. They feel that they can help and have the skills to participate in maintaining and optimizing the health of peers in their school environment (Mahdur et al., 2020).

Adolescents are more open to discussing their problems with their peers than teachers or parents. They will look for friends who are willing to listen and help solve issues with learning by doing Communication, Information, and Education (CIE). So, it is more appropriate to empower peer counselors as Integrated Development Post cadres. Thus, the counselor can be an agent of change for his friends, family, and community (Hidayani et al., 2020). In Integrated Development Post activities, peer counselors are expected to be able to detect NCDs risk factors of their friends at school.

Statistical tests with a value of $p < 0.05$ showed that training and implementation of Integrated Development Post were proven to improve cadre's skills in weighing ($p = 0.000$), measuring height ($p = 0.003$), and providing nutritional counseling ($p = 005$). Figure 1 shows the average score of pre- and post-tests covering the increase in knowledge and skills of cadres, which can be seen in performing anthropometric measurements in weighing body weight, measuring height, and providing nutritional counseling.

Training programs influence not only the improvement of knowledge but also skills. The results showed increased cadre skills in implementing Integrated Development Post ($p < 0.05$). There was an increase in skills of 37.31 when weighing, 39.62 in measuring height, and 13.79 in providing nutrition counseling.

Integrated Development Post activities are carried out by the agreement with the local Public Health Center every 6 months in March and September. Integrated Development Post in September coincides with health screening activities for new 10th-grade students in as many as 10 classes with a target of 337 people. Integrated Development Post activities at the school have not been able to serve all students from 3 batches. The solution agreed upon with the Public Health Center is to do an Integrated Development Post in rotation. Integrated Development Post in March is the 11th-grade or 12th-grade students determined by the school. Integrated Development Post school is a form of development of the institutional Integrated Development Post program, but it cannot be implemented every month. The sustainability of the Integrated Development Post still needs to be studied and evaluated further to see whether the success of a program can be achieved (Rohmayanti et al., 2021).

The implementation of the Integrated Development Post has been running according to the Technical Guidelines issued by the Directorate General of Disease Control and Environmental Health of the Indonesian Ministry of Health (Nisa et al., 2022). Cadres conduct Integrated Development Post activities according to the flow from Table 1 to 5. They carry out activities at the registration desk, interviews, anthropometric measurements (weighing body weight and measuring height), and blood pressure measurements. Health workers carry out blood sugar level checks. Furthermore, cadres provide nutrition and health counseling. Table 5 is the recording and reporting of all measurement and examination results. Data of height and body weight input on the application Sehat Indonesiaku is done by health center staff. Cadres have performed their duties according to the main tasks in the Integrated Development Post technical guidelines.

Supporting factors in implementing the NCDs Integrated Development Post program are integrated with health screening activities for grade 10. The availability of Integrated Development Post kits, leaflets and guidebooks, trained cadres, the readiness of health workers, and support from the head of the Public Health Center and the school helped the program run smoothly. The support from the Semarang City Government in the form of the *Gendis Larang* program is very useful. This program is an early detection movement of free blood sugar checks aimed at improving the prevention and control NCDs, including hypertension and diabetes mellitus in the community in adolescents in the school environment.

While the inhibiting factor is the cadres trained with a one-year duty period, it needs refreshing and retraining for new cadres (Fathonah, 2021). To improve the quality of services, cooperation with the Public Health Center and assistance from related institutions, in this case, health education institutions, are needed.

The results of the statistical testing of differences in knowledge scores before and after training obtained a value of $p = 0.000$, so there was a significant difference before and after Integrated Development Post activities. It means that cadre's knowledge increased after receiving training and practicing. It can be concluded that the Integrated Development Post is considered adequate with an increase in cadre knowledge scores. The existence of increased knowledge is

Table 4. Results of cadre knowledge score analysis

Variables	Average		Difference	*p*-value
	Pre-test	Post-test		
Knowledge score	50.55	70.11	19.56	0.000*

Note: *Significance ($p < 0.05$)

Table 5. Results of cadre skill score analysis

Skills	Average		Difference	*p*-value
	Pre-test	Post-test		
Weighing body weight	61.67	98.98	37.31	0.000*
Measuring height	54.63	94.25	39.62	0.003*
Nutrition counseling	72.92	86.71	13.70	0.005*

Note: *Significance ($p < 0.05$)

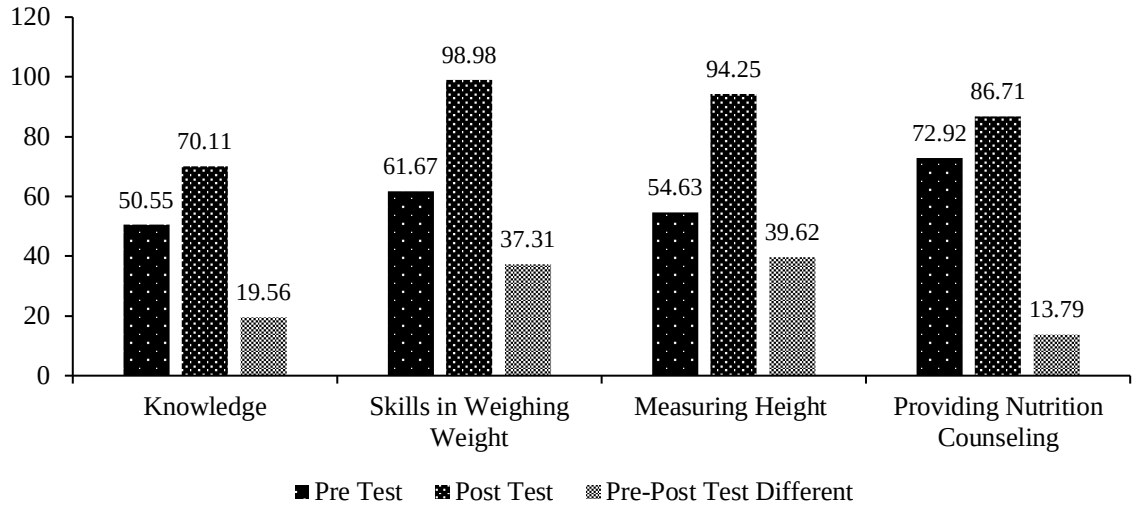

Figure 1. Mean pre-post test scores of knowledge, skills in weighing weight, measuring height, and providing nutrition counseling

also supported by the cadre's statement that their understanding has increased after implementing activities. Another supporting study is the results of previous research that training activities significantly influence the increase in knowledge of cadres as training participants, which shows a significant difference from the pre- and post-test (p = 0.003), which means that the training provided can increase cadre knowledge (Hanifah et al., 2022).

Integrated Development Post is a form of implementation of theoretical material and practical skills that are delivered during cadre training. By practicing directly on the target, cadres feel their skills increase in anthropometric and blood pressure measurements. Skills are needed by someone to carry out their work so that mistakes do not occur. Health worker support and guidance to cadres will make them more confident. Cadres need to get assistance in practicing their knowledge and skills in the implementation of Integrated Development Post and need to get refreshers related to training in previous studies also prove that there is an increase in the skills of adolescent cadres in implementing 5 NCDs Integrated Development Post tables (Hastuti et al., 2019).

Integrated Development Post cadres have received training on NCDs and the flow of implementation of the 5 activity tables, anthropometry procedures, blood pressure measurements, and checking blood sugar and cholesterol levels (Jayusman and Widiyarta, 2017). This condition indicates cadre training is successfully prepared for implementing integrated development posts in schools. The empowerment of peer counselors aims to be actively involved to increase participation in implementing the Integrated Development Post. The involvement of cadres is needed to make the program meet the needs of the local community, especially adolescents in schools. Thus, it can foster a sense of ownership of the program and the care and empathy of peer counselors in helping their friends. Integrated Development Post activities are perceived as useful in detecting NCDs risk factors to prevent and control NCDs in their school environment (Untad et al., 2022; Wijayanti and Edita, 2023).

CONCLUSIONS

Implementing the Integrated Development Post effectively improves the knowledge and skills of cadres. NCDs risk factors in adolescents at school can be detected through Integrated Development Post activities in the school environment where peer counselors who have received training can be empowered as adolescent cadres, which are carried out regularly with the assistance of Public Health Center in the context of early prevention and control of NCDs. However, continuous monitoring and evaluation of Integrated Development Post activities needs to be carried out to increase the knowledge and skills of cadres.

ACKNOWLEDGEMENTS

The authors thank all who have participated in this research, one of the high schools in Semarang City and the Poltekkes Kemenkes Semarang, for providing the infrastructure to carry out this research activity.

REFERENCES

Andayasari, L., & Opitasari, C. (2020). Implementasi program pos pembinaan terpadu penyakit tidak menular di Provinsi Jawa Barat tahun 2015. *Jurnal Penelitian dan Pengembangan Pelayanan Kesehatan*, *3*(3), 168–181. https://doi.org/10.22435/jpppk.v3i3.2713

Befus, E. G., Mølland, E., Helseth, S., Hagen, M., Stea, T. H., Nolte, S., & Haraldstad, K. (2024). The use of youth healthcare services and its association with health-related quality of life, physical and mental health and over-the-counter analgesics use in 13–19-year-old adolescents: A cross-sectional study. *BMC Public Health*, *24*(1), 104. https://doi.org/10.1186/s12889-023-17544-0

Desalegn, B. B., Diddana, T. Z., Daba, A. K., & Tafese, T. A. (2023). Overnutrition in adolescents and its associated factors in Dale District schools in Ethiopia: A cross-sectional study. *PeerJ*, *11*, e16229. https://doi.org/10.7717/peerj.16229

Fathonah, S. (2021). Program capacity building kader remaja Posbindu PTM. *Martabe: Jurnal Pengabdian Kepada Masyarakat*, *4*(3), 1055–1062. https://doi.org/10.31604/jpm.v4i3.1055-1062

Febrianti, R., & Prabawati, I. (2017). Implementasi pelaksanaan pos pembinaan terpadu penyakit tidak menular (Posbindu PTM) di Puskesmas Pucang Sewu Kota Surabaya. *Publika: Jurnal Ilmu Administrasi Negara*, *5*(5), 1–7. Retrieved from https://ejournal.unesa.ac.id/index.php/publika/article/view/21022/19285

Firmansyah, Y., Ginting, D. N., Su, E., Sylvana, Y., Chau, W., & Setyati, P. N. (2021). Pentingnya Posbindu keliling dalam mendeteksi penyakit tidak menular di RW. 05, Kelurahan Kedaung Kaliangke. *Jurnal Muara Sains, Teknologi, Kedokteran dan Ilmu Kesehatan*, *5*(1), 9–18. https://doi.org/10.24912/jmstkik.v5i1.6344

Gelibo, T., Amenu, K., Taddele, T., Taye, G., Getnet, M., Getachew, T., ... & Bekele, A. (2017). Low fruit and vegetable intake and its associated factors in Ethiopia: A community based cross sectional NCD steps survey. *Ethiopian Journal of Health Development*, *31*(1), 355–361. Retrieved from https://www.ajol.info/index.php/ejhd/article/view/167827

Hanifah, S., Sunarto, Triastuti, A., & Rahmadiah, L. (2022). Pembentukan kader posbindu-ptm (pos pembinaan terpadu-penyakit tidak menular) di Sambiroto Purwomartani Sleman. *Prosiding Seminar Nasional Hasil Penelitian dan Pengabdian Masyarakat "Teknologi Pengolahan Dan Pengembangan Material Maju Untuk Pembangunan Berkelanjutan"*, pp. 390–396. Retrieved from https://dspace.uii.ac.id/handle/123456789/41429

Hastuti, N. M., Pupitasari, R., & Sugiarsi, S. (2019). Peran kader kesehatan dalam program posbindu penyakit tidak menular di Puskesmas Jaten. *Jurnal Ilmiah Maternal*, *3*(2), 57–61. https://doi.org/10.54877/maternal.v3i2.756

Hidayani, W. R., Nurazijah, N., Amalia, L., & Sauma, A. W. (2020). Penyuluhan faktor risiko penyakit tidak menular dan penggunaan media piring anti hipertensi pada kader posbindu penyakit tidak menular (PTM) di Desa Cikunir Kecamatan Singaparna. *Jurnal Abdimas Kesehatan Tasikmalaya*, *2*(02), 9–12. https://doi.org/10.48186/abdimas.v2i02.305

Huriyati, E., Ratrikaningtyas, P. D., Projosasmito, S. R., & Farmawati, A. (2019). Kader hidup sehat dalam upaya promotif penyakit denegeratif. *Journal of Community Empowerment for Health*, *2*(1), 36–42. https://doi.org/10.22146/jcoemph.41292

Indarjo, S., Hermawati, B., & Nugraha, E. (2019). Upaya pelatihan pos pembinaan terpadu penyakit tidak menular (Posbindu PTM) pada kader posyandu di Desa Kalikayen, Kec. Ungaran Timur, Kab. Semarang. *Jurnal Abdimas*, *23*(2), 134–138. https://doi.org/10.15294/abdimas.v23i2.17884

Jayusman, T. A. I., & Widiyarta, A. (2017). Efektivitas program pos pembinaan terpadu (POSBINDU) penyakit tidak menular (PTM)

di Desa Anggaswangi Kecamatan Sukodono Sidoarjo. *Dinamika Governance: Jurnal Ilmu Administrasi Negara*, *7*(2), 178. https://doi.org/10.33005/jdg.v7i2.1207

Kiting, R. P., Ilmi, B., & Arifin, S. (2017). Faktor yang berhubungan dengan kinerja kader Posbindu penyakit tidak menular. *Jurnal Berkala Kesehatan*, *1*(2), 106–114. http://dx.doi.org/10.20527/jbk.v1i2.3149

Lestari, R., Warseno, A., Trisetyaningsih, Y., Rukmi, D. K., & Suci, A. (2020). Pemberdayaan kader kesehatan dalam mencegah penyakit tidak menular melalui Posbindu PTM. *Adimas: Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 48–55. https://doi.org/10.24269/adi.v4i1.2439

Mahdur, R. R., & Sulistiadi, W. (2020). Evaluasi program pos pembinaan terpadu penyakit tidak menular (Posbindu PTM). *Jurnal Ilmiah Kesehatan Masyarakat: Media Komunikasi Komunitas Kesehatan Masyarakat*, *12*(1), 43–48. https://doi.org/10.52022/jikm.v12i1.55

Meidiana, R., Simbolon, D., & Wahyudi, A. (2018). Pengaruh edukasi melalui media audio visual terhadap pengetahuan dan sikap remaja overweight. *Jurnal kesehatan*, *9*(3), 478–484. https://doi.org/10.26630/jk.v9i3.961

Miller, R. L., Bernstein, R. M., Sanchez, N., Gutierrez-Colina, A. M., Ruzicka, E. B., Bell, C., Johnson, S. A., Shomaker, L. B., & Lucas-Thompson, R. G. (2023). Daily mindfulness, negative affect, and eating behaviors in adolescents at risk for excess weight gain. *International Journal of Eating Disorders*, *56*(9), 1801–1806. https://doi.org/10.1002/eat.23981

Ministry of Health. (2018). *Hasil Utama Riskesdas*. Indonesian Republic Ministry of Health. Retrieved from https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98f00/files/Hasil-riskesdas-2018_1274.pdf

Mintarsih, S. N., Ambarwati, R., Rahmawati, A. Y., & Mardiana, M. (2022). Deteksi dini faktor resiko ptm pada remaja berbasis Posbindu. *Jurnal Riset Gizi*, *10*(2), 86–93. https://doi.org/10.31983/jrg.v10i2.9477

Nisa, A. A., Nugroho, E., Eidyarsari, P., Utami, A. N. M., Suci, C. W., Laily, L. A., & Yuswantoro, R. N. (2022). Implementasi Posbindu PTM untuk mendukung UNNES menjadi kampus sehat. *Jurnal Pengabdian Kesehatan Masyarakat: Pengmaskesmas*, *2*(2), 146–153. https://doi.org/10.31849/pengmaskesmas.v2i2/6593

Pranandari, L. L., Arso, S. P., & Fatmasari, E. Y. (2017). Analisis implementasi program pos pembinaan terpadu penyakit tidak menular (posbindu PTM) di Kecamatan Banguntapan Kabupaten Bantul. *Jurnal Kesehatan Masyarakat*, *5*(4), 76–84. https://doi.org/10.14710/jkm.v5i4.18319

Raptou, E. (2021). The role of snack choices, body weight stereotypes and smoking behavior in assessing risk factors for adolescent overweight and obesity. *Foods*, *10*(3), 557. https://doi.org/10.3390/foods10030557

Rohmayanti, R., Istutik, D., Islamiyah, I., Rahmawati, R., & Septiandani, Z. (2021). Pembentukan kader Posbindu PTM tingkatkan skill kader dan partisipasi warga sebagai upaya mengatasi penyakit tidak menular di Desa Rambeanak, Magelang. *Community Empowerment*, *6*(3), 404–410. https://doi.org/10.31603/ce.4221

Suranata, K. (2013). Pengembangan model tutor bimbingan konseling sebaya (peer counseling) untuk mengatasi masalah mahasiswa Fakultas Ilmu Pendidikan Undiksha. *JPI (Jurnal Pendidikan Indonesia)*, *2*(2), 255–263. https://doi.org/10.23887/jpi-undiksha.v2i2.2170

Untad, V., Napirah, M. R., & Pongsapan, N. (2022). Factors related to the utilization of the Integrated Development Posts of Non-Communicable Diseases (POSBINDU PTM) in Bulili Health Centre Area. *Open Access Macedonian Journal of Medical Sciences*, *10*(E), 27–32. https://doi.org/10.3889/oamjms.2022.6936

Wijayanti, A. C., & Edita, E. P. (2023). Pengaruh pemberian media poster kesehatan terhadap minat remaja mengikuti posbindu PTM Article history. *Jurnal Cakrawala Promkes*, *5*(2), 115–121. https://doi.org/10.12928/promkes.v5i2.8297