



Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases

Nabillah Ainun Kusrinanti, Padma Fitriana Setyaningtyas, Hafiz Adhitama Hepni, Thoriq Naufal Adiba, Ginanjar Zukhruf Saputri, Woro Supadmi, Mila Abusri

*Department of Pharmacy, Faculty of Pharmacy, Universitas Ahmad Dahlan
Jl Prof Dr.Soepomo, Umbulharjo, Yogyakarta, 55164, Indonesia*

ABSTRACT

ARTICLE INFO:

Received: 2024-08-03
Revised: 2024-09-05
Accepted: 2024-10-12
Published: 2024-11-30

Keywords:

Cadre, Elderly, Non-communicable disease, Screening

Sathya Sai Primary School provides a variety of extracurricular activities that students can choose from. The Scientific Work Group is one of the extracurricular activities at SD Sathya Sai. SD Satya Sai's Scientific Work Group innovated furikake made from sea lettuce. They won a gold medal in a national event through this processed innovation. The furikake produced by the partners has a slightly bitter taste and durability of only 2 weeks. The purpose of this PKM (community service) activity is to process furikake that is not bitter and has a long product durability. The method used in this activity is training and mentoring. This PKM activity resulted in an increase in partners' understanding of how to process furikake and use appropriate technology tools provided by the PKM team and an increase in furikake durability. In addition, this activity also increased the number of processed innovative products made from sea lettuce. With this PKM activity, it is hoped that the SD Sathya Sai Scientific Work Group can produce other innovative products made from sea lettuce using appropriate technology tools that have been provided by the PKM team.

©2024 Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang
This is an open access article distributed under the CC BY-SA 4.0 license
(<https://creativecommons.org/licenses/by-sa/4.0/>)

How to cite: Kusrinanti, N. A., Setyaningtyas, P. F., Hepni, H. A., Adiba, T. N., Saputri, G. Z., Supadmi, W., & Abusri, M. (2024). Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 9(4), 876-885.
<https://doi.org/10.26905/abdimas.v9i4.13826>

1. INTRODUCTION

The growing elderly population requires focused efforts to enhance their well-being and address their specific needs (Bahriah et al., 2024). According to the World Health Organization (WHO), non-communicable diseases (NCDs) are long-term, chronic conditions that arise not from microbial infections but from a combination of genetic predispositions, physiological changes, environmental exposures, and lifestyle choices. These diseases typically develop over an extended period. Data from the Global Burden of Disease (2019) reveals that NCDs have become the leading cause of death, with their prevalence increasing steadily over recent decades, as depicted in Figure 1. In addition to their substantial contribution to mortality, NCDs significantly impact disability rates and impose considerable strain on economic resources.

Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases

Nabillah Ainun Kusrinanti, Padma Fitriana Setyaningtyas, Hafiz Adhitama Hepni, Thoriq Naufal Adiba, Ginanjar Zukhruf Saputri, Woro Supadmi, Mila Abusri

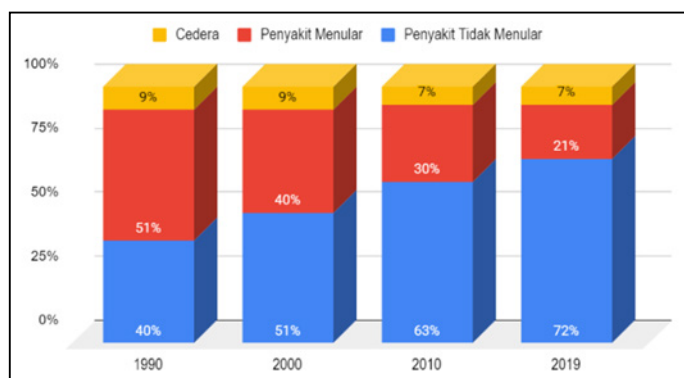


Figure 1. Shift in causes of death in 1990-2019

Cases of non-communicable diseases (NCDs) most commonly found include cardiovascular diseases (hypertension) and diabetes mellitus. Data from the International Diabetes Federation (2021) indicates that around 415 million people aged 20-79 worldwide suffer from diabetes mellitus (DM) and hypertension, of which 10 million are residents of Indonesia (Sun et al., 2023). The government continues to strive to address these disease cases. According to the results of the Indonesian Health Survey in 2023, there was a decrease in the prevalence of hypertension, which was 30.8 percent (Kemenkes RI, 2023), though still not significant compared to the 2018 Basic Health Research (Riskesmas) results of 34.1 percent (Kemenkes RI, 2018).

The Special Region of Yogyakarta (DIY) is one of the provinces with a higher prevalence of non-communicable diseases compared to the national average, most of which are suffered by the elderly population. Data from Kemenkes RI (2018), shows that the prevalence of diabetes mellitus in DIY was 4.5 percent compared to the national rate of 2.4 percent, while hypertension was 10.7 percent compared to the national rate of 8.4 percent, with cases trending upward annually. Purwosari Village is one of the villages in Kulon Progo Regency, DIY. Data from the Kulon Progo Health Office indicates that Purwosari Village has a high number of non-communicable diseases, including hypertension among the elderly, which accounts for 93 out of 458 elderly residents. These significant numbers highlight non-communicable diseases as a critical issue that must be addressed and resolved (Kemenkes RI, 2021).

Several methods to prevent and address non-communicable disease cases include education, early detection, and regular health check-ups (Kodir & Margiyati, 2019). However, in practice, the community often encounters challenges, including those experienced by the residents of Purwosari Village. Preliminary survey results conducted among community leaders in Purwosari Village indicate several barriers, such as remote access to healthcare services, limited transportation options, and steep travel terrain, considering the demographic location of Purwosari Village in the Menoreh Hills, Kulon Progo. Some posyandu cadres (integrated health service posts) also conduct home care (home visits) for elderly individuals with mobility limitations. Nevertheless, not all elderly posyandu have been able to implement this approach due to a lack of knowledge and skills in elderly health screening. Assistance for cadres is crucial to optimizing their role in preventing and mitigating the severity of non-communicable diseases among the elderly in Purwosari Village.

Various models of cadre assistance for the elderly have been implemented, such as empowering posbindu (integrated health post) cadres for the elderly in Demak, which proved effective in improving knowledge and skills in basic non-communicable disease screening among cadres (Armiyati et al., 2014). Regular monthly posyandu activities for the elderly have been shown to effectively maintain elderly health through services including weight and height measurements, blood pressure checks, simple laboratory

screenings such as blood sugar tests, and educational sessions by doctors or experts (Kusumawardani & Andanawarih, 2018).

Based on these findings, a health promotion-based assistance model has been developed through the SEGAR (Healthy-Fit) Cadre School program in Yogyakarta City, which has been effective in enhancing knowledge and skills among elderly cadres. The SEGAR Cadre School program is designed with three sessions focusing on strategies for preventing non-communicable diseases (hypertension, diabetes, and cholesterol), the use of TOGA (Family Medicinal Plants) for non-communicable diseases, and food safety, particularly given the inclusion of supplementary feeding (PMT) in posyandu activities (Akrom et al., 2024). Based on these findings, this community service program aims to provide assistance and strengthen the capacity of posyandu cadres in Purwosari Village through education on NCD prevention and assistance in disease screening for the elderly. This program aims to improve the capacity of posyandu cadres in addressing non-communicable diseases and help educate and routinely monitor the health of the elderly in Purwosari Village in the future.

2. METHODS

The implementation of activities was conducted through the Healthy and Fit Cadre School (SEGAR) program organized by the executing team on June 23, 2024, followed by a simulation follow-up for elderly posyandu cadres on Saturday, July 6, 2024, at the Purwosari Village Hall, Kulonprogo. The SEGAR Cadre School was carried out using a lecture method to provide education on preventing non-communicable diseases (hypertension, diabetes, and cholesterol) as an effort to reduce the prevalence of these diseases. The session featured a lecturer from the Faculty of Pharmacy, UAD, as the speaker. The school was conducted in a single session lasting 90 minutes and attended by 67 elderly posyandu cadres from the SEGAR program in Purwosari Village.



Figure 2. SEGAR cadre school pocket book media (Prevention of non-communicable diseases hypertension and diabetes in the elderly) File: https://bit.ly/Materi_Edukasi_SekolahLansia

Efforts to improve knowledge were made by providing educational materials on preventing non-communicable diseases through structured curriculum-based pocketbooks. These books covered definitions, signs and symptoms, complications, prevention, utilization of Family Medicinal Plants (TOGA), elderly physical activity management, follow-up, and screening related to hypertension, diabetes, and cholesterol. The lectures were supported by PowerPoint presentations and active-interactive discussions focused on preventing hypertension, diabetes, and cholesterol. Additionally, educational sessions

Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases

Nabillah Ainun Kusrinanti, Padma Fitriana Setyaningtyas, Hafiz Adhitama Hepni, Thoriq Naufal Adiba, Ginanjar Zukhruf Saputri, Woro Supadmi, Mila Abusri

included leaflet-based media emphasizing curative and preventive measures for non-communicable diseases, specifically hypertension and diabetes mellitus.

The cadre’s understanding was evaluated based on knowledge variables measured using pre-test and post-test questionnaires. Cadre knowledge was categorized into high knowledge levels (score > mean) and low knowledge levels (score < mean).

The follow-up activity was conducted using the elderly screening method, attended by 50 elderly posyandu cadres and 29 elderly individuals from the villages of Sabrang Kidul, Patehombo, and Tegalsari. The parties involved in this activity were the Drug Information and Research Center (PIKO) and the Alumni Family of UAD (KAMADA) UAD Faculty of Pharmacy as the health equipment provider, and the Pharmaceutical Care Community (KFP) as volunteers assisting with the screening. The Education phase was maximized by involving pharmacy counselors from UAD Pharmacy, and doctors and nurses from the Promkes team at Girimulyo 2 Health Center, Purwosari Village, Kulonprogo.

Table 1. Stages of implementation of SEGAR cadre school mentoring activities

| Schedule and Stages of Community Service Activities | | | |
|--|---|---|--|
| Activities | Date | Description | Objectives |
| Planning and Preparation Stage | 4 th June 2024 | <ul style="list-style-type: none"> - Coordination with community leaders regarding community service activities. - Observation related to non-communicable disease problems (hypertension and diabetes) in fostered villages. - Designing concepts and creating learning media. | Knowing the level of spread of non-communicable diseases (hypertension and diabetes) that occurs in Purwosari Village |
| Implementation Stage | 23 rd June 2024 29 th June 2024 6 th July 2024 | <ul style="list-style-type: none"> - Education and learning related to the prevention of non-communicable diseases (hypertension and diabetes) - Introduction to tools and training for screening non-communicable diseases (hypertension and diabetes). | Mentoring interventions through curriculum books, pocket books, leaflets, powerpoints, and lectures related to prevention education to reduce the number of non-communicable diseases (hypertension and diabetes) |
| Evaluation Stage | 10 th August 2023 | <ul style="list-style-type: none"> - Implementation of pretest before education and posttest after education on elderly posyandu cadres. - Assessment of skills and knowledge related to screening for non-communicable diseases (hypertension and diabetes) - Implementation of screening for non-communicable diseases (hypertension and diabetes) in the elderly. | Increasing the capacity of cadres and early detection of elderly health as measured through assessments related to the use of digital tensiometers and GCU Meter Devices in screening for non-communicable diseases (hypertension and diabetes) including height, weight, blood pressure, random blood sugar, and uric acid. |

3. RESULTS AND DISCUSSION

Results

The empowerment activity was organized through the provision of education related to preventive and curative efforts in preventing non-communicable diseases (hypertension and diabetes). The health

promotion-based empowerment activity was packaged in the form of a Fresh Cadre School (healthy-fit) with education delivery. The education was provided directly through face-to-face meetings as well as through the WhatsApp social media platform. Through the face-to-face meetings, cadres were able to engage in question-and-answer sessions (discussions) directly with the speakers and receive more specific and detailed information about the prevention of hypertension and diabetes. Meanwhile, the use of WhatsApp social media facilitated cadres in continuing discussions even after the meetings were held.



Figure 3. Implementation of Cadre School Session 1: (a) Provision of educational media; (b) Education on prevention of NCDs; and (c) Health screening training

The activity also included education and practical simulations related to the proper use of simple health screening tools and the interpretation of the screening results. Thus, the cadres participating in the empowerment activity were able to understand how to use the simple health screening tools correctly and learn how to interpret the screening results so that they could be applied in everyday life.

The evaluation of the education provided was followed up with a simulation of elderly screening. The evaluation of the cadres' ability (skills) was assessed based on their ability to use health-check tools such as the digital sphygmomanometer and GCU test. This activity aimed to evaluate whether the cadres were able to use the simple health screening tools, specifically the GCU test, correctly and accurately, as well as to determine if they understood how to read the screening results. In this activity, the cadres were asked to perform the test using the digital sphygmomanometer and GCU test and interpret the results themselves. The purpose of this activity was to measure the cadres' abilities in using health-check tools.



Figure 4. Implementation of Cadre School Session 2: (a) Elderly health screening; (b) Assessment of cadre screening capacity; and (c) Elderly health counseling

After completing the screening, the elderly individuals were given the opportunity to consult with health experts, including doctors, nurses, and pharmacists, regarding their screening results. This activity aimed to provide early detection of hypertension, diabetes, and uric acid levels. Additionally, it aimed

Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases

Nabillah Ainun Kusrinanti, Padma Fitriana Setyaningtyas, Hafiz Adhitama Hepni, Thoriq Naufal Adiba, Ginanjar Zukhruf Saputri, Woro Supadmi, Mila Abusri

to raise awareness among the elderly about self-care for their health. During this opportunity, health experts would also provide further explanations about the screening results and offer suggestions to improve the elderly's health. This activity is expected to help improve the quality of life of the elderly and raise public awareness about the importance of health.

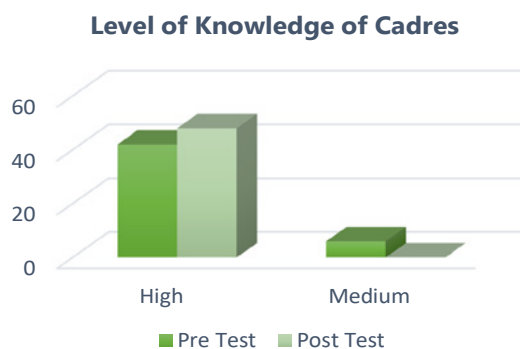


Figure 5. Level of knowledge of cadres regarding prevention of PTM

The capacity improvement of the cadres was assessed in terms of knowledge and skills. Based on Figure 3, the data analysis from the cadre knowledge questionnaire related to the prevention of non-communicable diseases (hypertension, diabetes, and uric acid) measured through pretest and posttest is shown. The analysis results indicate an improvement among 68 elderly posyandu cadres, with 48 people selected as the sample. The knowledge level measurement before the education (pre-test) showed that 42 cadres (84 percent) had high knowledge, while 6 cadres (12 percent) had low knowledge. The analysis results showed a significant improvement after the education was provided to the cadre participants. According to the graph (Figure 3), there was a 100 percent increase in cadres with high knowledge and 0 percent in the low knowledge category.

The capacity level of the cadres related to the screening of non-communicable diseases (hypertension, diabetes, and uric acid) was measured, including the ability of the cadres to operate the tools and their knowledge related to interpreting the screening results. The testing process was carried out by assessing 50 elderly posyandu cadres. The test results showed variation in the cadres' capacity levels based on two aspects: ability and knowledge. In terms of ability, 72 percent of the cadres present were in the high category, 20 percent were in the medium category, and 8 percent were in the low category. Meanwhile, in terms of knowledge, 76 percent of the cadres were in the high category, 18 percent were in the medium category, and 6 percent were in the low category (Figure 5).

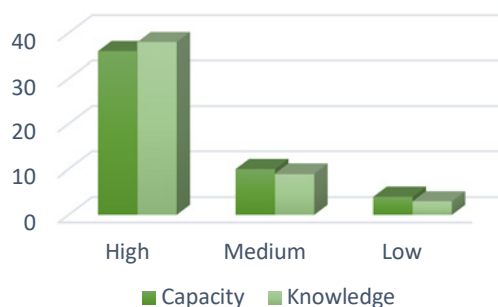


Figure 6. Capacity level of cadres related to PTM Screening

The simulation session for screening non-communicable diseases (hypertension, diabetes, and uric acid) in the elderly was conducted by checking 29 elderly individuals from the villages of Sabrang Kidul, Patehombo, and Tegalsari in Purwosari Village. The screening was carried out through blood pressure measurement, blood sugar, and uric acid levels as an early detection effort for hypertension, diabetes, and uric acid. Based on Figure 6, the sampling data shows that 60.8 percent of the elderly had normal blood pressure (120-129/80-84 mmHg), 8.9 percent were in the pre-hypertension category (130-139/85-89 mmHg), 15.2 percent had stage 1 hypertension (140-159/90-99 mmHg), 13.8 percent had stage 2 hypertension (160-179/100-109 mmHg), and only 1.3 percent of the elderly had stage 3 hypertension (>180/110 mmHg).

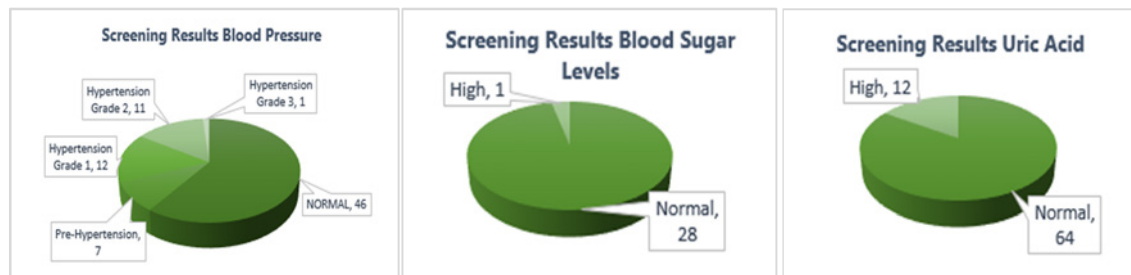


Figure 7. Screening results: (a) Blood pressure; (b) Blood sugar levels; and (c) Uric acid

The results of the uric acid screening showed that the majority of elderly people (84.6 percent) had uric acid levels in the normal range (2.6-6 mg/dL), while 15.4 percent were in the high category (>6 mg/dL). Furthermore, blood sugar level examination showed that 96.6 percent of elderly people had normal blood sugar levels (200 mg/dL) and only 3.4 percent were in the high category (>200 mg/dL).

Discussion

Purwosari Village is one of the villages located in Girimulyo District, Kulon Progo Regency, Yogyakarta. According to information obtained by the implementation team through interviews with the village authorities, the main health issues prevalent in the area are non-communicable diseases such as hypertension, diabetes mellitus, and uric acid, which are mostly suffered by the elderly. Based on observations from the local health cadre coordinator and a Focus Group Discussion (FGD), it was noted that the most common non-communicable diseases in Purwosari Village are hypertension, diabetes, and uric acid.

This area has very active and committed health cadres who drive the community to participate in activities organized by the local health promotion team (promkes). Through these cadres, all forms of health information and education provided by promkes are communicated to the broader community. This represents a potential that needs to be taken into account and further empowered, as these cadres play a significant role in raising awareness and actively addressing health issues. Therefore, as part of the effort to tackle non-communicable diseases (hypertension, diabetes, and uric acid), capacity building for the cadres was carried out through the implementation of the SEGAR Cadre School and follow-up health screenings. As a result, the cadres will become more independent and competent in carrying out their tasks in the area. They will be more effective in helping the community increase awareness about the importance of health and actively participate in activities related to the prevention of non-communicable diseases. This aligns with research conducted by [Trisnowati \(2018\)](#), which found that

community cadre empowerment in the prevention of non-communicable diseases (hypertension and diabetes) is quite effective. Community empowerment through health promotion activities has been shown to be effective in preventing non-communicable diseases (such as hypertension and diabetes). Involvement of community leaders and an increase in positive perceptions and knowledge about non-communicable diseases (hypertension and diabetes) are factors that contribute to the success of the program (Trisnowati, 2018).

The aim of this activity is to raise community awareness about the importance of the prevention and early detection of non-communicable diseases such as hypertension, diabetes, and uric acid, as an effort to reduce the prevalence of these diseases. It is hoped that the prevalence of non-communicable diseases (hypertension, diabetes, and uric acid) in Indonesia will decrease, enabling the community to live a more balanced and prosperous life. This aligns with the previous implementation of assistance using the CBIA (Active Learning Method) with a simple screening simulation for non-communicable diseases, which was found to effectively improve the skills of the cadres (Ranti, 2022).

Based on Figure 3, the increase in knowledge during this activity is in line with the community service conducted by Khasanah et al. (2019), which found that methods such as lectures, leaflets, and PowerPoint presentations were effective in enhancing community knowledge. The same result was confirmed by the research of El Khuluqo & Nuryati (2020), which showed that training and mentoring of elderly posyandu cadres were beneficial in improving elderly health services at posyandu centers. The increased knowledge of the cadres observed in the post-education measurement aligns with the research by Daryanto & Mila (2020), which focused on cadre empowerment using PowerPoint-based lectures, discussions, and screening simulations. Their study indicated that the methods used were effective in enhancing the capacity of the cadres (Daryanto & Mila, 2020).

Based on the sampling data from the screening of hypertension, diabetes, and uric acid (Figure 6), the majority of the elderly had normal blood pressure, which accounted for 60.8 percent. Meanwhile, 8.9 percent were in the pre-hypertension category, 15.2 percent had stage 1 hypertension, 13.8 percent had stage 2 hypertension, and only 1.3 percent had stage 3 hypertension. The uric acid screening results showed that the majority of the elderly had normal uric acid levels (84.6 percent), with 15.4 percent in the high category. Additionally, the blood sugar examination revealed that 96.6 percent of the elderly had normal blood sugar levels, and only 3.4 percent had high levels.

Based on the results of the community service activities in Purwosari Village, it shows that the mentoring model based on the Healthy Cadre School is considered quite effective in improving the capacity of elderly posyandu cadres. The follow-up or continuation of the Healthy Cadre School in the form of a class based on a WhatsApp group was also deemed effective as a communication and coordination forum for the elderly cadres. The Healthy Cadre School activities are expected to synergize with the Health Promotion team at the local health center, thereby maximizing efforts to prevent non-communicable diseases such as hypertension, diabetes, and uric acid in the elderly.

4. CONCLUSION AND RECOMMENDATIONS

As with the objectives of the program, which are to enhance the capacity of health cadres in Purwosari Village in the prevention of non-communicable diseases such as hypertension, diabetes, and uric acid in the elderly, based on the activities conducted, it can be observed that: (1) The participation level of cadres in the community service activities based on the SEGAR Elderly Cadre School and follow-up health screenings was very high, with cadre attendance reaching 100 percent. (2) There was a 12 percent increase in understanding among the posyandu cadres after receiving education on the prevention of

non-communicable diseases (hypertension, diabetes, and uric acid). (3) The majority of the cadres, 72 percent in terms of ability and 76 percent in terms of knowledge, have understood the procedures for using and interpreting screening results. Education through curriculum books, pocketbooks, leaflets, lectures, and screening training proved effective in enhancing the capacity of the cadres. It is hoped that this activity will further increase awareness of the importance of early prevention and screening for hypertension, diabetes, and uric acid, thereby reducing the prevalence of these diseases in Indonesia.

Based on the results of this community service, the enthusiasm of the cadres in participating in the Healthy Cadre School Program has become one of the village's potentials. However, the village's challenging and distant demographics pose a challenge for the cadres in providing follow-up and support to the local elderly. For some elderly individuals with limited mobility, home care services can be provided, either by the health cadres themselves or in collaboration with the health promotion team from the local health center. To ensure the sustainability of the healthy village cadre program, it can be supported by improving health facilities, such as providing blood pressure measurement devices (tensimeter) for screening, as well as simple screening tools for checking blood sugar, uric acid, and cholesterol.

ACKNOWLEDGEMENTS

We would like to express our gratitude to the Ministry of Education and Culture of the Republic of Indonesia (KEMENDIKBUD RI) for the grant for the student organization capacity building program (PPKO) of the Pharmacy IMM UAD. We also extend our thanks and appreciation for the active participation of the counselors, doctors, and nurses from the Health Promotion team of Girimulyo 2. Additionally, we acknowledge the support and active participation of the Purwosari Village government, the community, and the health cadres of Purwosari in the success of the Elderly Posyandu Cadre School SEGAR mentoring activity.

REFERENCES

- Akrom, A., Utami, D., & Saputri, Z. G. (2024). Implementasi sekolah lansia SEGAR (Sehat-Bugar) sebagai upaya peningkatan kualitas hidup dan pencegahan penyakit degeneratif pada lansia Kalurahan Wirobrajan Yogyakarta. In *Seminar Nasional Hasil Pengabdian kepada Masyarakat*, 288–300.
- Armiyati, Y., Soesanto, E., & Hartiti, T. (2014). Pemberdayaan kader posbindu lansia sebagai upaya peningkatan kualitas hidup lansia di desa Kangkung Demak. In *Prosiding Seminar Nasional & Internasional*, 1-5.
- Bahriah, B., Sumartini, S., Setyarini, E. A., Wahyudin, D., Syafitri, R., Susilowati, Y. A., Restipa, L., Sihombing, F., Setyaningsih, W., Susanti, F., Sipollo, B. V., Kusuma, M. D. S., Mulyana, H., Febriana, D., Yuningsih, A., Rosyid, L. S., & Sulistiyani, S. (2024). *Buku ajar keperawatan gerontik (Berdasarkan Kurikulum Pendidikan Ners Indonesia Tahun 2021)*. Eureka Media Aksara.
- Daryanto, D., & Sari, M. T. (2021). Pemberdayaan kader posyandu lansia dalam deteksi dini risiko dan pencegahan depresi pada lanjut usia di Desa Penyengat Olak Muaro Jambi. *Jurnal Abdimas Kesehatan (JAK)*, 3(1), 81-86. <https://doi.org/10.36565/jak.v3i1.159>
- El Khuluqo, I., & Nuryati, T. (2020). Pelatihan dan pendampingan kader posyandu lansia di Wilayah Kerja Puskesmas Cimuning. *Jurnal Pemberdayaan Masyarakat Universitas Al Azhar Indonesia*, 2(1), 437743. <http://dx.doi.org/10.36722/jpm.v2i1.358>

Cadre school-based elderly health assistance and screening for the prevention of non-communicable diseases

Nabillah Ainun Kusrinanti, Padma Fitriana Setyaningtyas, Hafiz Adhitama Hepni, Thoriq Naufal Adiba, Ginanjar Zukhruf Saputri, Woro Supadmi, Mila Abusri

- Global Burden of Disease (GBD). (2019). *Results: Cause of death or injury*. Institute for Health Metrics and Evaluation (IHME). Retrieved from: <https://vizhub.healthdata.org/gbd-results/>
- International Diabetes Federation (IDF) Diabetes Atlas 10th Edition Committee. (2021). *IDF Diabetes Atlas* (10th Edition). International Diabetes Federation.
- Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2018). *Hasil riset kesehatan dasar tahun 2018*. Kementerian Kesehatan Republik Indonesia.
- Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2021). *Studi kohort faktor risiko penyakit tidak menular tahun 2021*. Kementerian Kesehatan Republik Indonesia.
- Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2023). *Survei kesehatan Indonesia tahun 2023*. Kementerian Kesehatan Republik Indonesia.
- Khasanah, U., Anwar, S., Sofiani, Y., Kurwiyah, N., & Nurhayati, N. (2019, December). Edukasi masyarakat dalam peningkatan pencegahan dan perawatan hipertensi dan DM Desa Kaliasin Kecamatan Sukamulya Kabupaten Tangerang. In *Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ*.
- Kodir, K., & Margiyati, M. (2019). Pemeriksaan kesehatan untuk deteksi dini PTM sebagai upaya mewujudkan Program Germas. *Jurnal Pengabdian Kepada Masyarakat Sisthana*, 1(1), 1-10. <https://doi.org/10.55606/pkmsisthana.v1i1.19>
- Kusumawardani, D., & Andanawarih, P. (2018). Peran posyandu lansia terhadap kesehatan lansia di Perumahan Bina Griya Indah Kota Pekalongan. *Siklus: Journal Research Midwifery Politeknik Tegal*, 7(1), 273-277. <https://doi.org/10.30591/siklus.v7i1.748>
- Ranti, I. (2022). Peningkatan pengetahuan dan keterampilan skrining penyakit tidak menular pada kader kesehatan POSBINDU. *Jurnal Surya Masyarakat*, 4(2), 253-256. <https://doi.org/10.26714/jsm.4.2.2022.253-256>
- Sun, H., Saeedi, P., Karuranga, S., Pinkepank, M., Ogurtsova, K., Duncan, B. B., Stein, C., Basit, A., Chan, J. C. N., Claude Mbanya, J., Pavkov, M. E., Ramachandaran, A., Wild, S. H., James, S., Herman, W. H., Zhang, P., Bommer, C., Kuo, S., Boyko, E. J., & Magliano, D. J. (2023). Erratum to " IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045 "[Diabetes Res. Clin. Pract. 183 (2022) 109119]. *Diabetes Research and Clinical Practice*, 204, 110945. <https://doi.org/10.1016/j.diabres.2023.110945>
- Trisnowati, H. (2018). Pemberdayaan masyarakat untuk pencegahan faktor risiko penyakit tidak menular (Studi pada pedesaan di Yogyakarta). *Jurnal MKMI: Media Kesehatan Masyarakat Indonesia*, 14(1), 17-25. <https://doi.org/10.30597/mkmi.v14i1.3710>
-