Prevención de las enfermedades no transmisibles en las personas mayores: Un enfoque holístico a través del posbindu y las actividades físicas

Preventing Non-Communicable Diseases in the Elderly: A Holistic Approach through Posbindu and Physical Activities

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Abstract

Introduction: the current health problem in Indonesia is the double burden of disease, namely the presence of infectious diseases plus the increase in non-communicable diseases (NCD).
Objective: this research aims to propose actionable strategies to improve the utilization of Posbindu services, ultimately contributing to the prevention of NCDs at the elderly.
Methodology: the research design with an analytical observational method with a Cross-Sectional approach. The sample in this study was 376 randomly selected. This research was conducted in Kabupaten Labuhan Batu Utara.
Results: the results of the Mann-Whitney statistical test on the knowledge variable obtained a p-value > 0.05, which stated that there was no significant difference in the knowledge of the respondents who used and did not use the program Posbindu.
Discussion: the results of the Independent Sample T-test statistical test on the attitude variable, behaviour variable, family support variable, stakeholder support variable, self-motivation variable, and mileage variable also have a p-value> 0.05, which means that there is no significant difference between the variables of family support, stakeholder support, self-motivation and distance to Posbindu with the respondent groups who use Posbindu and those who do not use.
Conclusion: the elderly who know about the existence of Posbindu, make them live healthier. Because they have gained knowledge about how to live a healthy lifestyle and how to prevent non-communicable diseases. They believe that as they get older, many diseases can infect their bodies so they must start learning to adopt a healthy lifestyle.

Keywords

Non-communicable diseases; integrated health post; physical activity; posbindu

Resumen

Introducción: el problema sanitario actual en Indonesia es la doble carga de morbilidad, a saber, la presencia de enfermedades infecciosas más el aumento de las enfermedades no transmisibles (ENT).
Objetivo: esta investigación pretende proponer estrategias de actuación para mejorar la utilización de los servicios de Posbindu, contribuyendo en última instancia a la prevención de las ENT en la tercera edad.
Metodología: el diseño de la investigación con un método observacional analítico con un enfoque transversal. La muestra de este estudio fue de 376 personas seleccionadas al azar. Esta investigación se llevó a cabo en Kabupaten Labuhan Batu Utara.
Resultados: los resultados de la prueba estadística de Mann-Whitney sobre la variable conocimientos obtuvieron un valor p > 0,05, lo que afirmó que no había diferencias significativas en los conocimientos de los encuestados que utilizaban y no utilizaban el programa Posbindu.
Discusión: los resultados de la prueba estadística T-test de muestra independiente sobre la variable actitud, la variable comportamiento, la variable apoyo familiar, la variable apoyo de las partes interesadas, la variable automotivación y la variable distancia a Posbindu también tienen un valor p> 0,05, lo que significa que no hay diferencia significativa entre las variables de apoyo familiar, apoyo de las partes interesadas, automotivación y distancia a Posbindu con los grupos de encuestados que utilizan Posbindu y los que no lo utilizan.
Conclusión: los ancianos que conocen la existencia de Posbindu, hacen que vivan más sanos. Porque han adquirido conocimientos sobre cómo llevar un estilo de vida saludable y cómo prevenir las enfermedades no transmisibles. Creen que a medida que envejecen, muchas enfermedades pueden infectar sus cuerpos, por lo que deben empezar a aprender a adoptar un estilo de vida saludable.

Palabras clave

Enfermedades no transmisibles; puesto sanitario integrado; actividad física; posbinduismo

Introduction

Non-communicable diseases (NCDs) are diseases that can cause more than 75% of deaths in the world. The types of NCDs that cause death are cardiovascular diseases, cancer, chronic respiratory disease, obesity, hypertension, and diabetes mellitus (Poniasih et al., 2024). Risk factors for noncommunicable diseases are smoking, alcohol consumption, unhealthy diet, lack of physical activity, salt intake, and metabolic risk factors such as increased blood pressure, increased blood glucose, and obesity (Abdul-Mutalib et al., 2012; Dzudie et al., 2024). These risk factors can result in disability, premature death, and loss of productivity and are capable of creating health, social, and economic crises (Jayanna et al., 2019; Jennings & Astin, 2017). If NCD is not controlled, it will result in complications, disability, death, and a high burden of medical expenses. To control NCDs, the management system of existing health programs in Indonesia needs to be improved.

The Government of Indonesia has created a program to control NCDs, namely the Integrated Health Post (Posbindu). Posbindu is a Community Resource Health Effort (UKBM) oriented towards promotive and preventive efforts in the control of NCDs involving the community with the aim of public awareness, increasing public health knowledge and status of NCDs so that the cases can be controlled and their prevalence decreases (Oktarianita et al., 2020). The goal of achieving Posbindu utilization above must be 100%; in 2018, the percentage of Posbindu utilization in each village was only 42.92%.

Despite its potential to control NCD risk factors, Posbindu faces challenges such as low participation rates and insufficient resources (Oktarianita et al., 2020; Sudharma et al., 2016). Empowerment is still not optimal in involving community participation in prevention, making the community a subject in implementing the Posbindu PTM (D. W. R. Sari & Savitri, 2018; Tanjung et al., 2018). The North Sumatra province has a total of 2,214 Posbindu units. Several studies of PTM Posbindu in North Sumatra show that its implementation is still not optimal due to the number of visits that have not reached> 50%. The percentage of villages that run PTM posts in north Sumatra Province in 2016 was 7.46% or 456 of the 6110 villages.

Studies have shown that age, knowledge level, and cadre support significantly influence community engagement in Posbindu activities (Bengan et al., 2022; Dodd et al., 2019; Mashdariyah & Rukanah, 2019). To optimise the Posbindu program, strategies such as intensive training for health workers, increasing activity frequency, cross-sector collaboration, and improving funding, infrastructure, and drug supplies have been proposed (Nugraheni & Hartono, 2018; Oktarianita et al., 2020). Addressing behavioural risk factors like inadequate fruit and vegetable consumption, lack of physical activity, and smoking is crucial. Notably, NCDs increasingly affect younger populations, and necessitating campus-based Posbindu initiatives to address behavioural and intermediate risk factors like elevated blood pressure, BMI, and diabetes mellitus (Duma et al., 2024; Korcz et al., 2024). Enhancing community awareness and commitment to NCD prevention through Posbindu is essential, particularly among younger populations, as NCDs increasingly affect youth and threaten their productivity (Duma et al., 2024; Sudharma et al., 2016).

Community can be trained to prescribe and promote physical activity, which is crucial in low-resource settings (Musoke et al., 2021; Watson et al., 2023). This includes ongoing training and supervision to ensure they are well-equipped to handle NCD prevention and management. Engaging CHWs in community mobilization and health education can enhance their involvement and effectiveness in NCD prevention (Musoke et al., 2021). Implementing community-wide interventions (CWIs) based on social marketing can promote physical activity among middle-aged and older adults (Kamada et al., 2015). These campaigns should focus on creating awareness and changing perceptions about physical activity. Engaging various stakeholders, including healthcare providers, policymakers, and community leaders, is essential for successfully implementing health programs (Kadariya et al., 2023; Van Hout et al., 2024). This can help address structural inequalities and mobilize community resources. To optimize Posbindu's effectiveness, there is a need for increased commitment to NCD prevention and control and efforts to improve community awareness and participation in the physical activities program.

Physical activity is a proven strategy for preventing and managing NCDs. Regular participation in physical activities can help reduce the risk of chronic diseases, improve overall health, and foster a sense of community. Integrating physical activity programs into Posbindu services can enhance community participation and maximize the program's effectiveness. This study explores the role of community

engagement and physical activity strategies in optimizing Posbindu programs in North Sumatra. By incorporating culturally relevant and accessible physical activities, this research aims to propose actionable strategies to improve the utilization of Posbindu services, ultimately contributing to the prevention of NCDs at the elderly.

Method

This study uses analytical observational methods with a cross-sectional approach. This research aims to propose actionable strategies to improve the utilization of Posbindu services, ultimately contributing to the prevention of NCDs at the elderly. Independent variables in the study are knowledge attitudes, behaviours (physical activities), family support, stakeholder support and Mileage. Meanwhile, the dependent variable is the utilization of PTM Posbindu

Participants

The population is people who know about Posbindu PTM and are over the age of 15 years. The sample in this study was 376 residents, which were chosen using random sampling. This research was conducted on communities targeted by PTM Posbindu in the northern Labuhan Batu Regency, precisely in the Na IX-X district. The reason for choosing the research location is that there is limited research covering North Labuhan Batu Regency, which is quite wide, so it chose one subdistrict, namely Na IX-X District, because the utilization coverage in Na IX-X District, is lower than other districts in the North Labuhan Batu Regency. The Na IX-X subdistrict has two Puskesmas: Puskesmas Aek Kota Batu da Puskesmas Kampung pajak.

Data Collection

Data is collected from respondents using surveys and questionnaires that have gone through the stages of validation by experts and are declared valid and can be used to collect research data. The survey was used to determine the characteristics of respondents such as age, education level, occupation, and utilization of Posbindu. While the questionnaire is used to determine the factors of Posbindu utilization, namely attitudes, behaviors (physical activities), self-motivation, family support, stakeholder support and mileage.

Data analysis

The research variables underwent two analysis processes, namely the univariate analysis, which aims to describe the values of percentages. In contrast, another analysis used is a bivariate analysis to see how the differences of each group of variables affect each other. If the abnormally distributed data is Mann-Whitney, but if the normally distributed data is an unpaired T-Test.

Results

Table 1. presents the distribution of respondents' characteristics, which include variables such as gender, age, education level, occupation, and the utilization of Posbindu PTM services. The table provides an overview of the demographic and social profiles of the respondents involved in the study. The respondents are divided almost equally between male and female participants, reflecting a balanced gender representation. The age distribution highlights three main groups, with a majority of respondents falling within the younger age range. Regarding education, the respondents come from diverse educational backgrounds, ranging from those who have not attended school to those with university-level education, with the largest proportion having completed senior high school.

Table 1. Description of respondents' characteristics

Respondent Characteristic	Total	%
Gender		
Male	182	48.6
Female	194	51.4
Age		
20-34 years old	193	52.9
35-45 years old	56	14.9
>46 years old	121	32.2
Education Level		
Not Attend School	47	12.5
Elementary School	76	20.2
Junior High School	61	16.3
Senior High School	144	38.3
University	48	12.8
Occupation		
Housewife	88	23.4
Labor	57	15.2
Factory employees	66	17.6
Farmer	93	24.7
Civil Servants	36	9.6
Entrepreneur	35	9.3
Private employee	1	0.9
Utilization of Posbindu PTM		
Yes	326	86.7
No	50	13.3

In terms of occupation, the respondents represent various professions, including housewives, laborers, factory employees, farmers, civil servants, entrepreneurs, and private employees, showcasing the diversity in their economic activities. Additionally, the table shows the extent to which respondents utilize Posbindu PTM services, with a significant majority reporting active utilization of these services.

Table 2. Research Variable

Research Variable	Mean	Median	SD	Min	Max
Knowledge	33.51	33.00	5.76	19	50
Attitude	35.41	35.00	6.16	10	50
Behaviour (Physical Activities)	36.80	38.00	7.67	20	50
Family Support	31.17	31.50	3.76	14	35
Stakeholder Support	40.96	44.00	4.60	24	45
Self-Motivation	9.06	10.00	2.37	3	11
Mileage (Km)	2.005	1.00	3.103	30	15

Based on Table 2. In the knowledge variable, a mean value of 33.51, a median value of 33.00, an SD value of 5.76, a minimum value of 19 and a maximum score of 50 were obtained. The attitude variable has a mean value of 35.41, a median value of 35.00, an SD value of 6.16, a minimum score of 10 and a maximum score of 50. The behaviour variable has a mean value of 36.80, a median value of 38.00, an SD value of 7.62, a minimum score of 20 and a maximum score of 50. The family support variable has a mean indigo of 31.17, a median value of 31.50, an SD value of 3.76, a minimum score of 14 and a maximum score of 35.

The stakeholder support variable has a mean value of 40.96, a median value of 44.00, an SD value of 4.60, a minimum score of 24 and a maximum score of 45. The self-motivation variable has a mean value of 9.06, a median value of 10.00, an SD value of 2.37, a minimum value of 3, and a maximum value of 11. Although the mileage variable has a mean value of 2005.81 meters, a median value of 1000 meters, an SD value of 3103.29 meters, with a minimum mileage value of 30 meters and a maximum value of 15 km.

Table 3. Normality test

Normality test	P Value	Ket
Posbindu Utilization Knowledge	0.200	Not Normal
Posbindu Utilization Attitude	0.001	Normal
Posbindu Utilization Behaviour	0.001	Normal
Family Support of Posbindu Utilization	0.0001	Normal
Stakeholder Support of Posbindu Utilization	0.0001	Normal
Self-motivation of Posbindu Utilization	0.0002	Normal
Mileage	0.0001	Normal

Before conducting a statistical analysis test on the variables studied, it is necessary to test the normality of the data to determine the right statistical test. Based on Table 3 of the results of the data normality test above, it was found that knowledge of the use of PTM posbindu has an abnormal data distribution (p-value>0.05), so the knowledge variable is subject to the Mann-Whitney test. Meanwhile, the variables of attitude, behaviour, family support, stakeholder support, self-motivation and mileage have a normal data distribution value characterized by a p-value < 0.05. The Mann-Whitney and unpaired T-test were performed to see the influence difference between the variables studied.

Table 4. Homogeneity Test

Normality test	P Value	Ket
Posbindu Utilization Knowledge	0.0001	Significant
Posbindu Utilization Attitude	0.002	Significant
Posbindu Utilization Behaviour	0.001	Significant
Family Support of Posbindu Utilization	0.001	Significant
Stakeholder Support of Posbindu Utilization*	0.238	Not Significant
Self-motivation of Posbindu Utilization	0.391	Not Significant
Mileage	0.227	Not Significant

Description: No. 1 using Mann-Whitney Test, No. 2-7 using Independent Sample T-Test
Sign if p value <0.05 *Data Variance Values are not Equal

Based on Table 4. The analysis of the research variables found that knowledge variables have a value of 0.0001, attitude variables have a value of 0.002, behavioural variables have a value of 0.001, family support variables have a value of 0.001 (all p values< 0.05) which can be interpreted that knowledge, attitudes, behaviour and family support have a meaningful difference value between the group that uses and those who do not use posbindu PTM. While the analysis results on the stakeholder support variable have a p-value of 0.238, the self-motivation variable has a p-value of 0.391. The mileage variable has a p-value of 0.227 (all p-values> 0.05), which can be interpreted as indicating that there is no meaningful difference between the variables of family support, stakeholder support, self-motivation, and mileage to the posbindu with the responder group that utilizes the posbindu or who do not utilize posbindu.

Discussion

Posbindu Utilization Knowledge

In this study, the knowledge variable had a P value of 0.0001, meaning there is a significant difference in knowledge between the group that utilizes Posbindu PTM Posbindu and those who do not use Posbindu. Factors that influence Posbindu's utilisation include knowledge, family support, social and environmental support, health workers' behaviour, cadres' behaviour and health service facilities (Al-Haroni et al., 2024). If the community's knowledge is lacking, it will reduce the motivation of community activities in utilizing the PTM Posbindu because the community does not know the importance of conducting routine and periodic health checks at the PTM Posbindu even though they have not felt pain. On the other hand, if public knowledge is high, the use of PTM Posbindu will also increase. Knowledge of Posbindu is one factor determining if a person will come to Posbindu. If the public's knowledge about Posbindu is lacking, the community will tend not to take advantage of it because they do not know about Posbindu. This research is in line with Tanjung et al., (2018) stated that knowledge is one factor that influences the use of PTM Posbindu. Elderly who know about the existence of Posbindu, make them live healthier. Because they have gained knowledge about how to live a healthy lifestyle and how to prevent non-communicable diseases.

Posbindu Utilization Attitude

The Attitude Variable has a P value of 0.002, which means there is a significant difference in the attitude of the respondents in the group that uses it compared to the group that does not utilize Posbindu PTM Posbindu. Attitudes have a meaningful relationship with using Posbindu PTM in the working area of the Simpang Tiga Health Center, Bukit District (Rusmiati et al., 2021). Attitude is the most dominant factor in using posbindu compared to other factors (Al-Haroni et al., 2024; Bekele et al., 2024). Respondents with a positive attitude have a 9,758 times greater chance of using Posbindu than respondents with a negative attitude (C. W. M. Sari et al., 2024).

The positive attitude formed towards the posbindu program, especially the inactivity for visits to the posbindu, will encourage a person to participate actively in implementing the posbindu. Attitudes will be difficult to form positively if they are not accompanied by good knowledge about Posbindu PTM.) These characteristics should be reflected in the standards and core components of prevention and rehabilitation programmes (Jennings & Astin, 2017).

Posbindu Utilization Behaviour

The behaviour variable has a p-value of 0.001, which means there is a significant difference in behaviour between the group that utilizes PTM posbindu and those that do not. According to the researcher's assumption, good and positive behaviour is formed if a person already has an attitude and knowledge about something (Machmud et al., 2016; Tesfaye et al., 2021). The higher the understanding of a person's knowledge about Posbindu, the higher the formation of positive behaviour and physical activities (Anita et al., 2016; Zica et al., 2023). Formation and development of individual behaviour, both the physical and socio-psychological environment. Attitude plays a role in influencing health behaviour (Qutishat et al., 2021). The bad lifestyle, such as high consumption of alcohol and tobacco, inappropriate diet, and inadequate physical activity, had raised blood sugar and blood pressure (Jayanna et al., 2019). These correlated strongly with elderly age and poor education.

Self-motivation utilization of Posbindu

The self-motivation variable has a p-value of 0.391, meaning there is no meaningful difference between the self-motivation variable in the Posbindu group and those who do not utilize Posbindu PTM Posbindu. This research is in line with research conducted by Yuniarti et al, which found that respondents who had low motivation to follow the PTM Posbindu almost entirely (97.2%) were not actively participating in the Posbindu PTM (Yuniarti et al., 2021). However, it was still found that 10 respondents (47.6%) had high motivation and were inactive, and there was a significant relationship between motivation and community activity in using Posbindu (Dwisetyo et al., 2020). One of the factors of someone visiting Posbindu is self-motivation to live a healthy life. The elderly with high self-motivation tend to be diligent in visiting Posbindu once a month. They believe that as they get older, many diseases can infect their bodies so they must start learning to adopt a healthy lifestyle.

Community motivation affects the level of activity in using Posbindu and vice versa. If motivation is low, the level of community activity in using Posbindu will also be reduced. In addition, if there are counselling activities that can immediately increase community motivation regarding using PTM Posbindu. The intervention programme is feasible, and can facilitate the development of knowledge, attitudes and practices, with regards to body weight status, physical activity level, nutrition status (BMI and dietary intake), and disordered eating (Al-Haroni et al., 2024).

Family and stakeholder support

Family support variables with a p-value of 0.0001 or a> value of 0.05 can be interpreted as indicating a significant difference between family support variables in groups that use and those that do not use PTM Posbindu. Family support variables with a p-value of 0.0001 or a > value of 0.05 can be interpreted as indicating a significant difference between family support variables in groups that use and those that do not use PTM Posbindu (Dwisetyo et al., 2020). There is an influence between family support with the use of PTM Posbindu (Yuniarti et al., 2021). A meaningful relationship between family support and the use of PTM Posbindu. The odds ratio value is 107,000, which means that low-income family support has a 107-fold chance of not taking advantage of posbindu (Dwisetyo et al., 2020).

This study found no significant differences in stakeholder support in community groups using or not using Posbindu PTM Posbindu (p-value 0.238 or p-value> 0.05). The results of this study are not in line with the results of research by Supriatna et al. in 2020, which found a relationship between stakeholder support and the use of PTM Posbindu. People who receive the support of health workers are 8,273 times more likely to take advantage of the Posbindu PTM compared to people who do not receive support (Supriyatna et al., 2020). The results of research by Sari et al. stated that there is a relationship between the support of health workers and the use of PTM Posbindu in the work area of Puskesmas, Setiabudi District, Jakarta City (D. W. R. Sari & Savitri, 2018). Family is a strong motivator for residents to participate in Posbindu activities if they always provide to accompany, deliver, or remind them of the Posbindu schedule. The existence of family members plays an important role in preventing or at least

preventing people suffering from chronic pain from coming to the Posbindu institution. The role of stakeholders is very important in the community to reduce NCDs (Dzudie et al., 2024).

Family is a strong motivator for residents to participate in posbindu activities if they always provide themselves to accompany, deliver, or remind them of the posbindu schedule. The existence of family members plays an important role in preventing or at least preventing people suffering from chronic pain from coming to the Posbindu institution. Therefore, health workers must provide counselling or health education to families, and it is hoped that this will also increase family knowledge and awareness about the importance of participation in Posbindu (Indriani et al., 2018; Noviati, 2021). In addition, stakeholders also have an important role in increasing the community's motivation to use the Posbindu PTM Posbindu. Community engagement and awareness-raising are needed to maximize population impact on health outcomes (Bekele et al., 2024; Dodd et al., 2019; Tesfaye et al., 2021). Stakeholder support is very important in advocating, coordinating, and procuring facilities and infrastructure for PTM Posbindu that can be well implemented by PTM Posbindu activities in the local area.

Posbindu Mileage

The mileage variable has a p-value of 0.227 (p-value> 0.05), which can be interpreted to mean that there is no meaningful difference between the distance variable travelled to Posbindu and the community group that uses or does not use Posbindu. The results of this study are different from the research of Rusmiati et al. in 2021, which found that there is a relationship between mileage and the use of PTM Posbindu; it is known based on the results of the chi-square test, shows that the p-value = 0.003 which proves that the mileage has a meaningful relationship with the use of PTM Posbindu in the Simpang Tiga Health Center Working Area, Bukit District (Rusmiati et al., 2021). Accessibility is one of the factors that plays an important role in the use of health services, which is assessed by distance, travel time, and availability of transportation to reach health service locations (Kadariya et al., 2023; Musoke et al., 2021).

Conclusions

Based on the analysis results, it can be concluded that the results of the Mann-Whitney statistical test on the knowledge variable obtained a p-value < 0.05, which stated that there was a significant difference in the knowledge of the group of respondents who used and who did not use PTM Posbindu. The results of the independent T-test statistical test on attitude variables, behaviour variables, -and family support variables have a p-value <0.05, which can be interpreted as indicating that there is no meaningful difference between family support variables, between the response groups that utilize posbindu and those who do not utilize posbindu. Independent statistical test results The sample of the T-test on stakeholder support variables, self-motivation variables, and mileage variables also had a value of p > 0.05, which means that there are no significant differences in stakeholder support, self-motivation, and mileage between the groups of respondents who use and who do not use PTM posbindu. The elderly who know about the existence of Posbindu, make them live healthier. Because they have gained knowledge about how to live a healthy lifestyle and how to prevent non-communicable diseases. They believe that as they get older, many diseases can infect their bodies so they must start learning to adopt a healthy lifestyle.

References

Abdul-Mutalib, N. A., Abdul-Rashid, M. F., Mustafa, S., Amin-Nordin, S., Hamat, R. A., & Osman, M. (2012). Knowledge, attitude and practices regarding food hygiene and sanitation of food handlers in Kuala Pilah, Malaysia. *Food Control*, *27*(2), 289–293. https://doi.org/10.1016/j.foodcont.2012.04.001

Al-Haroni, H., Nik Farid, N. D., & Azanan, M. S. (2024). Effectiveness of education intervention, with regards to physical activity level and a healthy diet, among Middle Eastern adolescents in Malaysia: A study protocol for a randomized control trial, based on a health belief model. *PLoS ONE*, *19*(1 January). https://doi.org/10.1371/journal.pone.0289937

Anita, B., Febriawati, H., & Yandrizal, Y. (2016). The Role of Public Health Centers (Puskesmas) as the Gatekeeper of National Health Insurance. *Jurnal Kesehatan Masyarakat*, *12*(1). https://doi.org/10.15294/kemas.v12i1.3933

Bekele, A., Alem, A., Seward, N., Eshetu, T., Gebremariam, T. H., Getachew, Y., Mengiste, W., Medhin, G., Fairall, L., Sevdalis, N., Prince, M., Fekadu, A., & Hanlon, C. (2024). Barriers and enablers to improving integrated primary healthcare for non-communicable diseases and mental health conditions in Ethiopia: a mixed methods study. *BMC Primary Care*, *25*(1), 211. https://doi.org/10.1186/s12875-024-02458-6

Bengan, F., Nulhakim, L., & Tini, T. (2022). Factors Related to The Utilization of The Integrated Development Posts of Non-Convenient Diseases in The Pandemic Era in The Work Area of Sekolaq Health Centre in 2022. *KESANS : International Journal of Health and Science*, *2*(2), 98–112. https://doi.org/10.54543/kesans.v2i2.165

Dodd, R., Palagyi, A., Jan, S., Abdel-All, M., Nambiar, D., Madhira, P., Balane, C., Tian, M., Joshi, R., Abimbola, S., & Peiris, D. (2019). Organisation of primary health care systems in low- and middle-income countries: review of evidence on what works and why in the Asia-Pacific region. *BMJ Global Health*, *4*(Suppl 8), e001487. https://doi.org/10.1136/bmjgh-2019-001487

Duma, K., Bahktiar, R., Fitriany, E., Weraman, P., & Maria, I. L. (2024). Prevention and Control of Non-Communicable Diseases (NCDs) Through Integrated development Posts (Posbindu) on Campus. *South Eastern European Journal of Public Health*, 2764–2771. https://doi.org/10.70135/seejph.vi.2534

Dwisetyo, B., Mulyono, S., & Khasanah, U. (2020). Pengaruh Peran Kader dan Dukungan Keluarga dengan Pemanfaatan Pos Pembinaan Terpadu Penyakit Tidak Menular. *Jurnal Ilmiah Kesehatan Pencerah*, *09*(2), 81–86.

Dzudie, A., Dehayem, M., Kuate, L. M., Ndom, M. S., Ouankou, C. N., Ebasone, P. V., Ngongang, A. D., Njume, E., Kamdem, F., Choukem, S. P., Essomba, N. E., Ateudjieu, J., Folefack, F. K., Obada, E. N., Nono, A., Kitio, B., Tchendjou, P., Thienemann, F., Boombhi, J., … Mbanya, J. C. (2024). Ten Recommendations for Accelerating Hypertension and Diabetes Control to Reduce Stroke, Heart, and Renal Disease with the Aim to Save Lives in Cameroon Through Partnerships and Collaborations. *Advances in Therapy*, *41*(11), 3996–4007. https://doi.org/10.1007/s12325-024-02960-4

Indriani, R. A., Zulfendri, Z., & Utama, S. (2018). Pengaruh Karakteristik Organisasi Terhadap Pemanfaatan Pos Pembinaan Terpadu Penyakit Tidak Menular (Posbindu PTM) di Wilayah Puskesmas Helvetia Medan. *Berita Kedokteran Masyarakat*, 15. https://doi.org/10.22146/bkm.35600

Jayanna, K., Swaroop, N., Kar, A., Ramanaik, S., Pati, M. K., Pujar, A., Rai, P., Chitrapu, S., Patil, G., Aggarwal, P., Saksena, S., Madegowda, H., Rekha, S., & Mohan, H. L. (2019). Designing a comprehensive Non-Communicable Diseases (NCD) programme for hypertension and diabetes at primary health care level: evidence and experience from urban Karnataka, South India. *BMC Public Health*, *19*(1), 409. https://doi.org/10.1186/s12889-019-6735-z

Jennings, C., & Astin, F. (2017). A multidisciplinary approach to prevention. *European Journal of Preventive Cardiology*, *24*(3_suppl), 77–87. https://doi.org/10.1177/2047487317709118

Kadariya, S., Ball, L., Chua, D., Ryding, H., Hobby, J., Marsh, J., Bartrim, K., Mitchell, L., & Parkinson, J. (2023). Community Organising Frameworks, Models, and Processes to Improve Health: A Systematic Scoping Review. *International Journal of Environmental Research and Public Health*, *20*(7), 5341. https://doi.org/10.3390/ijerph20075341

Kamada, M., Kitayuguchi, J., Abe, T., Taguri, M., Inoue, S., Ishikawa, Y., Harada, K., Lee, I.-M., Bauman, A., & Miyachi, M. (2015). Community-wide promotion of physical activity in middle-aged and older Japanese: a 3-year evaluation of a cluster randomized trial. *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 82. https://doi.org/10.1186/s12966-015-0242-0

Korcz, A., Cieśla, E., & Urbański, P. (2024). The role of school functioning, physical activity, BMI, sex and age in building resilience among Ukrainian refugee children in Poland. *Scientific Reports*, *14*(1). https://doi.org/10.1038/s41598-024-55933-6

Machmud, R., Noer, M., Indrawati Lipoeto, N., Rahajeng, E., & Kodrat Pramudho, P. A. (2016). The Empowerment of Integrated Development Post of Non-communicable Diseases in Efforts to Prevent Non-communicable Diseases. In *International Journal of Public Health Science (IJPHS)* (Vol. 5, Issue 3).

Mashdariyah, A., & Rukanah, R. (2019). Peran Masyarakat Dalam Kegiatan POSBINDU PTM Di Kelurahan Lumpur Kabupaten Gresik Tahun 2019. *Jurnal Kebidanan Midwiferia*, *5*(2), 1–11. https://doi.org/10.21070/mid.v5i2.2767

Musoke, D., Atusingwize, E., Ikhile, D., Nalinya, S., Ssemugabo, C., Lubega, G. B., Omodara, D., Ndejjo, R., & Gibson, L. (2021). Community health workers' involvement in the prevention and control of non-communicable diseases in Wakiso District, Uganda. *Globalization and Health*, *17*(1), 1–11. https://doi.org/10.1186/s12992-020-00653-5

Noviati, E. (2021). Faktor yang Mempengaruhi Pemanfaatn Pos Pembinaan Terpadu Penyakit Tidak Menular (Posbindu PTM). *Jurnal Kesehatan STIKes Muhammadiyah Ciamis*, *7*(2), 8–15. https://doi.org/10.52221/jurkes.v7i2.62

Nugraheni, W. P., & Hartono, R. K. (2018). Strategi Penguatan Program Posbindu Penyakit Tidak Menular di Kota Bogor. *Jurnal Ilmu Kesehatan Masyarakat*, *9*(3), 198–206. https://doi.org/10.26553/jikm.2018.9.3

Oktarianita, O., Wati, N., Febriawati, H., & Afriyanto, A. (2020). An Analysis on the Implementation of Posbindu PTM Program at Beringin Raya Community Health Center Bengkulu. *Disease Prevention and Public Health Journal*, *15*(1), 1. https://doi.org/10.12928/dpphj.v15i1.2841

Poniasih, A., Sunarti, S., Sulistyawati, S., & Rokhmayanti, R. (2024). Description of non-communicable diseases and risk factors related to lifestyle among POSBINDU (Integrated Guidance Posts) participants in Yogyakarta in 2022. *Jurnal Cakrawala Promkes*, *6*(1), 22–27. https://doi.org/10.12928/jcp.v6i1.8740

Qutishat, D., Muhaidat, J., Mohammad, M., Okasheh, R., Al-Khlaifat, L., & Al-Yahya, E. (2021). Exploring attitudes of physiotherapy students towards a community-based project used as a learning tool. *Physiotherapy Theory and Practice*, *37*(1), 115–125. https://doi.org/10.1080/09593985.2019.1619209

Rusmiati, Hidayat, W., & Silitongga, E. (2021). Faktor-Faktor yang Berhubungan dengan Pemanfaatan Pos Pelayanan Terpadu (Posbindu) Penyakit Tidak Menular di Wilayah Kerja Puskesmas Simpang Tiga Kecamatan Bukit Kabupaten Bener Meriah. *Journal of Healthcare Technology and Medicine*, *7*(2).

Sari, C. W. M., Khoeriyah, V. N., & Lukman, M. (2024). Factors Related to The Utilization of Integration Health Program (Posbindu) Among Older Adults in Indonesia: A Scoping Review. In *Clinical Interventions in Aging* (Vol. 19, pp. 1361–1370). Dove Medical Press Ltd. https://doi.org/10.2147/CIA.S462621

Sari, D. W. R., & Savitri, M. (2018). Faktor-Faktor yang Berhubungan dengan Pemanfaatan Posbindu Penyakit Tidak Menular (PTM) di Wilayah Kerja Puskesmas Kecamatan Setiabudi Kota Jakarta Selatan Tahun 2018. *Jurnal Kebijakan Kesehatan Indonesia: JKKI*, *07*(02), 49–56.

Sudharma, N. I., Kusumaratna, R. K., & Meiyanti. (2016). Factors Influence The Utilization Of Community Participation (POSBINDU). *OIDA International Journal of Sustainable Development, Ontario International Development*, *09*(03). http://www.ssrn.com/link/OIDA-Intl-Journal-Sustainable-Dev.html

Supriyatna, E., Pertiwiwati, E., & Setiawan, H. (2020). Program Pos Pembinaan Terapdu Penyakit Tidak Menular di Puskesmas Martapura 2. *Jurnal Publikasi Kesehatan Masyarakat Indonesia*, *7*(1), 1. https://doi.org/10.20527/jpkmi.v7i1.8786

Tanjung, W. W., Harahap, Y. W., & Panggabean, M. S. (2018). Faktor-Faktor yang Mempengaruhi Pemanfaatan Program Pos Pembinaan Terpadu Penyakit Tidak Menular di Wilayah Kerja Puskesmas Batang Toru KabupatenTapanuli Selatan Tahun 2017. *Jurnal Kesehatan Ilimiah Indonesia*, *3*(2), 92–108.

Tesfaye, A., Semrau, M., Ali, O., Kinfe, M., Tamiru, M., Fekadu, A., & Davey, G. (2021). Development of an integrated, holistic care package for people with lymphoedema for use at the level of the Primary Health Care Unit in Ethiopia. *PLOS Neglected Tropical Diseases*, *15*(4), e0009332. https://doi.org/10.1371/journal.pntd.0009332

Van Hout, M.-C., Akugizibwe, M., Shayo, E. H., Namulundu, M., Kasujja, F. X., Namakoola, I., Birungi, J., Okebe, J., Murdoch, J., Mfinanga, S. G., & Jaffar, S. (2024). Decentralising chronic disease management in sub-Saharan Africa: a protocol for the qualitative process evaluation of community-based integrated management of HIV, diabetes and hypertension in Tanzania and Uganda. *BMJ Open*, *14*(3), e078044. https://doi.org/10.1136/bmjopen-2023-078044

Watson, E. D., Moosa, S., Janse Van Rensburg, D. C., Schwellnus, M., Lambert, E. V., & Stoutenberg, M.

(2023). Task-Shifting: Can Community Health Workers Be Part of the Solution to an Inactive Nation? *International Journal of Environmental Research and Public Health*, *20*(17), 6675. https://doi.org/10.3390/ijerph20176675

Yuniarti, A. M., Fardiansyah, A., & Putri, S. W. (2021). Motivasi Dan Dukungan Keluarga Dengan Keaktifan Masyarakat Mengikuti Program Posbindu PTM. *Indonesian Journal of Professional Nursing*, *2*(1), 22. https://doi.org/10.30587/ijpn.v2i1.2954

Zica, M. M., Maciel, E. da S., Quaresma, F. R. P., Barbosa, T. C., Silva, B. K. R., Sousa, L. V. de A., Pontes-Silva, A., & Adami, F. (2023). Physical activity and body composition in a Quilombola community in the Tocantins state (Brazil). *Retos*, *49*, 394–400. https://doi.org/10.47197/retos.v49.95812

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