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Longitudinal Study of the Effect of Clean and Healthy Living Behaviour (PHBS) on the Incidence of Communicable Diseases in Urban Environments

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ABSTRACT
The aim of this study was to evaluate the long-term impact of Clean and Healthy Living Behavior (PHBS) implementation on the incidence of infectious diseases in urban environments. Methods. This study used a quantitative approach with a longitudinal study design. Data collection was conducted through a validated questionnaire survey, direct observation, and in-depth interviews with respondents. Data analysis was conducted using inferential statistical methods, including logistic regression to identify the association between PHBS categories and disease incidence. Results. Overall, 31.7% of respondents experienced at least one type of infectious disease during the study period. ARI was the most common infectious disease (18.3%), followed by diarrhoea (6.7%), dengue haemorrhagic fever (DBD) (4.2%), and tinea (2.5%). The results of bivariate analysis and logistic regression revealed that there was a significant relationship between the implementation of clean and healthy living behavior and the incidence (p = 0.001). Response to infectious diseases was 70% lower in the group with good compared to those with poor (OR = 0.30; p = 0.0.001). Conclusions. The implementation of good clean living behavior can significantly reduce the risk of infections in urban environment.

Keywords: *Clean and Healthy Living Behaviour, Incidence of Infectious Diseases, Socio-Economic*

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INTRODUCTION

Infectious diseases continue to be a major health challenge in urban environments. High population density, massive mobility, and lack of awareness of individual sanitation and hygiene contribute to the increasing incidence of infectious diseases such as diarrhoea, acute respiratory infections (ARI), tuberculosis (TB), and dengue hemorrhagic fever (DHF) (Lolan et al., 2024). Behaviour-based prevention efforts such as Clean and Healthy Living Behaviour (PHBS) are key in reducing the risk of disease spread in urban areas (Pitriani et al., 2024).

Recent statistics show that the incidence of infectious diseases remains high in many cities. In Indonesia, childhood diarrhoea cases increased from 4.5% in 2013 to 6.8% in 2018 (Lolan et al., 2024). Risk factors such as poor access to sanitation, inadequate drinking water and poor hygiene behaviour are the main causes of the increase in infectious disease incidence. However, the limited number of longitudinal studies evaluating the long-term impact of PHBS implementation on infectious disease incidence makes this topic important for further study (Shalshabilla et al., 2023).

PHBS covers various aspects of daily life that contribute to public health. Some of the main indicators of PHBS include handwashing with soap, use of clean water, utilisation of healthy latrines, eradication of mosquito larvae, and consumption of healthy food (Azhar et al., 2023). The implementation of PHBS is not only the responsibility of individuals but also requires community involvement and government policies that support these healthy behaviours in urban environments (Wardani et al., 2023).

Infectious diseases such as dengue and ARI are commonly found in big cities due to environmental conditions that favour the proliferation of disease vectors and the spread of viruses through high social interaction (Natassa et al., 2022). Environmental factors such as poor sanitation, settlement density, and low air quality exacerbate these conditions. Therefore, understanding the role of PHBS in preventing infectious diseases is crucial for urban public health (Indhillah et al., 2023).

The longitudinal research approach is very relevant in examining the relationship between PHBS and the incidence of infectious diseases. Longitudinal studies allow monitoring of behaviour change and its impact over a longer period of time, thus providing stronger evidence of the effectiveness of PHBS in reducing the incidence of infectious diseases (Aswita, 2023). The results of this study can be the basis for designing more effective health interventions (Rusiana et al., 2022). The aim of this study was to evaluate the long-term impact of PHBS implementation on the incidence of infectious diseases in urban environments. By understanding the relationship between these two variables, this study can provide insights for policy makers in designing more effective and evidence-based health programmes (Purba & Gusar, 2020).

The benefits of this research cover various aspects, from increasing public awareness of the importance of PHBS, to developing better health policies based on the results of scientific research. For health workers, the results of this study can be used as a guide in developing more effective public health education and promotion strategies (Pangestuti, 2021).

METHODS

This study used a quantitative approach with a longitudinal study design to evaluate the continuity of the influence of Clean and Healthy Living Behaviour (PHBS) on the incidence of infectious diseases in urban environments. The population in this study was urban communities spread across several areas with different socioeconomic characteristics. The study population was set at 10,000 individuals from five urban areas with varying socioeconomic levels. The research sample was selected using stratified random sampling method to ensure a balanced representation of various social groups. Based on the sample size calculation considering a 5% margin of error, a sample size of 600 respondents was obtained, each of which was proportionally divided based on low, middle and high socio-economic categories. Data collection was conducted through a validated questionnaire survey, direct observation, and in-depth interviews with respondents. In addition, secondary data from public health reports and medical records will be used to strengthen the analysis. Monitoring was conducted for 24 months with periodic measurements every 6 months to evaluate changes in PHBS patterns and incidence of infectious diseases in the studied population.

Data analysis is conducted using inferential statistical methods, including logistic regression to identify the association between the independent variable (PHBS) and the dependent variable (infectious disease incidence), as well as the chi-square test to test the significance of the association between PHBS categories and disease incidence. In addition, trend analysis will be applied to evaluate changes in infectious disease patterns throughout the study period. The results of this study are expected to provide in-depth insights into the effectiveness of PHBS in the prevention of infectious diseases as well as a basis for the development of better public health policies in urban environments.

RESULTS

1. Respondent Characteristics

Univariate analysis was conducted to describe the distribution of respondent characteristics in this study. Table 1 presents the distribution of respondents based on gender, age, socioeconomic level, Clean and Healthy Living Behavior (PHBS) status, and the incidence of infectious diseases studied, namely Acute Respiratory Tract Infection (ARI), diarrhea, dengue fever (DBD), and tinea (fungal skin infection).

Table 1. Distribution of Respondent Characteristics

Respondent Characteristics	Frequency (n)	Percentage (%)
Gender		
Man	280	46.7%
Woman	320	53.3%
Age (Years)		
18 – 30	150	25.0%
31 – 45	220	36.7%

46 – 60	160	26.7%
> 60	70	11.7%
Socioeconomic Level		
Low	200	33.3%
Intermediate	250	41.7%
Tall	150	25.0%
PHBS Status		
Good	320	53.3%
Not good	280	46.7%
Infectious disease occurrence		
ISPA	110	18.3%
Diarrhea	40	6.7%
dengue fever	25	4.2%
Tinea	15	2.5%
Total incidence of infectious diseases	**190**	**31.7%**

From the results of univariate analysis, the majority of respondents in this study were women (53.3%) with the largest age group in the range of 31-45 years (36.7%). Based on socio-economic level, most respondents came from the middle group (41.7%). As many as 53.3% of respondents had good PHBS, while 46.7% had poor PHBS. Regarding the incidence of infectious diseases, ISPA was the most common disease found (18.3%), followed by diarrhea (6.7%), DHF (4.2%), and tinea (2.5%). Overall, 31.7% of respondents experienced at least one type of infectious disease during the study period.

2. Relationship Between PHBS and Infectious Disease Incidence (Bivariate Analysis)

Bivariate analysis was conducted to see the relationship between PHBS and the incidence of infectious diseases studied, namely ARI, diarrhea, DHF, and tinea (fungal skin infection).

Table 2. Relationship Between PHBS and Infectious Disease Incidence

PHBS Status	ISPA (n/%)	Diarrhea (n/%)	DBD (n/%)	Tinea (n/%)	Total Diseases (n/%)	p-value
Good	30 (9.4%)	10 (3.1%)	5 (1.6%)	5 (1.6%)	50 (15.6%)	
Not good	80 (28.6%)	30 (10.7%)	20 (7.1%)	10 (3.6%)	140 (50.0%)	0.001
Total	110 (18.3%)	40 (6.7%)	25 (4.2%)	15 (2.5%)	1901.7%)	

The results of the analysis showed that respondents with good PHBS had a much lower incidence of infectious diseases compared to those with poor PHBS. Of the respondents with good PHBS, only 9.4% experienced ARI, 3.1% experienced diarrhea, 1.6% experienced DHF, and 1.6% experienced tinea. In contrast, in respondents with poor PHBS, the incidence of disease was much higher: 28.6% experienced ARI, 10.7% experienced diarrhea, 7.1% experienced DHF, and 3.6% experienced tinea. The chi-square test shows that the relationship between PHBS and the incidence

of infectious diseases is significant (p = 0.001), which means that good PHBS is closely related to a reduced risk of infectious diseases.

3. Logistic Regression Analysis: The Effect of PHBS on the Incidence of Infectious Diseases

Logistic regression analysis was conducted to assess the influence of PHBS on the incidence of infectious diseases, taking into account age and socioeconomic factors.

Table 3. Results of Logistic Regression Analysis

Variables	OR (95% CI)	p-value
Good PHBS	0.30 (0.18 – 0.52)	0.001
Age > 45 years	1.60 (1.05 – 2.44)	0.028
Low Socioeconomic	1.75 (1.12 – 2.73)	0.015

Respondents with good PHBS had a 70% lower chance of experiencing infectious diseases compared to those with poor PHBS (OR = 0.30; p = 0.001). Age over 45 years increased the risk of contracting infectious diseases by 60% compared to younger age groups (OR = 1.60; p = 0.028). Respondents from low socioeconomic groups had a 75% higher chance of experiencing infectious diseases compared to middle and high socioeconomic groups (OR = 1.75; p = 0.015). These results indicate that in addition to PHBS, age and socio-economic conditions also play an important role in increasing the risk of infectious diseases, especially ARI, diarrhea, dengue fever and tinea.

DISCUSSION

The results of the study showed that there was a significant relationship between Clean and Healthy Living Behavior (PHBS) and the incidence of infectious diseases such as ARI, diarrhea, DHF, and tinea (p = 0.001). Respondents with good PHBS had a much lower incidence of disease compared to those with poor PHBS. Of the respondents with good PHBS, only 15.6% experienced infectious diseases, while in respondents with poor PHBS, the incidence reached 50%. Logistic regression analysis also showed that individuals with good PHBS had a 70% lower chance of experiencing infectious diseases compared to individuals with poor PHBS (OR = 0.30; p = 0.001). Age and socioeconomic status factors were also found to contribute to the increased risk of infectious diseases, with the age group over 45 years having a 60% higher risk (OR = 1.60; p = 0.028), and the low socioeconomic group having a 75% higher risk (OR = 1.75; p = 0.015).

1. Acute Respiratory Tract Infection (ARI)

The results showed that ARI was the most common infectious disease among respondents. Respondents with poor PHBS had a higher incidence of ARI (28.6%) compared to those with good PHBS (9.4%). Public health theory states that ARI is often associated with poor environmental hygiene and irregular handwashing habits. In addition, age factors and exposure to air pollution also play a role in increasing the risk of ARI.

ISPA is one of the environmental-based diseases that commonly occurs in the community, especially in areas with inadequate sanitation conditions. This disease is caused by various factors, including air pollution, poor environmental hygiene, and lack of implementation of Clean and

Healthy Living Behavior (PHBS) among the community. A study conducted by Rina et al. (2023) showed that increasing public awareness of the importance of maintaining environmental cleanliness can contribute significantly to reducing the incidence of ISPA. Therefore, education efforts and improving sanitation need to be increased to prevent the spread of this disease (Rina et al., 2023).

ISPA is more common in individuals who have a habit of not washing their hands before eating or after doing activities outside the home. Lack of good ventilation in the home also increases the risk of spreading viruses and bacteria that cause ISPA. Therefore, researchers assume that increasing awareness of personal and environmental hygiene can be an important step in preventing this disease.

In addition, smoking habits in the home and exposure to smoke from household fuels are also factors that worsen the incidence of ARI. If the community has better access to health information and implements proper hygiene practices, the incidence of ARI can be reduced significantly. Health promotion campaigns related to indoor air cleanliness, the use of masks when sick, and the habit of washing hands before eating and after coughing.

2. Diarrhea

Diarrhea is the second most common infectious disease found in this study. Respondents with poor PHBS had a higher prevalence of diarrhea (10.7%) compared to those with good PHBS (3.1%). The main cause of diarrhea is often related to consumption of contaminated water and poor hand washing habits.

Diarrhea is one of the diseases that often occurs due to poor environmental hygiene conditions, including inadequate sanitation and limited access to clean water. Research conducted by Rahmad and Nurwahidah (2022) shows that the implementation of good Clean and Healthy Living Behavior (PHBS), such as washing hands with soap and using clean water, can significantly reduce the incidence of diarrhea. In addition, public education through counseling on PHBS has proven effective in increasing knowledge and changing community behavior in efforts to prevent diarrhea. Therefore, interventions that focus on increasing public awareness of the importance of cleanliness and sanitation are needed to reduce the risk of spreading this disease (Rahmad & Nurwahidah, 2022).

Diarrhea is closely related to access to clean water sources and proper sanitation systems. Researchers assume that the lack of sanitation facilities and food hygiene contribute to the high incidence of diarrhea among respondents with poor PHBS. If the community has better access to clean water and implements the habit of washing hands with soap, the incidence of diarrhea can be reduced significantly.

In addition, education factors also affect the incidence of diarrhea. Individuals with a lower level of understanding of the importance of cleanliness often ignore hygienic practices. Therefore, interventions in the form of education on drinking water treatment and food hygiene are needed. Counseling on the importance of washing hands with soap, using clean water for consumption, and hygienic food processing.

3. Dengue Hemorrhagic Fever (DF)

The prevalence of DHF in this study was higher in the group with poor PHBS (7.1%) compared to the group with good PHBS (1.6%). The spread of DHF is related to environmental cleanliness and the presence of Aedes aegypti mosquito breeding sites. Previous studies have shown that mosquito nest eradication (PSN) is the most effective method in suppressing DHF cases.

Dengue Hemorrhagic Fever (DHF) is a disease caused by the dengue virus and transmitted through the bite of the Aedes aegypti mosquito. The incidence of this disease tends to increase in areas with poor sanitation and irregular waste disposal behavior. Research conducted by Nanda et al. (2024) shows that community behavior in eradicating mosquito nests, such as cleaning water reservoirs and disposing of garbage properly, has a direct relationship with a decrease in DHF cases. Therefore, public awareness and the implementation of sustainable preventive measures are crucial factors in reducing the risk of transmission of this disease (Nanda et al., 2024).

Researchers assume that the habit of letting water pool and lack of awareness in conducting PSN are the main factors in the spread of DHF. If the community is more active in draining and closing water reservoirs, then the development of mosquitoes can be prevented.

In addition, public awareness in using mosquito nets and insecticides is still low. If education about the importance of preventing mosquito bites through the use of mosquito repellent lotion and the installation of mosquito nets is increased, the incidence of DHF can decrease drastically. Increased PSN activities in the community through the 3M program (Draining, Closing, and Recycling) and periodic spraying of insecticides.

4. Tinea (Fungal Skin Infection)

Fungal skin infections (tinea) were found in respondents with poor PHBS (3.6%) compared to good PHBS (1.6%). This disease is often associated with poor personal hygiene and high humidity in the living environment. One of the main factors causing the high incidence of tinea is the lack of public knowledge about how to maintain personal and environmental hygiene. Many individuals are unaware of the importance of maintaining skin and clothing hygiene, which can lead to fungal infections. Research by Maulidian & Linggardini, 2022 at Zam-Zam Islamic Boarding School Cilongok showed that many students do not know how to maintain good hygiene, such as washing their hands and keeping their clothes clean, which has the potential to increase the risk of fungal skin infections (Maulidian & Linggardini, 2022).

Fungal skin infections are more common in individuals who do not maintain good hygiene and are often in humid environments. Researchers assume that the habit of not drying the body properly after bathing and wearing clothes that do not absorb sweat increases the risk of fungal infections. In addition, sharing towels or clothes with others who are already infected is also a factor in the spread of tinea. If awareness of personal hygiene increases and people are more selective in choosing appropriate clothing, then the incidence of tinea can be reduced. Education and counseling on clean and healthy living behavior (PHBS) are very important in preventing tinea. Through effective education programs, the public can be given the right information on how to maintain personal and environmental hygiene, as well as the importance of preventive measures to avoid

fungal infections. The use of educational media, such as videos and posters, can increase public understanding of tinea and how to prevent it.

CONCLUSIONS

Based on the results of the study, it can be concluded that Clean and Healthy Living Behaviour (PHBS) has a significant relationship with the incidence of infectious diseases in urban environments. Respondents who implemented good PHBS had a lower incidence of infectious diseases compared to those who had poor PHBS.

This study showed that ARI was the most common infectious disease (18.3%), followed by diarrhoea (6.7%), dengue haemorrhagic fever (DBD) (4.2%), and tinea (2.5%). The results of bivariate analysis and logistic regression revealed that the implementation of good PHBS can significantly reduce the risk of infectious diseases. Respondents with good PHBS had a 70% lower chance of experiencing infectious diseases compared to those with poor PHBS (OR = 0.30; p = 0.001). In addition, age above 45 years (OR = 1.60; p = 0.028) and low socioeconomic level (OR = 1.75; p = 0.015) were also found to contribute to the increased risk of infectious diseases.

In particular, lack of environmental hygiene and inadequate sanitation contribute to the increased incidence of ARI and diarrhoea. Irregular garbage disposal and lack of awareness in eradicating mosquito nests exacerbate the spread of dengue, while tinea is more prevalent in individuals with poor personal hygiene. Therefore, increased public awareness and education on PHBS is needed to reduce the risk of infectious diseases in urban areas.

The results of this study confirm that PHBS should be prioritised in infectious disease prevention strategies. Therefore, policy-based interventions that support the implementation of PHBS are needed, including improved access to clean water, proper sanitation, and health education campaigns. With the active role of the community, health workers, and government, it is expected that the incidence of infectious diseases can be minimised, thereby improving the quality of public health in urban environments.

REFERENCES

Aswita, R. (2023). The Effect of Health Promotion Strategies on the Level of Clean and Healthy Living Behavior (PHBS) in Household Settings in Penanggalan Sub-district of Subulussalam. Journal of Complementary and Alternative Medical Research, 22(2). https://journaljocamr.com/index.php/JOCAMR/article/view/453

Azhar, F., Seni, W., & Sarnika, W. (2023). Determinants Of Clean And Healthy Living Behavior (Phbs) On Family Latrine Ownership In Ranto Sabun Village, Pante Purba Settlement, Sampoiniet Sub-District, Aceh Jaya District In 2023/2024. Transpublika International Research In Exact Sciences, 2(4), 117–122. https://doi.org/10.55047/tires.v2i4.1220

Indhillah, P. A. W., Raksanagara, A. S., & Gondodiputro, S. (2023). Relationship between Clean, Healthy Living Behavior, and COVID-19 Infection at the Parigi Public Health Center, West Java, Indonesia. Althea Medical Journal, 10(2). https://doi.org/10.15850/amj.v10n2.2715

Lolan, Y. P., Firdaus, R., Kurniawati, R. D., & Suherdin . (2024). Differences in Students' Knowledge and Attitudes when Given Media, Games, Esedalu, and Videos on Healthy Clean Living Behavior in State Elementary School 146 Gumuruh, Bandung City. PROMOTOR, 7(4), 481–489. https://doi.org/10.32832/pro.v7i4.735

Maulidian, K., & Linggardini, K. (2022). The Effect of Health Education with PHBS Media on the Knowledge Level of Santri Pondok Zam-Zam Islamic Boarding School, Cilongok. Proceedings Series on Health & Medical Sciences, 2(1). https://doi.org/10.30595/pshms.v2i.242

Nanda, M., Munthie, N. U., Nasution, N., Hasibuan, R., Aisyah, S., & Wulandari, T. (2024). The Relationship of Clean and Healthy School Living Behavior and the Incidence of Dengue Fever in Students of SMPN 1 Pancur Batu, Deli Serdang. Jurnal Mahasiswa Kesehatan Masyarakat, 7(3), 333–337. https://doi.org/10.32832/pro

Natassa, S. E., Siregar, D., & Armidin, R. P. (2022). Habitation of Clean and Healthy Living Behavior in Preventing COVID-19 AT AL-Husna Marindal Islamic Boarding School. ABDIMAS TALENTA Journal of Community Service, 7(2), 483–490. https://doi.org/10.32734/abdimastalenta.v7i2.7743

Pangestuti. (2021). Improving clean and healthy living behavior (PHBS) in children aged 4-5 years through storytelling methods. Action Research Journal, 1(1), 108–114. https://doi.org/10.51651/arj.v1i1.82

Pitriani, Hayati, K., Kesumawardani, N. U., & Sitepu, A. L. (2024). Education of Clean and Healthy Living Behaviors for Students of UPT SPF SD Negeri 101900 Lubuk Pakam. JURNAL PENGMAS KESTRA (JPK), 4(1), 62–66. https://doi.org/10.35451/jpk.v4i1.2185

Purba, N., & Gusar, M. R. S. (2020). Clean and Healthy Lifestyle Behavior (PHBS Program) for Children with Intellectual Disability. JPUD - Jurnal Pendidikan Usia Dini, 14(2), 275–287. https://doi.org/10.21009/jpud.142.06

Rahmad, I., & Nurwahidah. (2022). The Effect of Counseling on Clean and Healthy Living Behavior (PHBS) on Community Behavior to Prevent Diarrhea. Journal of Mathematics and Science Studies and Learning IKIP Mataram, 10(2). https://doi.org/10.33394/j-ps.v10i2.4939

Rina, W., Batmomolin, A., & Kelabora, J. (2023). Portrait of Environmental Health Improvement for Environmentally Based Disease Prevention in Ngayub Village, Southeast Maluku Regency. Journal of Community Service, 3(1), 38–44. https://doi.org/10.54259/pakmas.v3i1.1631

Rusiana, H. P., Hidayati, B. N., Nur, D., Romadonika, F., Ilham, & Syafitri, R. P. (2022). Implementation of Clean and Healthy Living Behavior (PHBS) in Families in Kr. Raden Tanjung Hamlet. Immanuel Health Science Journal, 15(2), 65–73. https://doi.org/10.36051/jiki.v15i2.167

Shalshabilla, A. T., Mukhtarudin, K. A. H., Pamudji, R., Ghiffari, A., Tusadiah, H., Antoni, A., Kurniatullah, R., Prayoga, R., & Muchsiri, M. (2023). Clean And Healthy Lifestyle Behavior Education Program to Improve Personal Hygiene in Elementary School. Empowered Indonesia, 4(4), 1271–1276. https://doi.org/10.47679/ib.2023544

Wardani, N. P. E., Kamila, N., Febrianti, N. V., & Yunanto, R. A. (2023). Improving the Clean and Healthy Living Behavior of Adolescents in Rural Areas of Indonesia: An Educational

Intervention Program. Health and Technology Journal (HTechJ), 1(5), 558–566. https://doi.org/10.53713/htechj.v1i5.118