

The Influence of Personal Hygiene and Healthy Lifestyle on Environmental Sanitation

Yusriani Sapta Dewi, Deni Kurniawan

Abstract— *In general, health conditions of housewives are related to their environment' conditions. The health of housewives can be traced from their personal hygiene and healthy lifestyles. This study was done to find out the effect of personal hygiene and healthy lifestyle of housewives on environmental sanitation, as an activity aimed at improving and maintaining standards of environmental conditions that affect welfare. Important components of environmental sanitation including: solid waste management, household wastewater management, management of human feces, food sanitation, pest and vector control, pet control, education and hygiene promotion. The method used in this research was Ex Post Facto research with a 2 x 2 factorial design, with simple random sampling done on 80 housewives in Depok Jaya, Pancoran Mas, Depok, West Java, Indonesia. The data were analyzed using two-way ANOVA test and Tukey test. The results of the study were: 1) there was a difference in environmental sanitation between housewives with accurate personal hygiene and those who have inaccurate personal hygiene. 2) there were differences in environmental sanitation in those who have healthy lifestyle and those with unhealthy lifestyle; 3) for those who have a healthy lifestyle, more positive environmental sanitation was found in those who have more accurate personal hygiene; 4) for those who have unhealthy lifestyle, more positive environmental sanitation was found in those with inaccurate personal hygiene; 5) there was a significant interaction effect between personal hygiene and a healthy lifestyle on environmental sanitation. To improve environmental sanitation, it is important to consider personal hygiene and healthy lifestyle.*

Index Terms— *personal hygiene, healthy lifestyle, environmental sanitation*

I. INTRODUCTION

The health of housewives depends largely on the conditions of their environmental sanitation. The low level of health of housewives can be traced by looking at environment-related factors such as the presence of polluted water sources, soil and air pollution, poor house condition, the presence of vectors of diseases and insects that threaten the health of housewives. The World Health Organization (WHO) defines sanitation as the facilities and services that can be used to dispose of human waste safely [1]. Therefore, poor sanitation can cause various diseases, while healthy environmental sanitation has a significant impact on health, social, and economic life in households and in society because the environment includes not only water, air and land but also conditions the social and economic place in which we live [2].

In most developing countries, good environmental sanitation has not fulfilled the standards. In some Nigerian states, people living side by side with garbage is a common thing Lagos, which is a large slum in Nigeria, has slightly improved its environmental sanitation conditions in the late eighties or early nineties, but there is still much to be done [3].

The danger of disease due to poor environmental sanitation conditions occurs in a quarter of the total world population and as many as 30% occur in sub-Saharan Africa. 13 million deaths every year can be prevented by making our environment healthier. These facts show the impact of environmental sanitation factors on public health. At present, more than 2 billion people in the world do not have access to proper sanitation and they still dispose of their waste in an unhealthy way [4].

Diseases related to environmental sanitation exacerbate poverty by decreasing productivity and household income. Also, the high cost of living, low levels of education and large curative health costs affect the local and national economy. Also, a dirty environment in most major cities can deter tourists or investors and affect the tourism of the city. Consequently, action is needed to thoroughly resolve environmental sanitation problems to prevent adverse impacts on health, economy and development. Therefore, the researcher is interested in conducting research with the title "The Influence of Personal Hygiene and Healthy Lifestyle on Environmental Sanitation" in Depok Jaya, Pancoran Mas Depok, West Java, Indonesia.

Environmental sanitation helps reduce the risk of epidemics in the community. Temporary trash cans should be placed in public places such as markets and parking lots, so people will be able to dispose of garbage in the place, and not on the roadside or into rivers. Communities are required to participate in environmental sanitation programs and provide sanctions to offenders, that may be able to provide deterrent effects to others in the community [5]. Environmental sanitation is a series of actions or processes to safely collect and dispose of all types of waste in the environment to protect and promote better health and quality of life. In general, environmental sanitation includes the provision of facilities and services to dispose of waste safely, maintenance of hygienic conditions, and prevention of diseases. So, public health intervention is an important key for social and economic development, especially in developing countries. This leads to improvements in health,

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Yusriani Sapta Dewi, Satya Negara Indonesia University, Indonesia.
(E-mail: ysaptadewi@gmail.com)

Deni Kurniawan, Satya Negara Indonesia University, Indonesia. (E-mail: kurniawan.deni73@yahoo.com)

welfare and productivity and also benefits individuals, households and communities [6].

Environmental health is a balanced state between humans and their physical, emotional, and social environment. Health plays an important role in everyday life, so much that there is a saying, "everything means nothing without health". All countries want their citizen to have good health. Personal hygiene is an act of hygiene carried out by each, to provide and maintain physical, psychological and social health [7].

As a whole, hygiene includes bodily hygiene and proper maintenance of personal appearance. Naturally, personal hygiene understands the importance of personal hygiene and how to maintain it. Personal hygiene requires knowledge of health, proactive attitudes and actions to maintain the health and prevent the risk of disease, including efforts to maintain food hygiene, control the elements of food, places and utensils that can cause illness or health problems. Personal hygiene also includes the habit of washing hands and brushing teeth to maintain oral health, prevent viruses, and fungi away from our bodies with a habit to take a bath routinely. Good personal hygiene will help us to remain comfortable with ourselves. Those who do not maintain their hygiene and use dirty clothes, body odor and bad breath will be shunned and cause mental problems. The most important thing in this subject is that everyone has responsibility for their hygiene; but some people do it better than others, depending on their culture, society and family norms [8].

The habit to live clean must be started since early childhood. Good hygiene habits, if started at an early age, will become a habit in adulthood. The way to transmit the disease among school-age children is through hand touch. Therefore, washing hands with soap will help protect children from diarrhea and respiratory infections. Hand hygiene significantly reduces disease in primary school students by 26% [9]. The right time to wash hands is after using the toilet, after cleaning, and before touching food [10]. The perception of the importance of hand washing greatly influences the beliefs and practices of hand washing [11]. Therefore, education about hygiene should be started from the family and as early as possible. A study conducted in Ethiopia found that 60% of children surveyed did not know that disease can be transmitted via human waste [12]. Thus, awareness of the health aspects of sanitation behavior is important because it determines the level of continuity of intervention in sanitation behavior.

The growth of microbes due to germs can cause various infectious diseases, especially among children and housewives. Children with poor personal hygiene can transmit the disease to other children. The cause seems very trivial, such as dirty body that never gets showered, dirty clothes or oily hair because it is never washed. This situation can reduce the self-esteem of children and parents. The parent can be considered as negligent in maintaining their children's personal hygiene. Correct hygiene practices include taking a bath and wash hands regularly, washing and keeping the hair short, wearing clean clothes, brushing teeth, changing toothbrushes regularly, cutting fingernails, washing clothes every day, avoid cigarettes and alcohol. Other personal hygiene practices include covering the mouth

when coughing, removing dirty tissue properly, ensuring the toilet is clean, ensuring clean food handling, keeping the drinking water source clean, and preventing spitting in public places [13]. A bad environment and personal hygiene can cause bad impact on people's health in several ways; such as oral and gum disease caused by poor oral hygiene, can also cause premature tooth loss.

The results of a study showed that most children who attend school in rural areas had developed a good awareness of clean living. Clean living awareness is found to be increasing among children in rural areas. This means that school children in rural areas have a good awareness of clean living. They maintain their hygiene regularly, while also spread awareness about personal hygiene in their respective regions [14].

Lifestyle is defined as a style in everyday life that reflects the attitudes and values of a person or group. A healthy lifestyle can make the body healthy, energetic, and resistant to disease, based on daily habits. Good nutrition, daily exercises and getting enough sleep are the foundation for sustainable health. A healthy lifestyle includes healthy habits, which means protecting yourself from all diseases, doing regular medical check-ups, living healthy with a balanced diet, regular exercise, good work and sleep balance, not taking dangerous drugs, alcohol, or tobacco.

The goal of healthy lifestyle behaviors is not only to prevent illness or treat sick people but also to bring someone's health to a better level. Lack of exercise and lack of healthy living habits are the main reasons for health problems. Healthy lifestyle behaviors can reduce disease and based on research conducted; a non-exercise lifestyle causes several chronic diseases [15].

The instruments of a healthy lifestyle including physical activity, responsibility for health, nutrition, support from people around us and stress management components [16]. The healthpromotion lifestyle profile was evaluated using item analysis, factor analysis, and reliability measures. Factor analysis isolates six dimensions : self actualization, health responsibility, sport, nutrition, interpersonal support, and stress management [17]. Self actualization is the desire of someone to use all their abilities to achieve whatever they want and can do. Health responsibility is an individual's sense of responsibility towards his/her health. Physical activity is defined as doing exercises regularly. Nutrition is defined as the choice of individuals in regulating his/her food and the value of his/her food. Moral development focuses on developing inner health. Interpersonal relationship is a relationship with others, especially in communication. Stress management can be defined as the actions taken to manage individual physiological resources in reducing and controlling stress.

There are various lifestyle factors in questionnaires' standard. Four lifestyle factors (body mass index), physical activity, alcohol use and sleep duration) [18]. BMI is categorized as < 18.5; 18.5 – 24.9; 25 - 30; or > 30 kg / m [19]. Physical activity is categorized as "Frequent (exercise at least three times per week)", "Occasional" or "Every day".



Use of alcohol is classified as "None", "Occasional" or "Frequent (at least once a week for at least the previous 6 months)". Sleep duration is classified as "<6 hours / day", "6-8 hours / day" or "> 8 hours / day" [20].

Population growth in Qatar has experienced significant lifestyle changes due to rapid urbanization, the dominance of private transportation, the introduction of modern devices, the availability of high-fat and calorie-dense foods, increased dependence on telecommunications technology, and decreased job demands [21]. These lifestyle changes have a considerable impact on reducing the need for physical movement in everyday life. Lifestyle transformation is considered responsible for a significant increase in diseases such as cardiovascular disease (CVD), cancer and type II diabetes mellitus in Qatar [22].

II. RESEARCH METHODOLOGY

This study aims to provide information and analyze the influence of personal hygiene and healthy lifestyle on environmental sanitation. Location of the research was in Depok Jaya Village, Pancoran Mas District, Depok City, West Java, Indonesia. This study used an ex post facto approach with a 2 x 2 factorial design. The sampling was done using a random technique of 80 housewives. Housewives acted as the spearhead in the formation of environmental sanitation, personal hygiene and lifestyle in the family. Data were analyzed using a two-way ANOVA test and Tukey test.

III. RESULT AND DISCUSSIONS

The results of the calculation of variants analysis are presented in the following Table 1:

Table 1 Summary of the results of ANOVA 2x2

Source of Variance	dk	JK	RJK	F _{count}	F _{table}	
					$\alpha = 0.05$	$\alpha = 0.01$
Effect of personal hygiene (A)	1	22.05	22.05	4.71*	3.96	3.96
Effect of healthy lifestyle (B)	1	31.25	31.25	6.68*	3.96	3.96
Interaction	1	1862.45	1862.45	397.8**	3.96	6.96
Between groups	3	1915.75		136.4**	2.72	4.04
Within a group	76	355.80	4.682			
Total	79	20087.4				

Note: *significant ** very significant

The results of the test on research hypothesis shows some interaction, so the Tukey test was also done. The results is presented in the following Table 2:

Table 2. Result of Tukey Test

Compared groups	Q _{count}	Q _{table}	Note
A ₁ B ₁ with A ₂ B ₁	22.12	3.96	Significant
A ₁ B ₂ with A ₂ B ₂	17.78	3.96	Significant

Note :

A₁B₁ : The group with accurate personal hygiene and healthy lifestyle

A₁B₂ : The group with accurate personal hygiene and unhealthy lifestyle

A₂B₁ : The group with inaccurate personal hygiene and healthy lifestyle

A₂B₂ : The group with inaccurate personal hygiene and unhealthy lifestyle

Based on the calculation results presented in Table 1 and 2, the results of this research are:

- There was a difference in environmental sanitation between housewives with accurate personal hygiene and those who have inaccurate personal hygiene.

The results of the two-way ANOVA calculation were $F_{count} > F_{table (1;79) (\alpha=0.05)}$ or $(4.71 > 3.96)$. The results showed that there were significant differences in the environmental sanitation of housewives with accurate personal hygiene and those who have inaccurate personal hygiene. This is consistent with the results of Nefer's research, bad personal hygiene and environment can affect health in several ways. An unclean environment makes people in it more susceptible to diseases such as colds, fever, diarrhea, flu, etc. due to excessive exposure to germs, either carried by themselves or by other people [23].

Environmental sanitation meant in this research is the activity of housewives based on knowledge, attitudes and preventive actions in improving and maintaining the standards of environmental conditions, including the dimensions of clean water facilities, household latrines, waste water disposal facilities and waste management facilities. Housewives can be considered as having accurate personal hygiene if they take a bath and wash their hands regularly, wash their hair, wear clean clothes, brush their teeth, change toothbrushes regularly, cut their fingernails, wash clothes every day, avoid smoking and alcohol, close their mouth when coughing, dispose of dirty tissue properly, make sure the toilet is clean, ensure that the food handling area is clean, keep the drinking water source clean, and not spit on the road, while they can be considered as having inaccurate personal hygiene if their daily life habits is the opposite of those with accurate personal hygiene. Environmental sanitation helps reduce the risk of epidemics in the community. Therefore, the community must participate in a monthly environmental sanitation program and punish violators to provide deterrent effects to others in the community. Temporary trash cans should be placed in markets and parking lots so that people will be able to dispose of their waste there rather than on the roadside or in the river [24]. Based on the explanation above, the results of the research show there were significant differences in the

environmental sanitation of housewives with accurate personal hygiene and those who have inaccurate personal hygiene.

- b. There were differences in environmental sanitation in those who have healthy lifestyle and those with unhealthy lifestyle

The results of the two-way ANOVA calculation were $F_{count} > F_{table(1;79)} (\alpha=0.05)$ or $(6.68 > 3.96)$. The results showed that there were significant differences in environmental sanitation of housewives with healthy lifestyle and those with unhealthy lifestyle. This matches the results of Al-Nuaim's research, which showed that population in Qatar has experienced significant lifestyle changes due to rapid urbanization, domination of private transportation, introduction of labor-saving devices, availability of high-fat and calorie-dense foods, increased dependence on telecommunications technology, as well as decreasing job demands [25].

A healthy lifestyle including conducts regular medical checkups, lives healthy with a balanced diet, regular exercise, good working life and sleep balance, no dangerous drugs, alcohol, or tobacco. Unhealthy lifestyle is the opposite of a healthy lifestyle. Based on the explanation above, the results of the research showed that there were significant differences in environmental sanitation of housewives with healthy lifestyle and those with unhealthy lifestyle.

- c. For those with a healthy lifestyle, more positive environmental sanitation was found in those with accurate personal hygiene compared to those with inaccurate personal hygiene

The mean of A_1B_1 group was 55.8 and the mean of A_2B_1 was 49.2; it can be seen that there were differences in environmental sanitation. After the significance level of difference was tested using the Tukey test at $\alpha = 0.05$; it was known that the value of $Q_{count} = 22.12$ while the value of $Q_{table} = 3.96$. The results showed that among housewives with a healthy lifestyle, more positive environmental sanitation was found in those with accurate personal hygiene compared to those with inaccurate personal hygiene

Inadequate environmental sanitation will be harmful to public health. Tap water as the main source of clean water, usually disinfected by boiling before consumption. Unhealthy practices still occur in the community. Therefore, to improve sanitation conditions in the community, the government must develop and implement a more intensive approach to introduce environmental sanitation using health education [26]. Unhealthy lifestyle behaviors have an impact on health. It is necessary to increase awareness of healthy lifestyles, especially healthy diets, the importance of exercise and periodic medical examinations, as well as personal hygiene and avoiding drug abuse [27].

- d. For those with unhealthy lifestyle, more positive environmental sanitation was found in those with inaccurate personal hygiene compared to those with accurate personal hygiene

The mean of A_1B_2 group was 44.9 and the mean of A_2B_2 was 53.5; it can be seen that there were differences in environmental sanitation. After the significance level of difference was tested using the Tukey test at $\alpha = 0.05$; it was known that the value of $Q_{count} = 17.78$ while the value of

$Q_{table} = 3.96$. The results showed that among housewives with unhealthy lifestyle, more positive environmental sanitation was found in those with inaccurate personal hygiene compared to those with accurate personal hygiene.

The results are supported by the finding that increasing family income and education level have an influence on increasing awareness of healthy lifestyle behaviors [28]. Good health and sanitation are important factors for social and economic development. Rural water supply and sanitation projects, maximizing the health benefits of toilets built, hand washing facilities and waste disposal can increase the level of cleanliness and environmental sanitation [29].

- e. There was a significant interaction effect between personal hygiene and a healthy lifestyle on environmental sanitation.

The results of the two-way ANOVA showed that $F_{count} = 397.8 > F_{table} = 4.04$ at the significance level $\alpha = 0.01$. The results showed that there was a very significant interaction effect between personal hygiene and healthy lifestyle on environmental sanitation. This matches the results of research which showed that environmental sanitation helps to decrease the risk of epidemics in the community [30]. Therefore, the community must participate in a monthly environmental sanitation program and impose sanction violators in order to provide deterrent effects to others in the community.

The graphic of simple effect of personal hygiene and healthy lifestyle on environmental sanitation is presented in the following Figure 1:

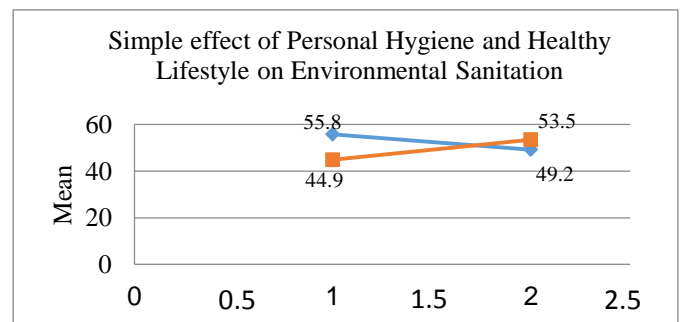


Fig. 1. Simple effect of personal hygiene and healthy lifestyle on environmental sanitation

Environmental sanitation is the control and supervision of the physical, biological, social and economic environment that affects human health in relation to disease transmission, which is detrimental to the physical development of health and human survival. Environmental sanitation activities are management of solid waste, water and waste water treatment, industrial waste treatment and control of noise and pollution [31]. Based on the explanation above, by the results of the research, there was a significant interaction effect between personal hygiene and a healthy lifestyle on environmental sanitation.



IV. CONCLUSION AND RECOMMENDATION

Based on the test on the hypothesis, there were some findings, including:

- a. There was a difference in environmental sanitation between housewives with accurate personal hygiene and those who have inaccurate personal hygiene.
- b. There were differences in environmental sanitation in those who have healthy lifestyle and those with unhealthy lifestyle.
- c. For those with a healthy lifestyle, more positive environmental sanitation was found in those with accurate personal hygiene compared to those with inaccurate personal hygiene.
- d. For those with unhealthy lifestyle, more positive environmental sanitation was found in those with inaccurate personal hygiene compared to those with accurate personal hygiene
- e. There was a significant interaction effect between personal hygiene and a healthy lifestyle on environmental sanitation.

Based on the findings of this research, it can be concluded that among housewives with healthy lifestyle, more positive environmental sanitation was found in those with accurate personal hygiene compared to those with inaccurate personal hygiene. As for those with unhealthy lifestyle, more positive environmental sanitation was found in those with inaccurate personal hygiene compared to those with accurate personal hygiene. The assessment of environmental sanitation of housewives is not only influenced by personal hygiene, but also by how healthy is their lifestyle.

Recommendation of this research is that it is necessary to consider the financial income factor of housewives, which may affect environmental sanitation of the community.

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