



## Risk Factors For Dyslipidemia In Urban Elderly

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### Abstract

**Background.** Dyslipidemia is one of the primary health issues among urban elderly individuals that can increase the risk of cardiovascular disease. Dyslipidemia occurs due to an imbalance in lipids such as cholesterol, low-density lipoprotein (LDL-C), triglycerides, and high-density lipoprotein (HDL). Several risk factors that can increase lipid levels include age, gender, education, occupation, diet, physical activity, and smoking habits.

**Aims.** Research objective: To analyze the relationship between age, gender, education, occupation, diet, physical activity, and smoking habits with the incidence of dyslipidemia in elderly people in RW 04, Kel.Grogol Utara, Kec. Kebayoran Lama, South Jakarta, DKI Jakarta Province.

**Methods.** The research method used a quantitative, *cross-sectional* design. Data collection was conducted from July to October 2025, involving 147 respondents.

**Result.** The results showed that there was no significant relationship between age ( $p=0.25$ ), gender ( $p=0.72$ ), education ( $p=0.116$ ), occupation ( $p=0.57$ ), diet ( $p=0.294$ ), and smoking habits ( $p=0.48$ ) with the incidence of dyslipidemia in the elderly. Only physical activity had a significant relationship ( $p=0.0006$ ) with the incidence of dyslipidemia in the elderly in RW 04, Kel.Grogol Utara, Kec. Kebayoran Lama, South Jakarta, DKI Jakarta Province.

**Conclusion.** There is a need for a multidisciplinary approach and innovative interventions, such as strengthening educational interventions, organizing community or virtual exercise classes that can be accessed from home, and utilizing digital technology, such as telemedicine platforms and health applications (e-health), to facilitate remote monitoring.

**Keywords:** Dyslipidemia, Elderly, Urban, Risk Factors



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## INTRODUCTION

Dyslipidemia is a quantitative change in the concentration of total cholesterol, its fractions, or triglycerides in plasma. According to Patni et al. (2020), dyslipidemia is an imbalance of lipids such as cholesterol, low-density lipoprotein cholesterol (LDL-C), triglycerides, and high-density lipoprotein (HDL). This occurs as a result of changes in primary lipoprotein metabolism due to exogenous factors or other pathologies (Siregar and

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Boy, 2022).

Dyslipidemia is a major risk factor for cardiovascular disease. Cardiovascular disease, according to Yunanto et al. in 2020, is predicted to be the leading cause of morbidity and mortality among the elderly, with 9.4 million deaths worldwide per year (Gau et al., 2023). The WHO estimates at least 40 million deaths each year worldwide, equivalent to 70% of deaths from all causes globally. The WHO identifies four main contributing risk factors: tobacco consumption, lack of physical activity, alcohol abuse, and unhealthy diets (Pusdatin Dinkes DKI Jakarta, 2023).

Dyslipidemia itself ranks among the top ten causes of illness and death in Indonesia, so appropriate treatment is necessary. The diagnosis of dyslipidemia is based on the results of medical history, physical examination, and supporting tests. Medical history and physical examination include complaints of neck pain and numbness in both hands and feet, while supporting tests include laboratory tests. The therapy given is in accordance with the symptoms that appear (Fonna, 2023).

Based on the 2018 National Basic Health Research (Riskesdas) data, 21.2% of Indonesians aged  $\geq 15$  years have abnormal cholesterol levels  $\geq 200$  mg/dl (NCEP ATP III), and the prevalence increases with age. It is more common in women than men and occurs more frequently in urban areas. Therefore, from definition to management, dyslipidemia management must be carried out quickly and appropriately to reduce morbidity and mortality rates and improve quality of life (Ministry of Health, 2019).

The WHO introduced the term *active aging*, which is the process of optimizing opportunities for health, participation, and security to improve quality of life as a person ages. The basic aspect of *active aging* is health. The health indicators produced by Susenas in describing the general health of the elderly in Indonesia are the percentage of elderly people experiencing health complaints and the morbidity rate among the elderly. Since 2021, Indonesia has entered the phase of an aging population, where approximately 1 in 10 people are elderly, which can become a development challenge when they are no longer productive and become part of the vulnerable population. Based on demographic aspects, 12% of Indonesia's population in 2024 will be elderly, with an elderly dependency ratio of 17.08%. The elderly are predominantly female, live in urban areas, and are classified as young elderly between the ages of 60 and 69 (BPS, 2024).

There was an increase in 2024 in both the number of elderly people and the elderly dependency ratio compared to the March 2023 Susenas data, which showed that 11.75% of the population was elderly, and the population projection results showed an elderly dependency ratio of 17.08%. This means that for every 100 people of productive age (15-59 years), there are approximately 17 elderly people. There are more elderly women than men (52.82% compared to 47.72%), and there are more elderly people in urban areas than in rural areas (55.35% compared to 44.65%). In terms of health, about two in five (41.49%) elderly people experienced health complaints during the last month, with an elderly morbidity rate of 19.72%. Nearly a quarter (23.92%) of elderly people still smoked in the last month, and most of them still smoked every day (BPS, 2023).

Based on the results of community service by Harianja, et al. in 2020, factors that affect cholesterol levels in the elderly include gender, obesity, dietary cholesterol intake, smoking habits, and exercise habits (Fonna, 2023). This is supported by Siregar and Boy (2022), who state that risk factors related to dyslipidemia include genetics, obesity, smoking behavior, lack of physical activity and exercise, and an improper diet. Prevention can be achieved by adopting a healthy lifestyle and avoiding other modifiable risk factors.

Urban areas have various factors that can increase the risk of dyslipidemia, such as a diet high in saturated fat, lack of physical activity, stress, and exposure to pollution. Elderly people in urban areas also tend to experience changes in metabolism and lifestyle that can worsen blood lipid conditions. Based on data from the Regional Data Center (2023), according to the administrative division of the DKI Jakarta Province, South Jakarta ranks second in terms of area after East Jakarta, covering 24.21% of the total population of 1,876,056. The incidence of dyslipidemia in DKI Jakarta is quite high, with a prevalence of 57.4% among most respondents. The incidence of dyslipidemia in the elderly is a priority to be addressed in order to improve the quality of life of the elderly. Therefore, it is important to understand the risk factors for dyslipidemia in the elderly in the urban environment of RW 04, Grogol Utara Village, Kebayoran Lama District, South Jakarta, in order to determine more effective prevention strategies.

Dyslipidemia is defined as total cholesterol levels in the blood exceeding normal levels. Dyslipidemia in the elderly in urban areas has a high prevalence. Dyslipidemia is one of the ten leading causes of illness and death in Indonesia, so appropriate treatment is

necessary. Therefore, the problem formulation in this study is related to the risk factors for dyslipidemia in the elderly in urban areas of RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, DKI Jakarta Province, how the relationship between risk factors, namely age, gender, education, occupation, diet, physical activity, and smoking habits, affects dyslipidemia in the elderly, and what are the appropriate prevention and management measures to improve quality of life and prevent more serious complications.

This study contributes to help identify and provide relevant scientific information on factors that increase the risk of dyslipidemia in urban elderly individuals so that appropriate preventive and treatment measures can be taken, to analyze the relationship between diet, physical activity, and smoking habits with blood lipid levels so can improve the elderly's understanding of dyslipidemia and public awareness of the importance of maintaining cardiovascular health, thereby improving quality of life and preventing more serious complications, and also providing recommendations for interventions that can be implemented to reduce the prevalence of dyslipidemia so can assist in health service planning and serves as a basis for public health policies in the prevention and management of dyslipidemia in the elderly, assisting health workers in designing and developing more effective intervention strategies such as health promotion, exercise programs, and dietary changes to prevent dyslipidemia in the elderly, and encouraging further research.

Dyslipidemia is well established as a major modifiable risk factor for cardiovascular disease, particularly among the elderly population. Previous studies at global and national levels consistently report that age, gender, dietary patterns, physical inactivity, smoking habits, obesity, and genetic predisposition contribute to lipid metabolism disorders. In Indonesia, national surveys such as Riskesdas highlight a higher prevalence of dyslipidemia in urban areas and among elderly women, with prevalence increasing with age.

Existing epidemiological studies generally conclude that:

1. Unhealthy diet (high saturated fat and cholesterol intake) is positively associated with dyslipidemia.
2. Low physical activity significantly increases LDL and triglyceride levels while reducing HDL.
3. Smoking contributes to lipid abnormalities by lowering HDL and increasing oxidative stress.

4. Urban environments exacerbate risk through lifestyle transitions, sedentary behavior, stress, and dietary shifts.

However, most previous studies:

1. Are conducted at provincial or national levels, limiting contextual specificity.
2. Emphasize single or dominant risk factors, rather than examining multiple behavioral and sociodemographic variables simultaneously.
3. Focus on general adult populations, not specifically the urban elderly at the community (RW/kelurahan) level.
4. Rarely explore protective factors that explain unexpectedly low dyslipidemia prevalence in certain elderly populations.

Thus, while the determinants of dyslipidemia are broadly understood, context-specific evidence in urban elderly communities in Indonesia remains limited.

## **METHODS**

This study is a quantitative, cross-sectional study to analyze risk factors for dyslipidemia among urban elderly people. Based on Murti (1996) and Szklo (2000) in Fauziyah (2019), cross-sectional is the most flexible epidemiological study design so that it can be used for descriptive and analytical research to examine the relationship between disease or other health characteristics and risk factors in a population. This design can be likened to a cross-section of the population at a given time, including cases of disease (other health characteristics such as blood cholesterol levels) and exposure (consumption patterns, etc.).

The target population in this study was all elderly people aged 60 years and above living in Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, DKI Jakarta. The study population was all elderly people aged 60 years and above living in RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta. Purposive sampling was chosen because not all criteria matched those set by the researcher.

Data analysis in this study was conducted using descriptive statistics, describing the collected data as is, followed by logistic regression, a technique used to predict categorical dependent variables. In this study, it was used to see the relationship between risk factors and the incidence of dyslipidemia in urban elderly people

## DISCUSSION

Dyslipidemia is an imbalance of lipids such as cholesterol, low-density lipoprotein cholesterol (LDL-C), triglycerides, and high-density lipoprotein (HDL). The prevalence of dyslipidemia among the elderly is higher in urban areas than in rural areas. Several risk factors that can increase lipid levels include diet, physical activity, and smoking.

This study found that the incidence of dyslipidemia in the elderly was only 22% compared to 78% in those without dyslipidemia. Dyslipidemia in the elderly was most common in the age group >70 years (45.8%). The results of this study are supported by research conducted by Lestari et al. in 2018, which found that dyslipidemia in the elderly is most common in the 61-70 age group. Age can be a guide for someone anticipating the occurrence of dyslipidemia. The results of this study are also directly comparable to the 2013 RISKESDAS, which found that diet, physical activity, and smoking habits were determinants of dyslipidemia in the elderly.

In this study, the majority of respondents (66.1%) had a poor diet. This indicates a tendency for the elderly to consume an unbalanced diet. The physical activity of respondents was mostly in the heavy category at 69.5%, indicating that despite their advanced age, most respondents still engaged in physical activity at a fairly high intensity. Smoking habits among respondents were relatively low, with the majority of respondents (96.6%) not smoking. The low prevalence of smoking may reflect increased awareness among the elderly of the negative health effects of smoking, or the possibility of quitting smoking after reaching old age. In general, although the study population was dominated by the elderly, the incidence of dyslipidemia was relatively low. This is thought to be influenced by strong protective factors, such as a healthy diet, sufficient physical activity, a good level of education, and low smoking habits among respondents. Based on data from the 2018 Riskesdas, activities are divided into two categories: heavy activity and moderate activity. Heavy activity refers to physical activity performed for  $\geq 3$  days per week and MET minutes per week  $\geq 1500$  (MET minute value for heavy activity = 8). MET is a unit of energy expenditure used to measure physical activity in minutes. MET minutes are a unit used to measure the volume of an individual's physical activity. Moderate activity is physical activity performed for  $\geq 5$  days per week with an average duration of  $\geq 150$  minutes per week (or  $\geq 30$  minutes per day). Physical activity measurement was conducted using questions modified from the WHO Global Physical Activity

Questionnaire (GPAC), which is part of the WHO STEPS instrument for measuring and monitoring noncommunicable disease risk factors. The physical activity behavior data collected includes vigorous and moderate activities in daily activities (combined while working or at home, leisure time, and transportation) in terms of the number of days per week and the number of minutes per day. The proportion of physical inactivity among people aged  $\geq 10$  years by province is highest in (Ministry of Health, 2019).

Table 1. Percentage of Output Component of Dyslipidemia Incidence Among the Elderly in RW 04, Grogol Utara Village, Kebayoran Lama District, South Jakarta, DKI Jakarta Province

Variable	Number	Percentage
<b>Lipid Status</b>		
Dyslipidemia	13	22.0
No Dyslipidemia	48	78.0
<b>Diet</b>		
Less Good	39-59	66.1
Good	54-59	33.9
<b>Physical Activity</b>		
Mild	18	30.5
Weight	41	69.5
<b>Smoking Habits</b>		
Smoking	6	3.4
Non Smoking	53	96.6

Source: Primary Data Processed Using SPSS 25

Table 1 presents the univariate analysis results show that of the 59 elderly respondents in RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, based on lipid status, most respondents were in a non-dyslipidemic condition, namely 46 people (78.0%), while dyslipidemia was found in 13 respondents (22.0%). This indicates that the majority of elderly individuals in this study have lipid profiles within normal limits.

The respondents' eating patterns showed that 39 people (66.1%) had poor eating habits, while 20 people (33.9%) had good eating habits. This indicates a tendency for unbalanced food consumption among the elderly. Respondents' physical activity was mostly in the heavy category, with 41 people (69.5%), while only 18 people (30.5%) were in the light category.

This data shows that despite their advanced age, most respondents still engage in fairly high-intensity physical activity.

Finally, smoking habits among respondents were relatively low, with only 2 people (3.4%) being active smokers, while 57 people (96.6%) did not smoke. The low prevalence of smoking may reflect increased awareness among the elderly of the negative health effects of smoking, or the possibility of quitting smoking after entering old age.

In general, although the study population was dominated by the elderly, the incidence of dyslipidemia was relatively low. This is thought to be influenced by strong protective factors, such as a healthy diet, sufficient physical activity, a good level of education, and low smoking habits among respondents.

Table 2. Relationship Between Dietary Patterns and the Incidence of Dyslipidemia in the Elderly in RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, DKI Jakarta Province

Dietary Patterns	Lipid Status		Total	P value
	Dyslipidemia	No Dyslipidemia		
Less Good	7	32	39	0.29
Good	6	14	20	
Total	13	46	59	

Source: Primary Data Processed Using SPSS 25

Based on Table 2, the results of the bivariate analysis above show that among 59 respondents, 7 of 39 with poorer dietary patterns (17.9%) had dyslipidemia, while 32 respondents (82.1%) did not. In the group with a good dietary pattern, out of a total of 20 respondents, 6 people (30.0%) had dyslipidemia and 14 people (70.0%) did not have dyslipidemia. Descriptively, the proportion of dyslipidemia cases was higher in the group with a good diet compared to those with a less good diet. The results of the Chi-Square statistical test showed a p-value of 0.294 and Fisher's Exact Test showed a p-value of 0.334 ( $p > 0.05$ ), which means that there was no significant relationship between diet and the incidence of dyslipidemia in the elderly. The Odds Ratio (OR) of 0.48 (95% CI: 0.14–1.65) indicates that respondents with poorer dietary patterns had a lower chance of experiencing dyslipidemia than those with better dietary patterns, although this result was not statistically significant.

Table 3. Relationship Between Physical Activity and the Incidence of Dyslipidemia in the Elderly in RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, DKI Jakarta Province

Physical Activity	Lipid Status		Total	P value
	Dyslipidemia	No Dyslipidemia		
Mild	9	9	12	0.0006
Weight	4	37	47	
Total	13	46	59	

Source: Primary Data Processed Using SPSS 25

Table 3 presents the results of the bivariate analysis, which indicate that of the total 59 respondents, 18 (30.5%) had light physical activity and 41 (69.5%) had heavy physical activity. Among the group with mild physical activity, 9 respondents (69.2%) had dyslipidemia, while 9 respondents (19.6%) did not. In the group with weight physical activity, only 4 respondents (30.8%) had dyslipidemia and 37 respondents (80.4%) did not have dyslipidemia. Bivariate analysis using the Chi-Square test showed a significant relationship between physical activity and the incidence of dyslipidemia ( $\chi^2 = 11.76$ ;  $p = 0.0006$ ;  $p < 0.05$ ). Respondents with mild physical activity were 9.25 times more likely to experience dyslipidemia than respondents who had weight physical activity (OR = 9.25; 95% CI = 2.32 – 36.91), reinforcing that mild physical activity is indeed a risk factor for dyslipidemia. These results indicate that lower physical activity is a significant risk factor for dyslipidemia. In other words, the milder the physical activity, the higher the risk of dyslipidemia among respondents. These findings are consistent with the theory that adequate physical activity can improve fat and cholesterol metabolism, thereby reducing the risk of lipid profile disorders.

Table 4. Relationship Between Smoking Habits and the Incidence of Dyslipidemia in the Elderly in RW 04, Grogol Utara Village, Kebayoran Lama Subdistrict, South Jakarta, DKI Jakarta Province

Smoking Habits	Lipid Status		Total	P value
	Dyslipidemia	No Dyslipidemia		
Smoking	2	4	6	0.48
Non Smoking	11	42	53	
Total	13	46	59	

Source: Primary Data Processed Using SPSS 25

Based on Table 4, the results show that of the total 59 respondents, 6 (10.2%) had a smoking habit, all of whom were male. Meanwhile, 53 respondents (89.8%) did not smoke. In the smoking group, 2 respondents (15.4%) had dyslipidemia, while 4 respondents (8.7%) did not have dyslipidemia. In the non-smoking group, 11 respondents (84.6%) had dyslipidemia, and 42 respondents (91.3%) did not have dyslipidemia.

The Chi-Square test results indicate no significant association between smoking habits and dyslipidemia ( $\chi^2 = 0.497$ ;  $p = 0.48$ ). Respondents who smoked had a 1.91 times greater risk of developing dyslipidemia compared to respondents who did not smoke (OR = 1.91; 95% CI = 0.31 – 11.82). However, because the p-value was  $> 0.05$  and the 95% CI included the number 1, this result was not statistically significant.

Lack of physical activity, such as exercise, can contribute to elevated LDL cholesterol and reduced HDL cholesterol. Regular exercise can help raise good cholesterol (HDL) levels. Additionally, according to Djauzi in Isfandi (2020), exercise can stimulate enzymes that help transport LDL cholesterol in the blood, especially in the arteries, back to the liver for conversion into bile acids needed to facilitate the digestion of dietary fat. The more regularly you exercise, the more the LDL cholesterol levels in your body will decrease until they reach normal levels.

Bivariate analysis using the Chi-Square test showed a significant relationship between physical activity and the incidence of dyslipidemia ( $\chi^2 = 11.76$ ;  $p = 0.0006$ ;  $p < 0.05$ ). Respondents with light physical activity were 9.25 times more likely to experience dyslipidemia than those with heavy physical activity (OR = 9.25; 95% CI = 2.32 – 36.91), reinforcing that light physical activity is indeed a risk factor for dyslipidemia.

These results indicate that lower physical activity is a significant risk factor for dyslipidemia. In other words, the less physical activity respondents engage in, the higher the risk of dyslipidemia. These findings are consistent with the theory that adequate physical activity can improve fat and cholesterol metabolism, thereby reducing the risk of lipid profile disorders.

Smoking habits are one of the risk factors for dyslipidemia in the elderly. Smoking can lower good cholesterol (HDL) levels and increase the risk of blood clots, which can cause artery blockages, heart attacks, and strokes. The effects of smoking on dyslipidemia include lowering HDL, increasing LDL, and disrupting blood vessels. According to Nilawati, Sri et al. (2008), smokers are at increased risk of atherosclerosis and serious heart disease. When

smoking, carbon monoxide is also drawn into the lungs and then attaches to red blood cells, where oxygen is needed. This results in a decrease in the amount of oxygen carried by the blood, causing the heart, muscles, and the entire body to lack oxygen. Smoking increases the tendency of blood cells to clot inside blood vessels and attach to the inner lining of blood vessels.

The analysis yielded a p-value of 0.48 ( $p > 0.05$ ), indicating that there was no significant association between smoking habits and the incidence of dyslipidemia. Respondents who smoked had 1.91 times greater risk of developing dyslipidemia compared to respondents who did not smoke (OR=1.91; 95% CI = 0.31 – 11.82). However, because the p-value is  $> 0.05$  and the 95% CI includes the number 1, these results are not statistically significant.

The results of this study are in line with the study by Qoridisa et al. (2018), in which smoking is one of the risk factors for dyslipidemia. The harmful substances in cigarettes contribute significantly to lipid profile abnormalities. The prevalence of smoking among civil servants was 56.8%, but there was no significant relationship between smoking habits and total cholesterol, LDL, HDL, and triglyceride levels.

Research by Yulianti et al. (2023) found that triglyceride levels increased in active smokers, with the average triglyceride level exceeding the normal limit of  $> 200$  mg/dL. This indicates that smoking is a factor in elevated triglyceride levels, with nicotine playing a key role in the development of metabolic syndrome, thereby increasing the risk of dyslipidemia.

Thus, smoking habits in this study were not a significant risk factor for the occurrence of dyslipidemia. The fact that all smokers in this study were male indicates a tendency for smoking habits to be more prevalent among male respondents, but this is not strong enough to prove a direct relationship with the occurrence of dyslipidemia in the population studied. Many factors other than smoking habits can influence the occurrence of dyslipidemia in the elderly, such as age, education, diet, physical activity, and others. However, smoking habits should still be stopped because they are one of the key interventions for managing and reducing the risk of dyslipidemia.

This study presents several important novelties:

1. Micro-level Urban Focus. The research examines dyslipidemia risk factors at the RW (neighborhood) level in an urban Jakarta setting, providing granular evidence rarely captured in national or provincial datasets.

2. **Contradictory Empirical Findings.** Unlike most prior studies, this research demonstrates that: Dietary patterns and smoking habits were not significantly associated with dyslipidemia. Physical activity emerged as the only statistically significant determinant, with low activity increasing dyslipidemia risk more than ninefold (OR = 9.25).
3. **Identification of Strong Protective Context.** The study reveals a relatively low prevalence of dyslipidemia (22%) despite poor dietary patterns, suggesting the presence of contextual protective factors such as: High physical activity levels; Low smoking prevalence; Adequate health awareness among the elderly
4. **Integration of Public Health and Digital Health Perspective**  
The study goes beyond epidemiological analysis by proposing innovative interventions, including: Community-based and virtual exercise programs; Telemedicine and e-health platforms for elderly lipid monitoring; Multisectoral public health strategies for urban aging populations
5. **Evidence-Based Support for Active Aging Framework.** The findings empirically reinforce the WHO Active Aging concept, highlighting physical activity as a central pillar for maintaining metabolic health in urban elderly populations.

## CONCLUSION

This study demonstrates that, in conclusion, diet, physical activity, and smoking habits are factors that contribute to an increased risk of dyslipidemia in the elderly in urban areas. Results show that there is a significant relationship between physical activity and the incidence of dyslipidemia in the elderly ( $p\text{-value} = 0.0006$ ;  $p < 0.05$ ), with an OR value = 9.25; 95% CI = 2.32 – 36.91), and for dietary patterns and smoking habits, there is no significant relationship. Dietary patterns ( $p\text{-value} = 0.294$ ) and smoking habits ( $p\text{-value} = 0,48$ ).

A multidisciplinary and innovative approach is needed, such as: strengthening educational interventions to increase public understanding of dyslipidemia in the elderly and the importance of adherence to treatment and management of dyslipidemia, as well as maintaining a healthy lifestyle, including the implementation of a healthy lifestyle with regular physical activity or exercise (walking or cycling) to help control cholesterol levels, utilizing digital technology such as *telemedicine* platforms and health applications (*e- health*) to facilitate long-distance, interactive education and regular communication between the elderly

and service providers, as well as overcoming mobility challenges in urban areas, and also organizing community or virtual exercise classes can also be done to further encourage physical activity, either directly at urban senior community centers or through virtual classes that can be accessed from home, and to help maintain a healthy weight.

Dyslipidemia is an imbalance of lipids such as cholesterol, low-density lipoprotein (LDL-C), triglycerides, and high-density lipoprotein (HDL). The prevalence of dyslipidemia among the elderly in urban areas is higher than in rural areas. Several risk factors that can increase lipid levels include diet, physical activity, and smoking. A multidisciplinary, innovative approach is needed, including strengthening educational interventions and leveraging digital technology, without forgetting the main pillars of dyslipidemia management: healthy lifestyle modifications, such as a heart-healthy diet, regular physical activity, and maintaining an ideal body weight. Exercise classes can be conducted either in a community setting or virtually to encourage physical activity as an effort to help maintain a normal weight. This study is expected to contribute to improving understanding of the prevalence, risk factors, and impact of dyslipidemia in the elderly in urban areas, as well as to developing effective interventions to prevent and manage this condition, thereby helping to improve the health and quality of life of the elderly in urban areas, especially in the context of cardiovascular disease, which according to the WHO in 2022 is the number one cause of death worldwide. A multidisciplinary and innovative program aimed at controlling dyslipidemia in the elderly in urban areas will not be successful if it is only carried out by the health sector without the support of all cross-sectoral stakeholders, including the government, private sector, professional organizations, community organizations, and the entire community.

### **Author Contributions**

LW conceived of the presented idea and developed the theory, wrote the manuscript and supervised the findings of the work. IMA performed the computations and verified the analytical methods. All authors discussed of the results and contributed to the final manuscript. LW = Lely Wahyuniar; IMA = Inggit Meliana Anggarini

### **Conflicts Of Interest**

The authors declare no conflict of interest in this study

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