

Factors Affecting the Acceptance of Non-Communicable Disease Prevention and Control Policies Among Adolescents: A Path Analysis

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Abstract

Objective

This study aims to scrutinize the determinants of acceptance non-communicable disease prevention and control policies among adolescents.

Method

This research employed an analytic observational method with a cross-sectional approach. It was conducted in Semarang and involved 1396 adolescents selected through simple random sampling. Respondents are from the Semarang area, Central Java. The distribution of questionnaires in this study was carried out using google form which was distributed on the WhatsApp social media platform. The endogenous variable focused on the education and acceptance of non-communicable disease prevention and control policies among adolescents, with exogenous variables, including age, sex, and economic status. The inclusion criteria were adolescents of 18–24 years of age in Semarang and willing to be a respondent. The exclusion criteria in this study were respondents who did not fill out the questionnaire completely. The data was collected through a questionnaire and analyzed using chi-square to explore the relationship between the endogenous and exogenous variables. To identify both direct and indirect factors linked to the acceptance of non-communicable disease prevention and control policies, Stata 13 was utilized.

Results

There is a statistically significant correlation between age (OR= 1.68, CI 95% = 1.23 to 2.30, p= 0.001), education (OR= 1.55, CI 95% = 1.17 to 2.06, p= 0.003), sex (OR= 1.50, CI 95% = 1.13 to 1.97, p= 0.005), and economic status (OR= 1.37, CI 95% = 1.00 to 1.87, p= 0.045) and the acceptance of non-communicable disease prevention and control policies among adolescents. The path analysis model demonstrates that age, education, sex, and economic status

have a direct impact on the acceptance of these policies. Simultaneously, it indicates that age, sex, and economic status indirectly influence the endorsement of policies for preventing and controlling non-communicable diseases.

Conclusion

Age, education, sex, and economic status are key factors influencing the acceptance of non-communicable disease prevention and control policies among adolescents. To address the challenges posed by non-communicable diseases, it is crucial to implement comprehensive and holistic intervention efforts, encompassing promotive, preventive, curative, and rehabilitative measures as a unified continuum of care.

Introduction

One of the fundamental issues encountered by the global population is the challenge of public health, encompassing infectious and non-communicable diseases (hereafter referred to as NCDs).^[1] Consequently, this dual burden refers to the coexistence of unresolved infectious diseases and the rising cases of NCDs.^[2,3] In the Indonesian context, the nation is currently grappling with a growing number of NCDs, posing a significant health concern. Moreover, the increasing prevalence of NCDs not only impacts the morbidity, mortality, and disability rates in the community, but also contributes to the increasing economic burden, both at individual and national levels.^[4] Recent research indicates that NCDs issues are multifaceted and can be attributed to two major categories of risk factors. Firstly, there is an uncontrollable risk factor, namely age. Moreover, the emergence of metabolic disorders in adulthood adds to the complexity of the situation. Children born with growth disorders have a higher likelihood of developing metabolic disturbances, particularly in fats, proteins, and carbohydrates.^[5] Consequently, this increases the risk of NCDs in adulthood. Additionally, it is noteworthy that even if children are born healthy and well-nourished, they may still be at a greater risk for NCDs due to unhealthy lifestyle factors, such as an imbalanced diet and low physical activity during childhood. Therefore, it is crucial to highlight that NCDs have become the leading cause of mortality in Indonesia.^[6]

Talking about a Disability-Adjusted Life Year, the most significant contributors to DALY's loss in 2017 were stroke, ischemic heart disease, diabetes, newborn diseases, and tuberculosis.^[7] In general, the risk factors for non-communicable diseases can be classified into three main categories.^[8] Firstly, there are metabolic disorder risk factors involving aspects such as hypertension, hyperglycemia, obesity, dyslipidemia, kidney dysfunction, as well as issues of malnutrition in pregnant women and children. Additionally, there are behavioral risk factors

like dietary habits, smoking, occupational health risks, a sedentary lifestyle, and alcohol consumption. Furthermore, environmental factors like air pollution, violence, and impoverished living situations also influence NCDs.^[9,10]

Nowadays, the health issues faced by teenagers are increasingly complex.^[11] The Ministry of Health (MoH) highlights one of these issues, which is non-communicable diseases (NCDs). Among various types of NCDs, there are four major ones categorized as the predominant causes of mortality in Indonesia. These include cardiovascular diseases, malignancies, metabolic disorders, and chronic respiratory diseases.^[12] According to WHO, NCDs, particularly cardiovascular diseases, malignancies, metabolic disorders, and chronic respiratory diseases, account for over 70% of global mortality.^[13] Concurrently, NCDs have emerged as the primary cause of mortality in Indonesia and are serious illnesses commonly faced by the aged population. Additionally, with demographic and epidemiological shifts occurring, the prevalence of NCDs is increasingly posing a hazard to the adolescent age group.^[14,15]

As a result, this shift will significantly impact Indonesia's manpower and economy. Furthermore, between 2030 and 2040, experts predict that Indonesia will experience a demographic dividend,^[16] with the population of the productive-age group significantly surpassing that of the non-productive age group. If there is an upward trend in NCDs among adolescents, Indonesia's efforts to create a healthy and intelligent generation, moving towards an advanced Indonesia by 2045, will be challenging to achieve.^[17]

Several government programs aimed at promoting adolescent health involve efforts to enhance disease prevention and early detection and improve communication through health literacy sessions utilizing the Health Report Book instrument. Additionally, these initiatives focus on fostering balanced nutritional habits through communal breakfast/snack sessions, encouraging physical activity in schools with the 4L program (Jump, Run, Leap, and Throw) during breaks or sports periods, and establishing smoke-free zones within school premises.^[18] Despite the action plan's overall emphasis on prevention, the Indonesian Ministry of Health's current action plan for the directorate for prevention and disease control (2020–2024) only has one NCD target that includes adolescents, namely “early detection screening for NCD risks including people aged 15 and above.” The lack of policy targets emphasizes how young people are not given enough consideration given Indonesia's high NCD burden. Adolescents' requirements for screening and early intervention of NCD hazards could be met with improved implementation and assessment. Socialization related to non-communicable disease prevention and control policies for adolescents has been carried out through counseling carried out by health workers both at health service facilities and educational institutions and public services.

To effectively reduce the prevalence of NCDs, adolescents need to change their unhealthy behaviors and recognize the significance of adopting a healthy lifestyle to maintain and enhance their well-being.^[19] Moreover, teenagers need to acquire knowledge about NCDs to prevent and reduce the associated risk factors.^[20] Therefore, preventive measures should be implemented throughout the life cycle, spanning from pregnancy, infancy, childhood, adolescence, and adulthood to the elderly. Specifically, during the first 1000 days after birth and during adolescence, prevention efforts should focus on meeting balanced nutritional needs. Additionally, adherence to balanced nutritional guidelines should be coupled with regular and consistent physical activity. This is crucial since a deficiency in physical activity might operate as a contributing factor to the development of NCDs.^[21]

Another preventive measure that can be taken during adolescence is early detection, accomplished through screenings to identify risk factors as early as possible. The objective of early detection is to control NCD risk factors and promptly follow up with individuals at risk of NCDs to ensure timely intervention. Moreover, implementing measures to prevent NCDs among teenagers can help decrease their prevalence in Indonesia. This is because the risk factors experienced during adolescence can influence the occurrence of NCDs in adulthood and old age.^[22]

Given the increasing concern about NCD risk factors, particularly metabolic and behavioral factors, strategic efforts are needed. These efforts include enhancing promotive and preventive measures and educating the public about the prevention of risk factors.^[23] Moreover, there is a need to improve screening and early detection of non-communicable diseases across healthcare facilities, empower communities to control these diseases, enhance the quality of primary healthcare services as the front-line gatekeeper, and strengthen referral systems. All of these measures should be supported by cross-sectoral initiatives related to the Healthy Living Movement.^[24] The prevention of primary NCDs can be accomplished by enacting government programs specifically designed to prevent and control these types of diseases.^[25] This involves prioritizing preventive and promotive approaches through various educational and promotional activities, while also addressing curative and rehabilitative aspects through enhancing the accessibility and quality of nutritional and healthcare services.^[26]

In addition, it is crucial to implement preventive measures at every stage of the human life cycle, commencing during gestation and extending through neonatal, early childhood, school age, adolescence, adulthood, and into the elderly stage. Simultaneously, improvements in maintaining a hygienic and healthy lifestyle are paramount. The term “entire life cycle” encompasses the stages of

pregnancy, birth, school-age children, adolescents, adults, and the elderly, with a focus on addressing specific health issues that arise within each age group. During the initial 1,000 days of life, the focus is on preventing growth abnormalities by fulfilling fundamental nutritional and health requirements.^[27] Finally, it is crucial to engage all sectors, including both the government and the public, in actively cooperating to prevent NCDs. Based on the explanation provided, the researcher conducted a study to analyze the determinants of acceptance non-communicable disease prevention and control policies among adolescents.

Materials and Methods

Study design and sample

This research utilized an analytic observational method with a cross-sectional research design, conducted in Semarang, Central Java, from January to September 2023. The study utilized a simple random sampling technique to choose samples of adolescents from the population in Semarang. The inclusion criteria comprised adolescents aged 18 to 24 who participated in online questionnaires, resulting in the final sample size of 1396 participants. The study considered several exogenous variables, including age, sex, and economic status, while the endogenous variable was the education and acceptance of NCD prevention and control policy among adolescents. Research aimed to analyze the determinants of influencing acceptance of non-communicable disease prevention and control policies among adolescents.

Data collection

For data collection in this research, a questionnaire was distributed, encompassing aspects such as age, education, sex, economic status, and acceptance of non-communicable disease prevention and control policies. Acceptance of non-communicable disease prevention and control policies namely early detection screening for NCD risks which focused on reducing the major risk factors for noncommunicable diseases (NCDs) – tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol were measured with single questions and dichotomized as yes or no. The inclusion criteria were adolescents of 18–24 years of age in Semarang and willing to be a respondent. The exclusion criteria in this study were respondents who did not fill out the questionnaire completely. The distribution of questionnaire in this study was carried out using google form which was distributed on the WhatsApp social media platform. Additionally, conducting a thorough literature review informed the development of the questionnaire to ensure its relevance and accuracy. Furthermore, to assess the reliability of the questionnaire, a Cronbach's Alpha test was conducted using the Statistical Package for the Social Sciences (SPSS).

Data analysis

In this study, analysis was employed to investigate the relationship between the dependent and independent variables using chi-square test. This test enabled researchers to compare the distribution of a categorical variable in a sample or a group with its distribution in another. If the distribution is not significantly different, it suggests no relationship or association between the variables and groups. In other words, the categorical variables and groups are considered independent in terms of their distribution patterns. Furthermore, multivariate logistic regression was adopted to determine the acceptance of non-communicable disease prevention and control policies. Incomplete responses, defined as those with one or more missing answers, were excluded from the analysis. The analysis utilized Stata 13 software to perform path analysis, allowing for the examination of both direct and indirect factors related to the acceptance of non-communicable disease prevention and control policies.

Ethical Approval

This study received approval from the Health Research Ethics Committee at Wilujeng Hospital (Reference: 076/XII/HREC/2022).

Results

Table 1 illustrates the social and demographic details of the participants involved in this study. The age group 21 to 24 years was the most prevalent (64.1%). Besides, women comprised most of the research participants (64.3%), with the most common education level being Senior high school (41.7%). A significant portion resided in urban areas (69.3%). Notably, a substantial number of respondents reported no history of non-communicable disease (90.0%). Furthermore, the study had a high participation rate among respondents whose households lacked family members with non-communicable diseases (65.4%).

Characteristics	n (%)
Age	
18-20	501 (35.9)
21-24	895 (64.1)
Sex	
Male	499 (35.7)
Female	897 (64.3)
Education level	
Junior High School	430 (30.8)
Senior High School	582 (41.7)
Diploma 3	384 (27.5)
Economic status	
< Regional minimum wage	327 (23.4)
≥ Regional minimum wage	1069 (76.6)
The area of residence	
Town	968 (69.3)
A village or a rural area	428 (30.7)
The history of Non-communicable Diseases	
No	1256 (90.0)
Yes	140 (10.0)
Parents with Non-communicable Diseases	
No	48 (3.4)
Yes	1348 (96.6)
Family members in their household with Non-communicable Disease	
No	926 (65.4)
Yes	489 (34.6)

Table 2 presents the risk factor characteristics of the respondents. The adolescent respondents mainly consumed vegetables and fruits ≥ 5 servings per day (55.0%). Most respondents reported consuming soft drinks almost every day (75.4%). A total of 721 respondents (51.6%) stated that they did not consume fast-food products. The majority of respondents stated low-risk physical activity levels (69.6%). Overall, most respondents (75.4%) reported not smoking.

Risk Factor	n (%)
Vegetable and fruit consumption	
< 5 servings per day	628 (45.0)
≥ 5 servings per day	768 (55.0)
Consumption of soft drinks	
almost every day	1052 (75.4)
never	344 (24.6)
Fast food consumption	
almost every day	675 (48.4)
never	721 (51.6)
Physical activity	
Risk	425 (30.4)
No risk *	971 (69.6)
Smoke	
No	1052 (75.4)
Yes	344 (24.6)

*perform physical activity at least 60 minutes a day for ≥ 3 days a week

Table 3 demonstrates the relationship between age, education, sex, and economic status. According to **Table 3**, a higher percentage of adolescents aged 21-24 years expressed acceptance of the non-communicable disease prevention and control policy compared to those aged 18-20, and this difference was statistically significant ($p < 0.001$). Furthermore, adolescents with an education level below senior high school demonstrated less acceptance of the non-communicable disease prevention and control policy than those with a senior high school education or higher, and this difference was statistically significant ($p = < 0.001$). Besides, female adolescents showed higher acceptance of the non-communicable disease prevention and control policy than males. Additionally, adolescents with an economic status above the regional minimum wage were more likely to accept the non-communicable disease prevention and control policy than those with a lower economic status.

According to **Table 4**, adolescents aged 21-24 were 1.68 times more likely to accept the non-communicable disease prevention and control policy compared to those under 21 years. Also, individuals with a senior high school education or higher had a 1.55 times higher likelihood of accepting the non-communicable disease prevention and control policy compared to those with a lower level of education.

Table 3. The results of the chi-squared test for factors related to non-communicable disease prevention and control policy

Variables	NCD Prevention and Control Policy				x ²	p
	Acceptance		Hesitancy			
	n	%	n	%		
Age						
18-20	437	87.2	64	12.8	15.79	<0.001
21-24	704	78.7	191	21.3		
Education						
< Senior High School	327	76.0	103	24.0	13.46	<0.001
≥ Senior High School	814	84.3	152	15.7		
Sex						
Male	388	77.8	111	22.2	8.23	0.004
Female	753	83.9	144	16.1		
Economic status						
< Regional minimum wage	251	76.8	76	23.2	7.08	0.008
≥ Regional minimum wage	890	83.3	179	16.7		

Table 4. Results of the multiple logistic regression analysis

Variables	B	OR	SE	Wald	CI 95%		p
					Lower	Upper	
Age	0.52	1.68	0.16	10.5	1.23	2.30	0.001
Education	0.44	1.55	0.15	9.1	1.17	2.06	0.003
Sex	0.40	1.50	0.14	7.8	1.13	1.97	0.005
Economic Status	0.32	1.37	0.16	4.0	1.00	1.87	0.045
Number of samples = 1.396							
Nagelkerke R ² = 5.3%							

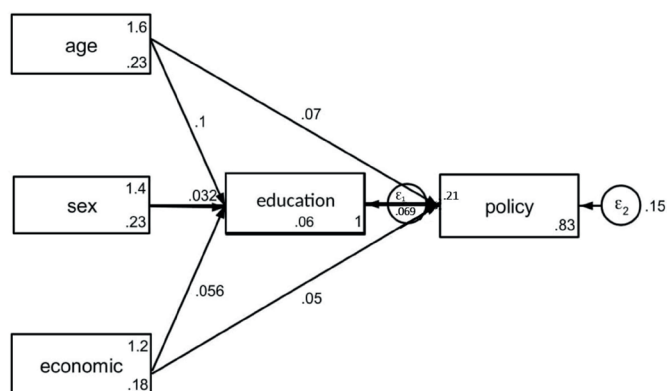


Figure 1. Path Analysis Model

Furthermore, female adolescents were 1.50 times more likely to accept the non-communicable disease prevention and control policy compared to their male counterparts. Moreover, adolescents from families with incomes above the minimum regional wage had a 1.37 times higher likelihood of accepting the non-communicable disease prevention and control policy than those with lower incomes.

The path model (Figure 1) illustrates the relationships between age, sex, and economic status toward education and policy acceptance. As shown in Figure 1, the exogenous variables in the models included categorical age groups (1 = 18-20 years and 2 = 21-24 years) with a mean=1.6 and variance= 0.23, sex (1 = male and 2 = female) had a mean of 1.4 and a variance of 0.23. Economic status (1= < regional minimum wage and 2 = ≥ regional minimum wage) had a mean of 1.2 and a variance of 0.18. The endogenous variables included education (1 = < Senior High School and 2 = ≥ Senior High School), with a standard error (SE)=0.06, and acceptance of the NCD policy (1= no and 2 = yes), with a constant of 0.83.

Table 5 indicated that age (p=0.001), sex (p=0.005), economic status (p=0.042), and education (p=0.002) directly influenced the acceptance of non-communicable disease prevention and control policy. Besides, education mediated the relationships between age (p<0.001), sex (p=0.054), and economic status (p=0.052) concerning the acceptance of non-communicable disease prevention and control policy.

Discussion

The present study determines factors of acceptance non-communicable disease prevention and control policies among adolescents in Indonesia namely early detection. Non-communicable diseases (NCDs) are poised to become a major health concern, exceeding infectious diseases in terms of medical costs.^[28] According to the World Health Organization (WHO), NCDs account for approximately 71% of all deaths worldwide, with a higher prevalence

in developing countries. Furthermore, NCDs, including cardiovascular diseases, cerebrovascular events, malignancies, prolonged pulmonary conditions, and metabolic disorders, are prominently recognized as the primary global causes of mortality.^[29]

The growing prevalence of NCDs correlates with an increase in risk factors, including heightened blood pressure, elevated blood sugar levels, high body mass index or obesity, bad dietary habits, inadequate physical activity, as well as smoking and alcohol consumption.^[30] Lack of physical activity and a sedentary lifestyle can contribute to weight gain, elevated blood pressure, and a multitude of other health issues. In England, only 21% of boys and 16% of girls meet minimum physical activity recommendations for their health, a trend that remains in decline. Half of the UK’s population of 11–25 year olds (4.5 million) are inactive.^[31] In addition, the consumption of tobacco and alcohol during adolescence might result in enduring health complications, including respiratory ailments, liver malfunctions, and malignancies.^[32] The study by Bando (2020) about 7% (25/360) of the students had ever smoked. Majority of them (271/360) were physically inactive and 15% (55/360) were either overweight or obese.^[21] Adolescents who spend a significant amount of time in front of gadget screens and are not actively engaged in sports or adequate physical activities are susceptible to experiencing health problems.^[33,34] Therefore, a profound understanding of the behavioral risk factors associated with NCDs in adolescents is crucial for developing effective intervention approaches aimed at preventing and controlling these diseases.^[35] To overcome these conditions, health promotion efforts for adolescents are needed related to changes in health behavior to improve the quality of life. Survey study by Rocka (2022) referred to 1662 (53%) boys and 1465 (47%) girls, with a mean age of 12.1 ± 3.4 years. During a routine weekday, most children (71%) spent >4 h on educational activities using electronic devices, and 43% of children spent 1–2 h using devices for recreational purposes. The majority of children (89%) were exposed to screens during meals, and ate snacks between main meals (77%).^[36]

Table 5. Path analysis results

Endogenous Variable	Exogenous Variables	β	SE	p	95% CI	
Direct effect						
NCD prevention and control policy	Age	0.07	0.02	0.001	0.03	0.11
NCD prevention and control policy	Sex	0.06	0.02	0.005	0.02	0.10
NCD prevention and control policy	Economic status	0.05	0.02	0.042	0.00	0.10
NCD prevention and control policy	Education	0.07	0.02	0.002	0.03	0.11
Indirect effect						
Education	Age	0.10	0.02	<0.001	0.05	0.15
Education	Sex	0.03	0.03	0.054	0.01	0.08
Education	Economic status	0.06	0.03	0.052	0.00	0.11
Model Fit						
CFI = 1.00			(≥ 0.97)			
RMSEA = 0.00			(≤ 0.05)			

Through non-communicable disease prevention and control policies, it is feasible to develop an appropriate approach to influence their decisions and behaviors, thereby promoting a shift towards a healthier lifestyle. Furthermore, adopting healthy behaviors typically begins in adolescence and continues into adulthood and old age.^[37] Age is a critical factor in the development of NCDs. As people get older, their understanding of how to prevent and manage certain diseases increases, indicating that awareness of health and knowledge can be influenced by age. Moreover, age influences an individual's cognitive capacities and cognitive processes; as someone ages, they acquire more knowledge.^[38] Additionally, age is frequently associated with behaviors that exhibit a tendency to avoid taking risks. Furthermore, age-related factors impact an individual's cognitive processes and responses to risks, resulting in a greater likelihood of older individuals responding to identified risks.^[39] A study by Akseer (2020) the availability of policies and laws targeting NCD-related lifestyle and behavioral risk factors among adolescents varied substantially across regions. Across countries in the African region, the majority perform well with available national policies and strategies for sexual/ reproductive health/family planning (95%), violence (85%) and mental health (82%), nutritional interventions (80%), alcohol use prevention (79%), tobacco control activities (79%), and injury prevention (71%). Policies which exempt adolescents aged 15–19 years from user fees in the public sector are more common in SouthEast Asia (71% of countries) and are lacking in Africa (21%). Across other regions, the Western Pacific region specifically lacked in policies on mental health and nutritional interventions. In the Eastern Mediterranean, less than 45% of countries had adolescentspecific policies on alcohol use and injury/violence prevention.^[20]

Based on research findings, the prevalence of smoking among adolescents (aged 10–18 years) has increased from 7.2% to 9.1% in 2018. This percentage deviates from the target of 5.4% set in the National Medium-Term Development Plan for 2029. Hence, it is imperative to closely monitor the consumption of electronic cigarettes by adolescents, given that the vapor emitted by these cigarettes contains toxic substances that pose a threat to an individual's health. To decrease the occurrence of smoking, particularly among novice smokers (adolescents), it is necessary to focus on adopting WHO Framework Convention on Tobacco Control, enforcing Smoke-Free Areas (SFA), organizing cessation programs, raising tobacco taxes and prices (implementing sin tax), and banning advertising, promotion, and sponsorship of cigarettes.^[40]

Acceptance of non-communicable disease prevention and control policies in this study is also influenced by gender. Gender is another factor that can influence an individual's health behavior. Women typically exhibit a greater degree

of attentiveness towards their environmental conditions and health. They also have a tendency to exhibit more positive behaviors than men. This instills a heightened sense of awareness in women regarding their surroundings and well-being. Furthermore, women generally possess better knowledge about disease prevention and control than men. This could be attributed to the fact that they have a greater amount of time available to engage in reading or participate in discussions about disease prevention and control with their surroundings.^[41] Obtaining knowledge and awareness regarding disease prevention and control is challenging, particularly concerning gender, as it influences lifestyle behaviors. Adolescents possess diverse habits, with males exhibiting significant differences in comparison to females. Additionally, biological factors contribute to the development of diverse behaviors. Hence, considering this biological factor, it is reasonable to assert that inherent distinctions result in behavioral distinctions among male and female adolescents, thereby impacting their attitudes and behaviors.^[42]

From a policy perspective, interpretation of the economic status implies that policies should improve access to health care, adherence, and the quality. Efforts to enhance health are closely related to economic capabilities, income levels, and the social environment within households. Moreover, the impact of economic status is widely recognized, with family income being a key measurable factor. Additionally, economic status influences health status, and education plays a significant role in achieving better health outcomes. Furthermore, education has the potential to significantly improve health outcomes and extend life expectancy by promoting behaviors that provide protection against diseases.^[43] Comparably, achieving a higher level of education and financial stability is crucial for minimizing behaviors that contribute to the risk of diseases. This not only provides individuals with greater resources to address and prevent such behaviors but also improves access to better medical care and reinforces the ability to protect oneself against the risk of diseases.^[44] Furthermore, it is essential to recognize that adolescents from lower economic backgrounds may face increased susceptibility to potentially toxic food.^[45] Additionally, the diverse economic conditions within society can significantly influence health levels, resulting in disparities in access to healthcare services based on differences in economic status. In addition, given that the outcomes of health-related education are manifested in the form of health awareness, it is crucial to grasp the notion of awareness. This entails acknowledging the significance of being mentally and physically ready to effectively absorb and participate in specific actions.^[46]

Hence, it can be affirmed that health awareness represents an ideal state wherein individuals possess a comprehensive grasp of their well-being. Through effective policies,

it will increase public awareness of health. Health policies can promote healthy lifestyles and create a supportive environment. In addition, targeted health policies can help people to have a more holistic view of their health. The extent to which one understands and values the importance of health hinges on their level of awareness. This awareness is evident in actions, knowledge, and preventive efforts to maintain optimal health. Furthermore, instilling health awareness in individuals from an early age is crucial to fostering a profound understanding and concern for their well-being. The surrounding environment, both through direct or indirect means, shapes the level of awareness and influences behaviors associated with health. These influences may stem from educational environments, cultural dynamics, societal norms, and various other factors.^[47]

Higher education enhances crucial cognitive skills necessary for continuous learning outside the academic setting.^[48] Through education, individuals can enhance their skills and knowledge. Lack of knowledge and access to information can result in limited understanding of the perils associated with unhealthy behaviors, thereby leading to less motivation to adopt healthy behaviors as a form of acceptance of the policy. For example, individuals with limited exposure to warnings about smoking, poor dietary habits, and lack of exercise may not fully grasp the potential long-term dangers of unhealthy behaviors. They may be more attracted to commercials that promote indulgence in tobacco, unhealthy foods, and alcoholic beverages, despite various pieces of evidence indicating health risks.^[49] A study by Gamage (2017) good knowledge about NCDs was associated with being a science stream student (OR = 3.3; 95%CI:2.1–5.2). Healthy diet was associated with female sex (OR = 2.1; 95%CI: 1.5–3.0), and adequate physical activity with male sex (OR = 2.1; 95% CI:1.4–3.2), non-science-stream (OR = 2.1; 95%CI:1.2–3.7) and upper socioeconomic status (OR = 2.0; 95%CI:1.3–3.0). Non-smoking was associated with overall good knowledge (OR = 4.1; 95%CI:1.2–13.7) and female sex (OR = 0;95%CI:1.5-infinity).^[50]

To effectively address the problem of NCDs, it is essential to implement comprehensive and holistic intervention strategies through policy. These strategies should cover promotive, preventative, curative, and rehabilitative measures as a continuous and interconnected system of care. Furthermore, a policy to alleviate the impact of NCDs entails reinforcing efforts that promote and prevent these diseases by advocating for a healthy lifestyle, enabling communities to manage NCD risk factors, and implementing activities that engage several sectors.^[51] In 2017, the mean NCD policy implementation score was 49.3% (SD 18.4%). Costa Rica and Iran had the joint-highest implementation scores (86.1% of all WHO-recommended policies). Scores were lowest in Haiti and South Sudan (5.5%). Between 2015 and 2017, aggregate implementation

scores rose in 109 countries and regressed in 32 countries. Mean implementation rose for all of the 18 policies except for those targeting alcohol and physical activity. The most commonly implemented policies were clinical guidelines, graphic warnings on tobacco packaging, and NCD risk factor surveys.^[52]

The current study is subject to certain constraints and limitations. This is a random sample representative of the Central Java population and, as such, may be expected to represent a broad cross-section of age, education, sex, and economic status. Secondly, it would be beneficial for future research to more comprehensively correct and evaluate the influence of other factors on non-communicable disease prevention and control policy in this population. In addition, some participants may have had previous experience with health surveys in different areas, which could have influenced their answers. In addition, the data collection method used in this study, which relied on participants having a telephone and being available for contact, may introduce response bias. In addition, the current study utilized a cross-sectional design, which suggested the need for further research into health-related non-communicable disease prevention and control policies. This could be achieved through a longitudinal study that incorporates standardized metrics. On top of that, future studies could improve the depth of data by including open-ended questions alongside closed questions in surveys. It is crucial to recognize that, akin to all surveys, the potential for varied interpretations exists in the definitions and items employed.

Conclusion

Age, education, sex, and economic status significantly influence the acceptance of non-communicable disease prevention and control policies among individuals aged 18 and older. Age, in particular, affects their understanding of non-communicable disease prevention and control policies. Moreover, a higher level of education increases knowledge and acceptance of these policies. Additionally, a favorable economic status contributes to increased acceptance of non-communicable disease prevention and control policies.

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Conflict of Interest

There are no conflicts of interest.

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