The Effect of Interpersonal Communication on Prevention Behavior of Early Hypertension among Student at SMAN 6 and SMAN 19 Bone

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Abstract: *Background*: Hypertension is a health issue that is not only experienced by adults but can also develop during adolescence. This condition often continues into adulthood, with essential hypertension in adults frequently stemming from habits and risk factors that emerge during adolescence. Centers for Disease Control and Prevention (CDC) 2023 revealed that one in every 25 adolescents aged between 12 to 19 years old is diagnosed with hypertension. Among adolescents diagnosed with hypertension, 10% were found to have a prior history of prehypertension.

Objective: This study aims to determine the effect of interpersonal communication on early hypertension prevention behavior among students of SMAN 6 and SMAN 19 Bone.

Materials and Methods: The research design used was Quasi Experiment with pretest-posttest control group design. 110 grade 11 students made up the study population. They were split into two groups: the experimental group, which got an interpersonal communication intervention (n=55), and the control group, which received counseling (n=55). This study was carried out at SMAN 6 and SMAN 19 Bone. Simple random sampling was the method of sampling employed in this study, and a questionnaire was utilized as the research tool to gauge students' knowledge, attitudes, and action both before and after they received the intervention, which had been validated and proven to be reliable. Wilcoxon and Mann-Whitney tests were used for both univariate and bivariate data analysis.

Results: This study showed significant differences in knowledge, attitudes, and actions in the experimental group regarding hypertension prevention behaviors, with p-values for knowledge (p=0.017), attitude (p=0.000), and action (p=0.002).

Conclusion: The interpersonal communication approach applied in the intervention proved to have an influence on hypertension prevention behavior, including knowledge, attitudes, and actions in students of SMAN 6 and SMAN 19 Bone.

Keywords: Hypertension, prevention, interpersonal communication, knowledge, attitude, action.

INTRODUCTION

The increase in cases of non-communicable diseases (NCDs) and their significant impact on public health has prompted the Indonesian government to make NCDs one of the main focuses of health improvement efforts [1, 2]. NCDs, also known as chronic diseases, are health conditions that are not transmitted between individuals and are generally triggered by a combination of hereditary, physiological, environmental, and lifestyle factors [3]. NCDs are often associated with health-risk lifestyle practices, including smoking, eating foods high in fat, and lack of regular physical activity, which can lead to elevated levels of cholesterol, blood sugar, obesity, and hypertension [2].

Hypertension is a medical condition in which a person's blood pressure is abnormally high, with the criteria of systolic pressure equal to or exceeding 140 mmHg and diastolic pressure equal to or exceeding 90 mmHg, which must be confirmed through measurements at least at three different times [4]. Theoretically, due to the degenerative processes associated with aging, hypertension is generally suffered by 6-15% more adults than other age groups. However, the increase in hypertension cases is also becoming more alarming among adolescents [5]. Global data shows that the incidence of hypertension in adolescents ranges from 4% to 15%. However, of these, only about 26% are successfully diagnosed and receive appropriate treatment [6].

The National Health and Nutrition Examination Survey (NHANES) reported that the prevalence of prehypertension and hypertension in children aged 8 to 17 years reached one in ten children [7]. Recent data

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from the Centers for Disease Control and Prevention (CDC) revealed that one in every 25 adolescents between the ages of 12 and 19 is diagnosed with hypertension. Of these adolescents diagnosed with hypertension, one in ten had a history of prehypertension [8]. The high prevalence of hypertension in adolescents is also supported by various studies. One of them is a study conducted in India, which found that 25.1% of adolescents over the age of 13 had hypertension [9]. On the other hand, research in China revealed that 21.1% of adolescents had prehypertension, while 18.6% had hypertension [10].

The Indonesian Health Survey of 2023 recorded two different prevalence rates for hypertension in the Indonesian population aged 15 years and above. Based on the diagnosis made by a doctor, there were 638,178 cases, equivalent to 8%. Meanwhile, based on the results of blood pressure measurements carried out in the survey, 598,983 cases were found or equivalent to 29.2% [11]. The prevalence of hypertension in South Sulawesi Province in 2023 in the population aged 15 years and over showed significant differences depending on the data collection method. Based on the diagnosis made by a doctor, there were 21,459 cases or equivalent to 6.7%. Meanwhile, based on the results of direct blood pressure measurements in the same age population, there were 20,058 cases, equivalent to 29.5% [11].

Hypertension, which is often considered a health problem in adults, can also affect adolescents. Adolescents who show a tendency to have high blood pressure are at greater risk of developing hypertension in adulthood. Although the prevalence of hypertension among adolescents is lower compared to adults, scientific evidence has shown that essential hypertension in adulthood often stems from conditions that developed since adolescence [12]. Research conducted by Sabillah & Aidha [13] which analyzed the risk factors for hypertension in adolescents found that of the 350 respondents, 47.4% (166 respondents) were affected by hypertension with demographic characteristics, namely dominated by late adolescence (15-20 years), male gender, family history without hypertension, coupled with living habits which include lack of physical activity, consumption of fast food, excessive salt and caffeine intake, habit of staying up late and high stress conditions. Adolescents are one of the productive age groups that are expected to play a role in the progress of the nation. In addition, adolescents are considered to have a higher potential life expectancy compared to older age groups [13].

Over the past five years, various studies have identified a number of factors that influence the risk of hypertension in adolescents, with lifestyle being one of the main factors. Research conducted by Merdianti *et al.* [14] found that of the 90 respondents who led a moderate lifestyle, most had normal blood pressure [14]. This research is supported by Zhang [15] which states that an unhealthy lifestyle, especially a diet high in fat and sodium, increases the risk of hypertension. Advances in the health sector are not always in line with the healthy behavior of the community. teenagers' lifestyles are currently undergoing changes, one of which can be seen from their tendency to consume fast food or junk food. Apart from the taste that teenagers like, fast food restaurants also offer fast service, affordable prices, and are easy to find, so they are increasingly favored by them [15]. Consumption of foods that are high in energy, sodium and saturated fat can significantly increase the risk of developing hypertension. Thus, adolescents who have a habit of frequently consuming fast food require more intensive attention and supervision [16].

Based on research conducted by Kartika *et al*. [17], to overcome dietary problems, changes are needed by eating healthy and nutritious foods every day. Foods consumed should be nutritionally complete, low in fat and cholesterol, rich in fiber, vitamins, and minerals. People with hypertension are advised to follow the DASH (Dietary Approaches to Stop Hypertension) diet. Controlling salt intake between 4-6 grams/day, limiting food flavorings, and reducing foods high in cholesterol can help prevent hypertension [17]. The content of nutrients consumed greatly affects the level of health of each individual [18].

Based on research conducted by Junaidi *et al*. [19] on students of the Cendikia Farma Husada Pharmacy Vocational School, it shows that there is a relationship between the level of knowledge about hypertension and clever hypertension behavior in adolescents. This study shows that the formation of smart behavior in dealing with hypertension requires the involvement of other factors, such as supporting factors and driving factors, so that behavior is not only influenced by predisposing factors. According to Lawrence Green Theory, behavior is influenced by predisposing factors such as knowledge, attitudes, beliefs, beliefs, and values; supporting factors such as the availability of health facilities, such as Puskesmas and medicines; and driving factors such as the attitudes and behavior of health workers or other parties who act as reference groups for community behavior [19].

Increased knowledge about hypertension can significantly increase adolescents' positive attitudes towards the importance of hypertension prevention. This positive attitude is then translated into real action. Research conducted by Saputra & Yani [20] which examines the relationship between knowledge and attitudes towards hypertension prevention behavior in adolescents in Bandung City shows that education that increases knowledge can have a direct impact on adolescent attitudes. A positive attitude towards hypertension prevention is also an important factor in behavior change [20].

Research conducted by Putra *et al.* [21] showed that factors associated with hypertension prevention in adolescents include knowledge, attitudes, self-efficacy, social media influence, and peers. This study revealed that 49.2% of respondents had poor hypertension prevention behavior, 44.1% of respondents had poor knowledge, and 45.8% of respondents had poor attitudes [21]. Based on the findings of this study, it is very important to make efforts to increase knowledge about healthy lifestyles that can be applied from an early age, such as through health education with family and a good understanding of the definition and dangers caused by hypertension [22].

Research by Siswanto & Afandi [23] shows that many adolescents in Indonesia do not realize the importance of blood pressure monitoring and the dangers of hypertension. Knowledge and attitudes towards the prevention of hypertension greatly affect the risk of developing hypertension. One way to expand knowledge is through education. Education, especially in the health sector, can improve an individual's level of health. Health education can improve understanding of health and is applied to various target groups using appropriate methods so that the information provided can be well understood [23].

To minimize the greater negative impact of hypertension, effective preventive interventions need to be implemented as early as possible, with the main target being adolescence. This aims to reduce the growth rate of hypertension patients to the lowest possible level [24]. Epidemiology divides disease prevention efforts into four categories based on the stages of development, namely: primordial prevention (at the initial stage), primary prevention (at the first stage), secondary prevention (at the second stage), and tertiary prevention (at the third stage) [25].

So far, the Ministry of Health has tried to improve health promotion using various communication, information and education methods. This effort aims to improve the knowledge, awareness, and motivation of the community in the prevention and treatment of hypertension, so that hypertension rates among people at risk can be controlled or prevented [26]. Health communication is the process of conveying information related to health promotion, disease prevention, and protecting individuals from hazards that can affect human health and safety [27]. Health communication plays an important role in raising individuals' awareness of health issues, health risks, and available solutions. This awareness not only affects the individual themselves but also impacts their family, neighborhood, and community as a whole [27].

In general, media that are often used in health communication include interpersonal communication media, mass communication media, and digital communication media [27]. One of the most effective forms of communication in influencing individuals is interpersonal communication, which is a form of communication that occurs through face-to-face interactions between two or more people [28]. Interpersonal communication has a dialogic nature that allows the communicator (message sender) to know directly whether the message it conveys is received positively, negatively, successfully, or not accepted by the communicant (message recipient). If the message is not delivered effectively, the communicator can hold a question and answer session and provide feedback [29].

Research conducted by Mayasari [30] at Puskesmas Karang Taliwang on the communication strategies of health promotion officers in preventing hypertension suggests that health promotion officers use various strategies in promoting hypertension prevention, including counseling, socialization, appeals through social media, and print media and interpersonal communication (KAP) or interpersonal communication is proven to be the most optimal main strategy in promoting hypertension prevention [30].

Knowledge gained through interpersonal communication can shape positive attitudes towards disease prevention [31]. Effective communication not only informs but also motivates changes in attitudes and behaviors that support disease prevention [32]. Based on research conducted by Rosidawati *et al.* [33] at YP-IPPI Cakung Junior High School, East Jakarta, it shows that there is an increase in adolescents' knowledge about hypertension before and after the intervention. In this case knowledge plays an important role in encouraging behavior change, especially in the

context of disease prevention, such as hypertension. By expanding understanding of the risk factors that contribute to disease, the symptoms that may arise, and the preventive measures that can be taken, individuals will become more aware of the urgency of maintaining health and be encouraged to take preventive action. In this study, the increase in knowledge of adolescents after the intervention shows that appropriate and effective health education can help shape attitudes and behaviors that support hypertension prevention efforts from an early age [33]. A person's attitude towards hypertension prevention is significantly influenced by interpersonal communication. Through effective face-to-face communication, individuals can obtain relevant information, get social support, and receive feedback that helps in forming positive attitudes towards disease prevention. Empathetic and persuasive interpersonal communication can increase awareness, motivation, and attitudes that support healthy preventive actions [20].

Epidemiological data revealed the prevalence of hypertension at the research sites in two different sub-districts. SMAN 6 Bone, located in Kahu sub-district, has a high prevalence of hypertension, which is 23.8% with a total of 9,712 cases in 2021. In this sub-district, the number of hypertensive patients in females (5,595 cases) was higher than males (4,177 cases), indicating the need for a special focus on this group. In addition, only 56.9% of people with hypertension received health services [34]. Meanwhile, SMAN 19 Bone, located in Patimpeng Subdistrict, has a hypertension prevalence of 20% with a total of 3,671 cases in 2021. Although the prevalence is lower than in Kahu sub-district, the number of hypertensive patients in females (2,092 cases) remains higher than males (1,579 cases). The level of access to health services in Patimpeng Sub-district is higher, at 66.3%, but hypertension prevention still requires special attention to increase knowledge and preventive actions among adolescents [34].

Based on the above background, researchers are interested in knowing whether interpersonal communication is more effective than counseling in improving early hypertension prevention behavior in students of SMAN 6 Bone and SMAN 19 Bone.

MATERIALS AND METHODS

Study Design

This type of research is a quasi experiment, with a pretest-posttest design with control group design. the sample in this study were 110 11th grade students who were divided into experimental groups given interpersonal communication to students of SMAN 6 Bone (n=55) and control groups given counseling to students of SMAN 19 Bone (n=55). The sampling method used in this study is probability sampling with simple random sampling technique, where each member of the population has the same opportunity to be selected as a sample. This technique ensures that the selected sample is truly representative of the population, so that the research results can be generalized more accurately. In practice, sample selection is done randomly through a draw, which ensures that each individual has an equal chance of being selected and reduces the risk of bias in respondent selection.

Intervention

Experimental Group

The experimental group received face-to-face interpersonal communication, where each resource person would interact directly with respondents through a one-by-one approach. 55 respondents were divided into five groups, so the resource person in this intervention consisted of five people, namely the researcher who was supported by a team of four people a module that included important information

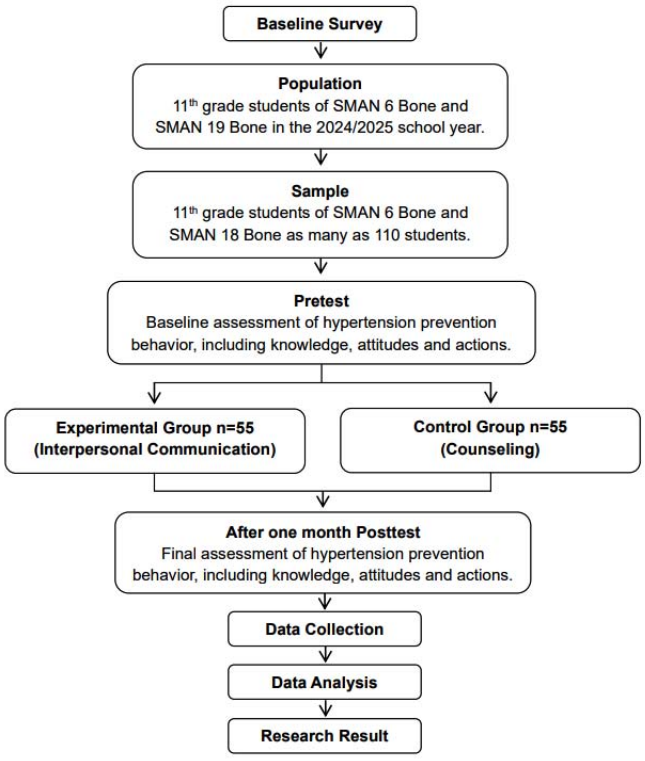

Figure 1: Flow Chart of The Research.

about hypertension was used as the main media in interpersonal communication before the intervention was carried out, the resource person gave a pretest for five minutes. after that the intervention lasted between 10-15 minutes in one meeting only, then the posttest was conducted after one month of the intervention.

Control Group

In addition to the same information and materials, the control group received counseling in the form of a structured presentation using supporting media, namely LCD, projector, and laptop. The delivery of the material refers to the Extension Program Unit which lasts for 30 minutes.

Instrument

This study measures the effectiveness of interventions on hypertension prevention behavior, including knowledge, attitudes, and actions. This questionnaire consists of demographic data, in the form of age and gender, in addition to a list of questions and statements on knowledge, attitudes, and actions to prevent hypertension.

Data Collection

Secondary data were obtained from the Bone Regency Health Office, namely data on the incidence of hypertension and data on all students in the

Figure 2: Research Documentation.

2024/2025 school year obtained from the Student Affairs Section of SMAN 6 Bone and SMAN 19 Bone. Then the primary data was obtained from the results of the pretest and posttest distributed to students of SMAN 6 Bone and SMAN 19 Bone who became the research subjects. After data collection, then the data was processed and analyzed using statistical tests for the benefit of the research results.

Statistical Analysis

Data analysis displays univariate data to see the frequency distribution of general characteristics of respondents. Bivariate analysis was performed using the Wilcoxon test and Mann-Whitney tests to see the average difference between groups after the intervention.

RESULTS

Univariate Analysis

1. Respondent Characteristics

Table **1** shows that most of the respondents in this study came from the age group of 15-16 years. In the experimental group, the proportion of respondents with this age range reached 47.62%, while in the control group it was 52.38%.

In terms of gender characteristics, most of the respondents in the experimental group were female, with the proportion reaching 67.27%. Meanwhile, in the control group, the proportion of male and female respondents was relatively balanced, at 49.09% and 50.91% respectively.

2. Characteristics of Research Variables

Table **2** illustrates the changes in knowledge scores across both groups. In the experimental group, pretest results indicate that (5.45%) of respondents had scores in the poor category, (32.73%) in the moderate category, and (61.82%) in the high category. Posttest results showed an increase in knowledge, with (87.27%) of respondents in the high category, (12.73%) in the moderate category, and none in the poor category.

Meanwhile, in the control group, pretest results revealed that (1.82%) of respondents scored in the poor category, (45.45%) in the moderate category, and (52.73%) in the high category. Posttest results in the control group demonstrated a slight improvement in

Table 1: Frequency Distribution of General Characteristics of Respondents at SMAN 6 Bone and SMAN 19 Bone Year 2024

General Characteristics of Respondents	Experimental		Control	
	n	%	n	%
Age (year)				
15 – 16	40	47,62	44	52,38
17 - 19	15	57,69	11	42,31
Gender				
Male	18	32,73	27	49,09
Female	37	67,27	28	50,91
Total	55	100	55	100

Table 2: Frequency Distribution of Respondents Knowledge before and after Intervention among Students at SMAN 6 Bone and SMAN 19 Bone in 2024

Knowledge	Experimental				Control			
	Pretest		Posttest		Pretest		Posttest	
	n	%	n	%	n	%	n	%
High	34	61,82	48	87,27	29	52,73	38	69,09
Moderate	18	32,73	7	12,73	25	45,45	14	25,45
Poor	3	5,45	0	0,00	1	1,82	3	5,45
Total	55	100	55	100	55	100	55	100

Table 3: Frequency Distribution of Respondents Attitude before and after Intervention among Students at SMAN 6 Bone and SMAN 19 Bone in 2024

Attitude	Experimental				Control			
	Pretest		Posttest		Pretest		Posttest	
	n	%	n	%	n	%	n	%
Positive	31	56,36	47	85,45	23	41,82	26	47,27
Neutral	23	41,82	8	14,55	31	56,36	27	49,09
Negative	1	1,82	0	0,00	1	1,82	2	3,64
Total	55	100	55	100	55	100	55	100

knowledge, with (5.45%) of respondents in the poor category, (25.45%) in the moderate category, and (69.09%) in the high category.

Table **3** presents the changes in attitude scores for both groups. In the experimental group, pretest results showed that (1.82%) of respondents had scores in the negative category, (41.82%) in the neutral category, and (56.36%) in the positive category. Posttest results demonstrated a change in attitudes, with (85.45%) of respondents in the positive category, (14.55%) in the neutral category, and none in the negative category.

In contrast, the control group pretest results indicated that (1.82%) of respondents were in the negative category, (56.36%) in the neutral category, and (41.82%) in the positive category. Posttest results for the control group revealed a slight change in attitudes, with (3.64%) of respondents in the negative category, (49.09%) in the neutral category, and (47.27%) in the positive category.

Table **4** illustrates the changes in action scores for both groups. In the experimental group, the pretest results revealed that (50.91%) of respondents scored in the bad category, (32.73%) in the fair category, and (16.36%) in the good category. After the intervention, the posttest results showed changes in actions, with (45.45%) of respondents in the good category, (41.82%) in the fair category, and (12.73%) in the bad category.

Meanwhile, in the control group, the pretest results indicated that (52.73%) of respondents were in the bad category, (34.55%) in the fair category, and (12.73%) in the good category. Posttest results for the control group showed slight changes in actions, with (54.55%) of respondents in the bad category, (18.18%) in the fair category, and (27.27%) in the good category.

Bivariate Analysis

Based on Table **5**, it is known that there was an increase in knowledge and action variables in both groups, both experimental and control groups, while in the attitude variable there was a decrease in value in the control group. This can be seen from the average value of posttest knowledge and actions that increased after being given interpersonal communication and counseling interventions, while the average value of attitudes decreased after being given counseling interventions.

In the experimental group, the average knowledge score increased from 75.45 to 90.73. The average attitude score also increased from 75.09 to 83.65. In addition, the average value of action in the experimental group also increased from 56.18 to

Table 4: Frequency Distribution of Respondents Action Before and After Intervention Among Students at SMAN 6 Bone and SMAN 19 Bone in 2024

Action	Experimental				Control			
	Pretest		Posttest		Pretest		Posttest	
	n	%	n	%	n	%	n	%
Good	9	16,36	25	45,45	7	12,73	15	27,27
Fair	18	32,73	23	41,82	19	34,55	10	18,18
Bad	28	50,91	7	12,73	29	52,73	30	54,55
Total	55	100	55	100	55	100	55	100

Table 5: Characteristics of Mean Values of Knowledge, Attitude, and Action in the Experimental and Control Groups

Variables	Experimental Group		Control Group		p-value
	Pretest	Posttest	Pretest	Posttest	
Knowledge	75.45 ± 10.86	90.73 ± 10.52	78.73 ± 14.15	79.45 ± 12,24	0.017*
Attitude	75.09 ± 7.85	83.65 ± 6.18	74 ± 8.27	73.75 ± 9.17	0.000*
Action	56.18 ± 17.16	73.45 ± 16.69	54.90 ± 17.52	58.73 ± 20.73	0.002*

Notes: Values are in mean ± standard deviation.
Knowledge, attitude, and practice= mann-whitney test.
*p < 0.05 (within-group analysis).

73.45%. While in the control group, the average knowledge score increased from 78.73 to 79.45. The average attitude score experienced a slight decrease, from 74 to 73.75. For the action variable, the average value in the control group increased from 54.90 to 58.73.

The mean difference between the Experiment group and the control group after the intervention was analyzed using the mann whithey test which showed significant results in all three variables, knowledge (p=0.017), attitude (p=0.000) and action (p=0.002).

DISCUSSION

Knowledge

Knowledge is the result of the human sensory process toward objects through the five senses, including sight, hearing, smell, taste, and touch. It is influenced by the intensity of attention and perception derived from personal experiences that continually develop through interactions with the environment. Each individual possesses unique knowledge based on how they perceive and understand the surrounding world, demonstrating that knowledge undergoes continuous formation and reorganization throughout life [35–37].

The statistical test results for pretest-posttest knowledge scores between the experimental and control groups showed significant results with a p-value of 0.017 (p<0.05), indicating a meaningful difference in knowledge scores between the experimental and control groups before and after the intervention. This demonstrates that the interpersonal communication method is more effective in improving knowledge in the experimental group compared to the control group.

Based on research conducted by Sulaiman [38], it was found that interpersonal communication has a significant relationship with increasing the knowledge of female adolescents at SMAN Muhammadiyah 2 Palembang, as evidenced by the Wilcoxon test with p < 0.05 (p-value = 0.000). Knowledge is acquired through sensory processes involving human senses, such as sight, hearing, smell, taste, and touch. Most knowledge is obtained through sight and hearing, making interaction in interpersonal communication that involves visual and auditory activities effectively enhance individual understanding [38].

This is consistent with research by Barus & Rajagukguk [39] at Puskesmas PB Selayang 2 Medan, which found a significant relationship between interpersonal communication by healthcare workers and patients' knowledge, with p < 0.05 (p-value = 0.031). In general, knowledge can be acquired from experience or information conveyed by others, such as information from books, mass media, or electronic media. To improve the quality of interpersonal communication, healthcare workers need to prioritize openness and honesty in providing explanations, demonstrate empathy, show support, and treat patients equally without discrimination [39].

Interpersonal communication can be used for various purposes. Devito, in his book “The Interpersonal Communication”, explains that every individual involved in interpersonal communication has diverse goals, such as understanding oneself and others, learning more about the world, building and maintaining relationships, influencing attitudes and behaviors, and providing assistance [39, 40].

Attitude

Attitude is an individual's evaluation that encompasses feelings, beliefs, and behavioral aspects, whether in the form of open or closed responses to specific stimuli or objects, which can be positive or negative. Attitude refers to the ability of each individual to communicate their feelings, thoughts, and level of confidence towards others or specific objects through words, gestures, or behavioral actions [41, 42].

The results of the statistical test on pretest-posttest attitude scores between the experimental and control groups showed a significant result with a p-value of 0.000 ($p<0.05$), which means there is a meaningful difference in attitude scores between the experimental and control groups before and after the intervention. This indicates that the interpersonal communication method has a higher effectiveness in changing attitudes in the experimental group compared to the control group.

A study by Verawati *et al.* [43] in Mamuju Regency showed that interpersonal communication had an impact on adolescent attitudes toward early marriage prevention, evidenced by a significant value of 0.001 ($p<0.05$), contributing 76.4% [43].

The findings of this study align with the *Stimulus-Organism-Response* (S-O-R) Theory, which explains that the credibility and ability of the communicator are crucial in determining the success of behavior change in the receiver [44]. In this theory, the stimulus refers to the message delivered by the communicator, while the organism refers to the receiver of the message, namely the adolescents. The response is the visible change, such as an increase in knowledge and attitude changes in adolescents regarding health issues [43].

This study is also consistent with research by Sulaiman [38], which stated that there is a significant impact of interpersonal communication on adolescent attitudes with a p-value of 0.000 ($p<0.05$). Attitude can be understood as a set of beliefs that encompass evaluative aspects. A positive attitude is demonstrated through behaviors that align with expectations, such as acceptance, friendliness, helpfulness, initiative, and acting according to goals. Conversely, a negative attitude is marked by unclear behavior, opposition, doubt, surrender, apathy, despair, or hostility. Based on the data obtained, interpersonal communication can change respondents' attitudes to be more positive, as reflected in the acceptance of the information conveyed. This change shows the effectiveness of interpersonal communication in shaping attitudes as expected [38].

In addition, a study by Choirunissa & Ediati [45] found a significant positive correlation between adolescents' interpersonal communication with parents and emotional regulation in students at SMKN 5 Semarang, with a correlation value of 0.555 and a significance level ($p<0.001$). Good quality interpersonal communication between adolescents and parents contributes to high emotional regulation in students of SMKN 5 Semarang. Effective interpersonal communication between adolescents and parents helps build warm and respectful interactions. The continuous communication process, ranging from light conversations to serious discussions, allows parents to provide full attention and create a supportive environment for adolescents. Through this process, both parents and adolescents can learn to be open in expressing their views or opinions, leading to a closer and more understanding relationship [45].

Action

Action is a key element that influences an individual's decision to engage in an activity, often manifested in the form of social actions that involve considerations of behavior and orientation towards others. In this context, action not only includes activities that are directly observable but can also encompass more complex manifestations of attitude, thus becoming a tangible act that can be observed [46].

The results of the statistical test on the pretest-posttest action scores between the experimental group and the control group showed a significant result with a p-value of 0.002 ($p<0.05$), meaning there is a significant difference in action scores between the experimental group and the control group before and after the intervention. This indicates that the interpersonal communication method is more effective in changing actions in the experimental group compared to the control group.

A study conducted by Fitriadi [47] showed a significant relationship between interpersonal communication by healthcare workers and hypertension prevention actions among patients at the Puskesmas Gadang Hanyar Banjarmasin, with a p-value of 0.000. This research found that interpersonal communication contributed 95.9% to the success of hypertension patients in implementing preventive measures. This suggests that effective communication is a crucial factor in managing hypertension [47].

Clear communication that is easy for respondents to understand can encourage them to follow the information presented. Respondents who feel comfortable consulting healthcare workers are more likely to regularly check their blood pressure every month. When healthcare workers provide detailed explanations about the importance of preventing blood pressure elevation, patients are more likely to

understand the information and take the necessary preventive actions [47].

This finding is consistent with research by Wijayanti [48], which showed that interpersonal communication has a positive and significant influence on adolescent behavior. Based on the analysis results, the value ($R = 0.881$, $F = 106.779$, and $p<0.01$). Overall, interpersonal communication contributes 65.8% to the formation of adolescent behavior [48].

Interpersonal communication serves as a means to build harmonious relationships between individuals. There are five indicators of effective communication: understanding, pleasure, influence on attitudes, relationship quality improvement, and action. Therefore, when someone is able to choose the right words, prepare adequately, and deliver a message well, the results of the communication can reach a high level of effectiveness [48].

The Effect of Interpersonal Communication on Knowledge, Attitude, and Action in Hypertension Prevention

During adolescence, interpersonal communication skills are essential as they contribute to identity formation and social relationships. Interpersonal communication is considered effective in influencing behavior in adolescents because there is an active exchange of information, clear expression of thoughts and emotions, and a supportive relationship. By emphasizing skills such as empathy, problem solving, and adaptation in interactions [49].

According to the theory of interpersonal communication put forward by Devito [50] states that the message conveyed by the communicator to the communicant will produce feedback which can be positive, negative, or neutral. This type of feedback is strongly influenced by the way the communicator conveys the message. If the message is delivered in an interesting way, communicants tend to be more open to receiving the message effectively [50].

During the 29-day period without intervention after one day of intervention implementation, there are a number of external factors that can influence changes in an individual's knowledge, attitudes and actions related to hypertension prevention. One such factor is personal experience and social environment, where interactions with family, friends, or community members who have experience or knowledge of hypertension can influence an individual's attitudes and actions. For example, witnessing a family member suffering from hypertension can increase awareness and encourage preventive behavior. In addition, exposure to information through mass media, such as television, radio, internet, or print media, also contributes to increased knowledge. Health campaigns or news that discuss the dangers of hypertension can shape better attitudes and prevention behaviors [51].

Another factor that comes into play is local culture and customs. The culture in which we grow and develop greatly influences our knowledge. If an area has a culture that emphasizes the importance of maintaining health, this is likely to have an impact on the formation of individual attitudes and behaviors [52].

Support from family and interactions with health workers also have a big influence. Supportive families and proactive health workers who provide information can motivate individuals to take more effective preventive measures. By understanding these factors, a more comprehensive evaluation of the effectiveness of interventions can be made while considering the influence of the environment on individual behavior change in hypertension prevention [53].

Interpersonal communication failure can occur when a person avoids interacting with others, which results in the message not being received properly. If communication and interpersonal relationships are not well established, the impact will be felt by the individual [54].

Effective communication is influenced by openness, empathy, support, and equality. These aspects build a mutually supportive relationship between communicators and communicants, so that communication patterns become optimal and messages are received positively. Openness in interpersonal communication involves a willingness to share information, express feelings and thoughts, and take responsibility for them. This creates more meaningful interactions and supports success in delivering messages [55]

This is in accordance with research conducted by Fikrina *et al*. [56] on early adolescents in Doro District, Pekalongan Regency which discusses the relationship between behavior and interpersonal communication between parents and children. The study found a significant negative relationship, where the lower the quality of interpersonal communication between parents and children, the higher the negative behavior, and vice versa, the better the communication, the lower the tendency to behave negatively [56].

Interpersonal communication is more influential than other forms of communication in changing the attitudes, beliefs, opinions, and behavior of communicants. This is due to the nature of interpersonal communication that takes place face-to-face, which allows direct personal contact. With this contact, feedback can be received instantly, allowing the communicator to immediately know the communicant's reaction to the message conveyed [57].

Thus, interpersonal communication skills are instrumental in adolescent development, especially in improving adolescent behavior in preventing health problems. Effective communication, which involves aspects such as openness, empathy and equality, can support positive behavior change. Given the importance of interpersonal communication in influencing knowledge, attitudes and actions to prevent hypertension, the role of the communicator and the response of the communicant are key in creating effective communication in adolescents. Therefore, the development of good interpersonal communication skills is essential to build harmonious relationships and support optimal adolescent behavioral development.

LIMITATIONS OF THE STUDY

1. This study was only conducted in two schools, so the results cannot reflect the overall adolescent population.
2. The intervention was conducted in only one meeting and with a limited period of time, so it cannot measure long-term effects.
3. This study only measured knowledge, attitudes and actions without considering other external factors that may be influential, such as family support or social environment.
4. Blood pressure measurement was not conducted in this study, so it cannot provide information on changes in hypertension status.

CONCLUSION

Based on the research conducted, it can be concluded that the interpersonal communication approach applied in the intervention proved to have a more significant effect than counseling in improving students' knowledge, attitudes, and actions related to hypertension prevention. The results showed a significant increase in all three aspects in the experimental group that received interpersonal communication intervention. The increase in knowledge about hypertension was followed by positive attitude changes and better preventive actions after interpersonal communication was given. These findings support the importance of using more personalized and interactive communication methods to encourage better behavior change in hypertension prevention. Therefore, this approach can be considered as an effective alternative in health education for hypertension prevention in adolescents.

Health workers at health centers are expected to integrate interpersonal communication approaches in health education programs, especially those that focus on hypertension prevention. With a more personalized approach, health workers can help people understand the importance of hypertension prevention, such as maintaining a diet, exercising regularly, and managing stress. Specific training on interpersonal communication skills needs to be provided to health center health workers so that they are able to deliver health information clearly, empathetically, and effectively. health information clearly, empathetically, and responsively to the needs of the community in their working area.

Suggestions for schools, through the School Health Enterprise, are expected to actively facilitate and implement health education programs that focus on hypertension prevention. This program can include regular education on healthy eating, the importance of physical activity, and stress management, which can be delivered through various activities such as seminars, workshops, and hypertension prevention campaigns. In addition, schools can also organize periodic health checks, including blood pressure measurements, as part of the school health effort program for early detection of health problems. Health materials related to hypertension can also be integrated into the curriculum and extracurricular activities. Schools can also provide facilities to support healthy lifestyles, such as healthy canteens, sports facilities and relaxation rooms.

Future researchers are expected to expand the scope of research by considering various factors that can influence adolescent behavior, such as social, environmental, and psychological factors, which may play a role in the development of healthy behaviors related to hypertension prevention. In addition, it is recommended to focus on long-term interventions that involve families and communities, so as to encourage changes in healthy behavior that are more sustainable and have an impact on the quality of life of adolescents.

ETHICAL APPROVAL

This study has received ethical approval from the Health Research Ethics Committee (KEPK) of the Faculty of Public Health, Hasanuddin University, with approval number 2946/UN4.14.1/TP.01.02/2024 dated October 8, 2024.

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