



# The Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Girls in Man Insan Cendekia Gorontalo

Nurmelisa R. Djaini<sup>1\*</sup>, Ika Wulansari<sup>2</sup>, Nirwanto K. Rahim<sup>3</sup>

<sup>1,2,3</sup> Jurusan Keperawatan, Fakultas Olahraga Dan Kesehatan, Universitas Negeri Gorontalo

\*Corresponding Author: E-mail: [nurmelisard@gmail.com](mailto:nurmelisard@gmail.com)

## Article Info

### Article history:

Received 02 Oct, 2025

Revised 21 Nov, 2025

Accepted 27 Dec, 2025

### Keywords:

Education, Knowledge, Puberty, Adolescence, Secondary Sex

## ABSTRACT

In adolescence, a person experiences rapid development both physically, psychologically and socially. The most noticeable changes are physical changes that occur naturally and sometimes adolescents are unaware of these changes. Changes in puberty are related to the maturity of the reproductive organs, physical and sexual maturity, one of which is the development of secondary sex, but many adolescents do not know about the development of secondary sex, therefore, there is a need to make efforts to increase adolescent knowledge, one of which is by providing education. This study aims to analyze the effect of providing education about secondary sex changes during puberty on knowledge in adolescent girls at Man Insan Cendekia Gorontalo. The design of this study uses quantitative research using pre-experiment with a pre-test-post test without control group design. The population in this study is 60 young women at MAN Insan Cendekia. The sample was taken using the purposive sampling technique with a total of 38 respondents who met the inclusion criteria. The level of knowledge was measured using a knowledge questionnaire instrument. Data analysis was conducted using a paired t-test. The results of the study found that the p-value = 0.000 (<0.05), so it can be concluded that there is an effect of providing education about secondary sex changes during puberty on knowledge in adolescent girls at Man Insan Cendekia Gorontalo. The conclusion is that education about secondary sex changes significantly increases adolescents' knowledge of secondary sex development as it relates to their physical development.

## INTRODUCTION

Adolescence is a phase of a person's development in the age group of 10 to 18 years. Adolescence is an important period in a person's life, in which significant changes towards adulthood occur, characterized by various physical, psychological, and social changes as well as the development of reproductive organs (Ministry of Health, 2023).

According to *World Health Organization* (WHO, 2024) The prevalence of adolescents according to WHO is around one-fifth of the world's population is adolescents, while in Indonesia according to UNICEF (2021) two-thirds of Indonesia's population of 270 million people (17%) are adolescents with a population structure of 48% women and 52% men.

The National Central Statistics Agency (2023) recorded the number of adolescents in Indonesia with an age range of 10 - 19 years as many as 44.25 million people (Ministry of Health of the Republic of Indonesia, 2024) The results of the Indonesian Youth Demographics and Health Survey (SDKI-R) stated that 13.3% of adolescent girls did not know at all about their physical changes during puberty. In fact, almost half (47.9%) of young women do not know the time of puberty (BKKBN, 2021).

Based on data from the Gorontalo central statistics agency, Gorontalo population data in general shows a population of 1,392,737 people in 2024, of which 28.7% are teenagers or a total of 399,716 people (BPS,

2023). Based on data from the Gorontalo Provincial Health Office in 2025, in 2024 The number of adolescents aged 15–24 years who receive counseling about Reproductive Health (Kespro) and HIV/AIDS by Regency or City in Gorontalo Province is 16,092 adolescents (Gorontalo Provincial Health Office, 2024)

In adolescence, a person experiences rapid development both physically, psychologically and socially. The most noticeable changes are physical changes that occur naturally and sometimes adolescents are unaware of these changes. Changes during puberty are related to the maturity of the reproductive organs (Rasyid, 2020).

Puberty is the process of changing physical and sexual immaturity to physical and sexual maturity. The phase of physical and sexual maturity can make the reproductive organs of an adolescent can function to reproduce. Puberty is characterized by the maturation of the primary and secondary sex organs, where the condition is influenced by the maturity of sexual hormones. Primary sex in puberty is characterized by the occurrence of *menarche*, and secondary sex can be seen from changes in the physical maturity of reproductive organs such as breast enlargement, growth of armpit hair and pubic organs, acne, voice changes, enlarged hips and also the development of several vital organs that are ready to be fertilized (Minarsih, 2022).

Puberty is an important time in a teen's life that needs to be understood. Understanding puberty helps adolescents deal with the physical, emotional, and social changes that occur during this time, therefore it is important for adolescents to know about physical changes during puberty because adolescence is a period of *Stress Full* Due to physical and biological changes as well as changes from the environment, a process of self-adjustment from adolescents is needed. At puberty the teenager will tend to wonder if the change is normal, whether everyone experiences it, what they should do with the existing changes, therefore it is necessary to be educated early on regarding changes in secondary sex in adolescents by health workers and related educators (Sahni et al., 2023).

Providing education to adolescents will help adolescents to improve their knowledge, attitudes and behaviors. By providing education, it is hoped that it can increase knowledge and awareness among young women about the importance of recognizing the signs of secondary sex during puberty. A better adolescent's knowledge will have a great influence on positive attitudes in dealing with secondary sex development. Adolescent girls' knowledge of puberty, especially secondary sex development, is an indicator in achieving the success of an educational process, namely the increase in individual knowledge and attitudes that are applied in daily life (Rasyid, 2020).

The impact of adolescents who do not get early education about secondary sex development in their developmental phase will cause low knowledge of adolescent girls so as to increase great curiosity and adolescents will try to find various information about the changes experienced, and this will cause responses and risky behaviors, if adolescents get inappropriate information about reproductive health will cause many adolescents to experience adolescent problems such as *free sex* , out-of-wedlock pregnancies, sexually transmitted diseases to HIV/AIDS (Rohmaniah, 2022).

Research conducted by Yula, (2022), on "The Effectiveness of Education on Secondary Sex Changes in Puberty on Knowledge in Adolescent Girls at SDN 003 Palangga" shows that the provision of education is effective in increasing knowledge about secondary sex changes during puberty to knowledge in adolescent girls at SDN 003 Palangga.

Based on the initial data collection of researchers at MAN Insan Cendekia Gorontalo, there will be as many as 60 adolescent female students in 2025. Based on the results of interviews with 10 female students, as many as 7 of them said that they did not know and understand well about breast size, pelvic and buttock enlargement, voice changes, hair growth around the genitals so that they felt anxious and embarrassed and uncomfortable with it, besides that they did not feel ready for it because their parents never provided related information. When students ask questions, parents say it is not appropriate to ask at this age. Students also feel that it is inappropriate to talk about this with their peers so that students only look for this information on the internet.

Interviews with three other students said that they had learned about developments related to physical reproduction such as breast size, pelvic and buttock enlargement, voice changes, hair growth around the genitals and that it was a normal thing that happened to women because they had previously been informed by their parents and family. The student said that it was a marker of the onset of puberty.

Apart from the problems obtained in the interviews and observations above, the reason why the researcher chose MAN Insan Cendekia, is due to the lack of adolescents, especially young women, exposed to information related to puberty and secondary sexual development because the institution may focus more on religious and character education than reproductive health, besides that students at MAN Insan Cendekia also enter dormitories and lack of interaction and teaching from parents about these matters. In addition, the lack of materials and experts who can provide adequate education on these sensitive topics causes low student knowledge. These limitations can lead to adolescents not being aware of physical changes and other health risks, potentially leading to future reproductive health problems.

Based on an interview with one of the teachers at the MAN school, Insan Cendekia said that there has never been any education given specifically to female students to increase knowledge related to the changes that occur during puberty, especially primary and secondary sex development. The teacher argues that it has been studied before in the subject of Biology although it is not specific.

In a preliminary study conducted by researchers at Madrasah Aliyah (MA) 1 Muhammadiyah Batudaa which is also a pesantren school, where based on interviews with 5 adolescent students, 3 of them said that they did not understand about secondary sex, which is related to voice changes, physical growth such as breasts, hips and buttocks, only understood that one of the signs of puberty is experiencing menstruation, While the other 2 have received previous education by parents about secondary sex related to physical changes, but do not know what to do next in response to the development of secondary sex, so students feel ashamed of the changes that occur in them. In addition, all students have also never received education related to secondary sex while at school.

## RESEARCH METHODS

### Research Design

This study is a quantitative research using a pre-experiment with a *pre-test-post test without control group* design. This design seeks to reveal cause and effect by involving groups in experimental groups. In both treatment groups, it begins with a measurement (*pre-test*) and after the administration of treatment, a re-measurement (*post test*) is held. This study aims to analyze the Difference in Knowledge Level Before and After the Provision of Secondary Sex Education at MAN Insan Cendekia.

The location of the research was carried out at MAN Insan Cendekia Gorontalo. The research implementation time lasted from October – December 2025. The sampling in this study uses *the purposive sampling technique*. sampling techniques of data sources with certain considerations. The sample consideration in this study is all female students who meet the criteria.

### Data Analysis Techniques

#### Univariate Analysis

To analyze or describe each research variable and produce a frequency distribution as well as a percentage of each variable. Variables are calculated and analyzed separately to produce a clear picture of the variable (Trisliatanto, 2020). In this case, the variable includes independent variables, namely Adolescent girls' knowledge of secondary sex changes during puberty before and after being educated.

#### Bivariate Analysis

Bivariate analysis is an analysis that is carried out to analyze the relationship between two variables. Bivariate analysis aims to see the influence between independent variables and related variables. The purpose of the bivariate analysis in this study was to analyze the knowledge of adolescent girls before and after being educated about secondary sex changes during puberty. Before the statistical test of the data of the same group, namely before and after the provision of education, a normality test was first carried out using *the shapiro wilk test* ( $n = 38 < 50$ ) where the data met the assumption of normality ( $p. value > 0.05$ ) so that the decision of the statistical test on the same data group was a paired t-test parametric test. If the results of the data analysis obtained a probability value *of the paired t - p test*  $\leq 0.05$ , then  $H_a$  was rejected and  $H_0$  was accepted, which means that there is an effect of providing education about secondary sex changes during puberty on knowledge in adolescent girls at MAN Insan Cendekia Gorontalo.

#### Statistical Hypothesis

$H_0$  : There was no effect of providing education about secondary sex changes during puberty on knowledge in adolescent girls at MAN Insan Cendekia Gorontalo.

$H_1$  : There is an Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Women at MAN Insan Cendekia Gorontalo

### Research Ethics

According to Notoatmodjo (2018), ethics is an ethical guideline that applies to every research activity involving researchers, the parties being researched (research subjects) and the community affected by the research. Ethics in conducting research are as follows:

## RESEARCH RESULTS

### Respondent Characteristics

#### Distribution of Characteristics of Young Women at MAN Insan Cendekia Gorontalo

Table 1. Distribution of Characteristics of Young Women at MAN Insan Cendekia Gorontalo

Respondent Characteristics	Classification	Frequency (n)	Present (%)
Age	14 Years	4	10.5
	15 Years	31	81.6
	16 Years	3	7.9
Classes	X	38	100.0
	<b>Total</b>	<b>38</b>	<b>100.0</b>

(Source: Primary data, 2025)

Based on the age group of respondents, the majority of respondents were in 15 years of adolescence as many as 31 people or (81.6%), with class X level of 38 people (100%).

### Univariate Analysis

#### Overview of Adolescent Girls' Knowledge Before Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia

Table 2. Overview of Adolescent Girls' Knowledge Before Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia

Yes	Knowledge Level	Frequency (n)	Present (%)
1.	Good Knowledge	5	13.2
2.	Sufficient Knowledge	18	47.3
3	Lack of Knowledge	15	39.5
	<b>Total</b>	<b>38</b>	<b>100%</b>

(Source: Primary Data, 2025)

Based on the table above, the majority of respondents had a sufficient level of knowledge of 18 people (47.3%), and the lowest was respondents with good knowledge of 5 people (13.2%).

#### Overview of Adolescent Girls' Knowledge After Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia

Table 3. Overview of Adolescent Girls' Knowledge After Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia

Yes	Knowledge Level	Frequency (n)	Present (%)
1.	Good Knowledge	19	50.0
2.	Sufficient Knowledge	16	42.1
3	Lack of Knowledge	3	7.9
	<b>Total</b>	<b>38</b>	<b>100%</b>

(Source: Primary Data, 2025)

Based on the table above, the majority of respondents have a good level of knowledge of 19 people (50%), and the lowest is respondents with less knowledge of 3 people (7.9%).

### Bivariate Analysis

#### Data Normality Test

Before bivariate analysis is carried out, a data normality test must be carried out before and after treatment. The data normality test is carried out to determine what test will be used. The results of the data normality test with *Shapiro wilk* ( $n = 38 < 50$ ) are as follows:

Table 4. Test of Normality of Knowledge Before and After Providing Education

Variable	Groups	Pre/Post	p. value
Young Women Knowledge	Intervention	Pre Post	0.119 0.070

\**Shapiro-wilk*

Based on table 4 above, it shows that the knowledge variable meets the assumption of normality ( $p$  value  $> 0.05$ ), so the test used in the paired group data (*pre - post test*) is a parametric *paired t-test*.

### **The Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Women at MAN Insan Cendekia Gorontalo**

Table 5 The Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Women at MAN Insan Cendekia Gorontalo

Groups	Groups	n	Red	SD	Differences	P (t)
Intervention	Pretest Posttest	38	9.26 11.34	2.049 1.893	- 2.08	0.000

(Source: Primary Data, 2025)

Based on table 5 above, it shows that before education was carried out using ppt media and *leaflets*, the average adolescent girl had a level of knowledge with a score of 9.26 (medium category), and after education was carried out, the average knowledge increased with a score of 11.34 (medium category), with a difference in knowledge increase of (2.08) points.

Based on the results of the parametric *paired t-test* statistical test, it shows that there is an Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Girls at MAN Insan Cendekia Gorontalo as evidenced by the *p. value* ( $0.000 < 0.05$ ).

## **DISCUSSION**

### **Overview of Adolescent Girls' Knowledge Before Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia**

The results showed that the majority of respondents had a sufficient level of knowledge of 18 people (47.3%), the researcher's assumption that adolescent girls today have understood that they are entering the developmental stage of puberty, understand that one of the signs of puberty is *menarche*, but still consider that *menarche* or menstruation is still secondary sex development, the increase in the size of the breasts, hips and buttocks is still considered normal, but weight gain, excessive sweat production and the onset of acne are considered to have less hygiene or *hygiene*.

According to (Sahni et al., 2023) Typical characteristics of adolescents during puberty include significant physical changes such as height growth, acne, and hair growth in certain areas, as well as hormonal changes that cause voice changes (becoming heavier in males) and increased sweat production and body odor. In addition, there are also emotional and mental changes, such as being more curious, emotions that go up and down, and the desire to be more independent, so that during puberty adolescents will tend to wonder if the change is normal, whether everyone experiences it, what they should do with the changes, therefore it is necessary to be educated early on regarding changes in secondary sex in adolescents by health workers and related educators.

At the level of understanding or understanding and intermediate awareness, not very basic (beginner) and not yet deep (expert), that is, already understanding the main concepts of a thing from learning or experience, being able to explain, but not yet able to analyze it in a complex way or apply it widely without guidance. This is the stage where one has passed through "knowing" and "understanding" but has not yet reached "analyzing" (Asiva Noor Rachmayani, 2022).

The research in line with the results above is a study conducted by (Widyastuti, 2021) which shows that the average knowledge of adolescent girls about secondary sex development still varies, with a significant percentage having knowledge in the "sufficient" category of 20 people out of 30 adolescent female respondents (66.6%), who do not fully understand physical changes such as breast growth, pubic hair, and body shape changes as part of puberty normal, which has the potential to cause anxiety and misconceptions about reproductive health.

In the group of respondents with less than 15 people (39.5%), based on the researcher's assumption this is associated with young women who do not currently know that they are in puberty, and do not know the secondary sex characteristics related to their physical and emotional development, adolescents become confused and do not

know about changes in voice, size of their breasts, the growth of acne on their faces, So that he always feels uncomfortable, sad, moody and says he is anxious about his current condition.

According to (Widyastuti et al., 2021), Adolescents who are unaware of the development of puberty tend to feel anxious due to ignorance of the physical and emotional changes that occur, making them feel confused, uncomfortable, and different from others. Puberty is accompanied by a surge in the hormones estrogen and testosterone that affect mood and behavior, causing changes *Moodquick* (irritable, sad, or offended). Without an understanding that this is a normal part of development, teens can feel overwhelmed or think they have a mental problem. This change can be a big stressor if it is not properly prepared through proper education, whether from parents, teachers, or people in their immediate environment.

In line with research conducted by (Rafsanjani, 2024), it shows that most of the respondents, namely 58 respondents (52.25%), have less knowledge about physical changes entering reproductive age or at puberty. Adolescents' lack of knowledge about physical changes can be influenced by several factors such as students who do not pay attention to learning when physical change or puberty material is explained at school, misinformation from peers, lack of information and parenting styles, and inaccurate information from the internet.

In the group of respondents with good knowledge, 5 people (39.5%). The researcher's assumption that this is associated with adolescent girls who before providing education already know about the changes that occur during puberty and physical growth related to the body and its reproduction during this period, this is also related to adolescent girls who have received information from their parents about primary and secondary sex development, or early sexual education, So that they feel that they already know and understand related to puberty and secondary sex, how the positive and negative impacts are caused and how to respond to the phase that they are currently going through.

According to (Princess, 2023) which states that early sexual education provided by parents significantly affects adolescent reproductive health knowledge and behavior. Adolescents who receive sexual education from these primary sources i.e. parents and families tend to have better knowledge and are more likely to engage in safer and responsible sexual behavior than their peers who do not receive it, in addition to having sufficient knowledge about the development of primary and secondary sex that has been taught from an early age makes adolescents not confused about what they will go through in the current phase of puberty.

A similar study conducted by Handayani (2021) shows that respondents in this case adolescent girls who often receive sexual education through their parents have a level of knowledge that is 9.01 times greater than respondents who do not often get sexual education through their parents.

Based on the description above, researchers can conclude that early sexual education by parents is closely and very important with adolescents' knowledge of secondary sex (more complex sexuality), because parents are the main educators who can equip adolescents with a healthy understanding of the body, prevent promiscuity, the dangers of early sexuality, sexually transmitted diseases (STDs).

### **Overview of Adolescent Girls' Knowledge After Being Educated on Secondary Sex during Puberty at MAN Insan Cendekia**

The results of the study showed that the majority of respondents had a good level of knowledge of 19 people (50%), based on the researcher's assumption that this is related to adolescent girls who after being given education knowledge and understanding related to secondary sex increases, where secondary sex development appears in the primary sex phase, understanding about the increase in pelvic size, hips and buttocks as a sign of sexual maturity, Hair growth in the sensitive area and armpits, voice changes, and weight gain and oil glands will be more active so that acne can appear at any time, so that adolescents do not look confused and realize and understand that their current growth and development is normal in the puberty phase.

In line with the theory that the provision of secondary sex education, often called comprehensive sexual and reproductive health education, will indeed significantly increase adolescents' knowledge. This comprehensive program aims to provide accurate, fact-based information on various aspects of sexuality and reproductive health, ultimately equipping adolescents with the knowledge to make informed and responsible decisions (Widyastuti et al., 2021).

The results of the research obtained are also supported by the opinion (Sari, et al, 2021) that adolescents' ability to think develops in such a way that they can easily imagine many problem-solving options along with possible impacts or outcomes. Adolescents no longer receive information as it is, but they will process it and adapt it to their own thinking. They can also integrate past and present experiences to transform them into conclusions, predictions, and plans for the future.

Providing education to adolescents will help adolescents to improve their knowledge, attitudes and behaviors. By providing education, it is hoped that it can increase knowledge and awareness among young women about the importance of recognizing the signs of secondary sex during puberty. A better adolescent's knowledge will have a great influence on positive attitudes in dealing with secondary sex development. Adolescent girls' knowledge of puberty, especially secondary sex development, is an indicator in achieving the success of an educational process, namely the increase in individual knowledge and attitudes that are applied in daily life (Rasyid, 2020).

Another study conducted by Putri, (2023) on "The Influence of Health Education on Sexual Knowledge in Adolescents" shows that knowledge about reproductive health in female students after counseling shows an increase when compared to previous knowledge with the results of knowledge before being given health education, respondents' knowledge is mostly in the good category, namely 2 respondents (10%) and after being given education The health knowledge of respondents was mostly in the good category, namely 29 respondents (85%) of the 34 respondents.

In a group of 16 people (42.1%), the researchers' assumptions related to this result were associated with adolescent girls who understood that at this time they were entering the developmental stage of puberty, understood that one of the signs of puberty was *menarche*, but still did not understand why the size of the breasts, hips and buttocks was enlarged so that it was still considered something less normal, weight changes that were easily increased at this time and still Less accepting of the change in his voice at this time. In addition, adolescent girls who are still in the range of knowledge have low grasp of the education provided by being passive or more silent during the evaluation session of the education provided by the researcher.

According to (Yula, 2022), that adolescence is a transitional period with rapid physical and hormonal changes, which sometimes make them feel uncomfortable or emotionally labile, thus affecting focus and participation. Teens may also feel less interested or unmotivated about certain subjects or topics, causing them to become reserved or passive. Young women also tend to think that sex is trivial and natural and does not need to be studied because it will be known as they grow older.

Parallel research conducted by (Wati, 2025) shows that it shows that secondary sex-related education is very effective in improving the understanding of reproductive organs, body changes, in adolescent girls but requires a continuous approach so that knowledge becomes "good" equally, such as per-individual counseling for adolescents in the puberty phase, which helps them understand, accept, and manage the physical changes of puberty (secondary sex characteristics) in a positive way positive, prevent risky sexual behaviors, build an understanding of reproductive health.

In the group with less knowledge of 3 people (7.9%), the researcher assumed that adolescents with less knowledge after being given education related to adolescents still considered that things related to sex were taboo so that adolescent girls were not interested at all in the education provided, paid less attention when the education took place, and considered that this was a personal matter that should be educated through counseling *face to face* is not by the lecture method, so that the absorption of information related to secondary sex is not optimal in adolescent girls who do not approve of the implementation of the education provided, the above is related to factors that affect the reception and acquisition of information in adolescents, which is related to attitudes in adolescents, or the way adolescents respond to the information provided, media that is considered less attractive, and the cultural system embraced by the teenager, which considers things about sex not to be something worth discussing in public.

In line with the theory that sex education is considered taboo due to the misconception that it is only about sexual relations and pornography, when in fact it is much broader. This is exacerbated by views that consider it contrary to religious and cultural values, as well as norms from previous generations that do not discuss it openly (Asiva Noor Rachmayani, 2022).

Parallel research conducted by (Rasyidin, 2024) shows that most parents consider sex education important, but not urgent, feel uneasy and lack a clear understanding of how to deliver sex education to children, considering sex to be equivalent to teaching children about sexual behavior.

Based on the description above, the researcher concluded that adolescents with low knowledge after being given education because they never received sex education from their parents, parents considered sex education taboo because of hereditary habits, shame and discomfort discussing intimate matters (fear of using vulgar terms), the assumption that sex is only for teenagers or adults, and the misperception that early sex education triggers sexual activity or deviance.

### **The Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Women at MAN Insan Cendekia Gorontalo**

This study began by measuring adolescents' knowledge related to secondary sex before education was carried out using video media and *leaflets* where the average adolescent girl had a level of knowledge with a score of 9.26 (medium category), where based on the findings of adolescent researchers who have not been exposed to secondary sex at all still consider that secondary sex is an abnormal thing, adolescents tend to be embarrassed by the secondary sex changes that occur and wonder how best to respond to the development of sex that occurs in the current phase of puberty, then the researcher provides an intervention in the form of educational *leaflets* at the first meeting on Secondary Sex Changes During Puberty which is given with a duration of  $\pm$  30 minutes, and closed by providing education using video media at the second meeting, which  $\pm$  the implementation lasted 20 minutes for a period of 1 week with 2 educational provisions, with the first meeting being education with *leaflet media* and the second meeting providing education with video media.

After education was carried out within 1 week, a measurement of adolescent knowledge was carried out after a series of educational activities of the second meeting was carried out and the average knowledge

increased with a score of 11.34 (medium category), where adolescent girls understood the development of secondary sex appearing in the post-primary sex phase, understood about the increase in pelvic size, hips and buttocks as a sign of sexual maturity, Hair growth in the sensitive area and armpits, voice changes, and weight gain and oil glands will be more active so that acne can appear at any time, so that adolescents do not look confused and realize and understand that their growth and development are currently normal in the puberty phase, with a difference in knowledge increase of (2.08) points. Adolescent girls were evaluated regarding their knowledge of secondary sex development that had been taught and the collection of research documentation with all respondents at the end of the research series.

In a study with the average adolescent who experienced knowledge from less to enough to show the knowledge of young women who understand that at this time they are entering the stage of development of puberty, understanding that one of the signs of puberty is *menarche*, but still considers that *menarche* or menstruation is still secondary sex development, the increase in the size of the breasts, hips and buttocks is still considered normal, However, weight gain, excessive sweat production and the onset of acne are considered to have poor hygiene or *hygiene*, and after education on knowledge and understanding related to secondary sex increases on average, where the development of secondary sex appears in the primary sex phase, understanding about the increase in the size of the pelvis, hips and buttocks as a sign of sexual maturity, Hair growth in the sensitive area and armpits, voice changes, and weight gain and oil glands will be more active so that acne can appear at any time, so that adolescents do not look confused and realize and understand that their current growth and development is normal in the puberty phase.

According to (Rahma, 2023) that education about secondary sex development has a very significant influence, not only on medical aspects, but also on adolescents' mental health and social behavior. The most direct influence is normalization. Without sufficient education, adolescents often perceive physical changes as abnormalities or diseases, the effects of which can reduce levels of stress, embarrassment, and *body dissatisfaction*. Adolescents who understand that these changes are normal phases tend to be more confident. Secondary sex education is also influential as far as character formation and self-protection are concerned. It not only informs about hormonal-related physical growth but provides a tool for teens to navigate adulthood physically and mentally healthy.

In adolescents with less than average knowledge after being given enough education, this is influenced by the information about secondary sex that adolescents need to be fulfilled, where so far adolescents are confused and do not understand secondary sex, how to deal with it, wonder if this is something normal at their age, and whether the impact of the development of this secondary sex is, However, after being given education, adolescent knowledge has increased with an average of sufficient knowledge, because adolescents have enough knowledge related to secondary sex development as a whole, both its signs and how to deal with it, but adolescents still do not understand related to the function of breast size increase at their current age, so adolescents become less confident and still seem to ask a lot of questions to researchers related to sex development secondary at this time.

In the group that after being given education, there are still 3 people who lack knowledge, this is caused by adolescents with less knowledge after being given education related to adolescents who still consider that things related to sex are taboo so that young women are not interested at all in the education provided, do not pay attention when the implementation of education takes place, and considers that this is a personal matter that should be educated through *face-to-face counseling* rather than by the lecture method, so that the absorption of information related to secondary sex is not optimal in adolescent girls who do not agree with the implementation of the education provided, the above is related to factors that affect the reception and acquisition of information in adolescents, which is related to attitudes in adolescents, or the way adolescents respond to the information provided, the media that is considered less attractive, and the cultural system embraced by the adolescent, which considers things about sex not to be worth discussing in public.

According to (Lesmana, 2021) that adolescent shyness to talk about sexual development, both secondary and primary, is a very common phenomenon. This usually occurs due to a combination of developmental psychological factors and the influence of the social environment. In many societies, sexuality is still considered private, secret, or even dirty. Adolescents pick up on these signals from the adults around them. If this topic is rarely discussed openly at home or at school, adolescents will feel that talking about it is an act that violates the norm. Teenagers care a lot about their self-image. They are often afraid that if they ask questions or tell stories, they will be considered too quick to mature or "dirty minded", strange or abnormal if their body development is different from their peers, and stupid because they do not know things that they are considered "supposed to know".

Based on the results of the parametric *paired t-test* statistical test, it shows that there is an Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Girls at MAN Insan Cendekia Gorontalo as evidenced by the *p. value* ( $0.000 < 0.05$ ).

As a result of the above research, in line with research conducted by Yula, (2022), showed that the provision of education was effective in increasing knowledge about the secondary sex changes during puberty to knowledge in adolescent girls at SDN 003 Palangga.

Puberty makes a child have the ability to reproduce. When entering puberty, girls will experience menstruation as a sign that their reproductive system is active. In line with that, adolescents will also experience physical changes, namely breasts begin to develop, pelvis begin to enlarge, acne and hair growth in the pubic area. Meanwhile, in boys, changes in the voice will be seen, the growth of mustaches, the genitals become larger, the muscles enlarge. The appearance of acne as well as other physical changes. Their physical form will change rapidly from the beginning of puberty and will bring them into the world of adolescence.

Health education has a basic concept such as the learning process, from those who do not know about health values to know, and from those who are unable to overcome health problems to those who are able. Health counseling is a way to increase knowledge that is useful for obtaining health information. The provision of health counseling can be done using interesting media such as *leaflet* and *Power Point*. In general, the purpose of health education is to improve the ability of the community to maintain and improve a person's ability to maintain and improve the degree of health, both physical, mental and social so that they are economically and socially productive (Talibo 2023).

Media leaflets and *Power Point Slides* which is direct in the form of real objects or reality that can be used to achieve the optimal of the teaching and learning process. Understanding the role of media is important in the process of gaining learning experiences for students. The learning experience can be through the process of doing or experiencing what is learned, the process of observing, and listening through certain media and the process of listening through language. The more concretely we learn the teaching materials, for example through direct practice or simulation through the health education provided, the more practice and experience we gain. On the other hand, the more abstract we get experience, for example relying only on verbal language, the less experience we will gain (Ernasari, Kaelan, and Nurdin 2021).

In addition, the researcher also uses video media, where video as an educational medium is to improve memory and understanding through a combination of visual-audio, make learning more interesting and not boring, support flexibility (independent learning, repeatable), facilitate the understanding of abstract/complex material with real examples, and reach various learning styles (visual, auditory, kinesthetic) (Princess, 2023).

Research conducted by (Tanjaya, 2025), shows that videos used to improve adolescents have proven to be more effective than using *Power Point*, video media can attract students' attention, increase knowledge, imagination, think critically, make students more involved, more excited so that they can take initiative in the learning process, where in the results of the *independent t-test* scores are obtained *P-value* ( $0.000 < 0.05$ ) which means that there is a significant difference in adolescents' knowledge related to reproductive health in adolescents who are given videos compared to adolescents who are given *power points* and *leaflets*.

Providing education to adolescents will help adolescents to improve their knowledge, attitudes and behaviors. By providing education, it is hoped that it can increase knowledge and awareness among young women about the importance of recognizing the signs of secondary sex during puberty. A better adolescent's knowledge will have a great influence on positive attitudes in dealing with secondary sex development. Adolescent girls' knowledge of puberty, especially secondary sex development, is an indicator in achieving the success of an educational process, namely the increase in individual knowledge and attitudes that are applied in daily life (Rasyid, 2020).

The impact of adolescents who do not get early education about the development of secondary sex in their developmental phase will cause low knowledge of adolescent girls so as to increase great curiosity and adolescents will try to find various information about the changes experienced, and this will cause risky responses and behaviors, if adolescents get inappropriate information about reproductive health will cause many adolescents to experience adolescent problems such as *free sex*, out-of-wedlock pregnancies, sexually transmitted diseases to HIV/AIDS (Rohmaniah, 2022),

Based on the above description, researchers conclude that providing secondary sex education to adolescents is essential because it equips them with knowledge about the physical and psychological changes of puberty, helps build healthy relationships, prevents risky behaviors (such as premarital sex and STDs), overcomes myths, and forms an understanding of personal consent and boundaries, all of which are crucial for long-term physical and emotional health. Without this education, adolescents are vulnerable to seeking out misinformation from uncredible sources, which can negatively impact their health and well-being.

## CONCLUSION

The majority of respondents' knowledge before being given education about secondary sex development was on average with a sufficient level of knowledge of 18 people (47.3%), and the lowest was respondents with good knowledge of 5 people (132%)

The majority of respondents' knowledge after being given education about secondary sex development was on average with a good level of knowledge of 19 people (50%), and the lowest was respondents with less knowledge of 3 people (7.9%).

The results of the statistical test obtained a value of  $p = 0.000a < 0,05$ , so it can be concluded that there is an effect of providing education about secondary sex changes during puberty on knowledge in adolescent girls at MAN Insan Cendekia Gorontalo.

**SUGGESTIONS**

For nurses, it is hoped that the results of this study can be a reference in improving education about reproductive health in adolescent girls, as well as to further improve the provision of education to improve the understanding of reproductive health in adolescents.

For Education and Health agencies, it is hoped that the results of this research are expected to be considered and additional information for nursing majors in increasing adolescent knowledge related to reproductive health and secondary sex development.

For future researchers, it is hoped that this research can be used as a reference and reference for further research. The need to be researched related to different media in improving secondary sex knowledge in adolescent girls such as the use of *e-modules* and learning applications. The next researcher is expected to expand the scope of variables, increase the number of respondents, or use research methods such as taking several different high schools with the *cluster sampling* method so that more comprehensive results and stronger generalizations are obtained.

**BIBLIOGRAPHY**

Asiva Noor Rachmayani. (2022). *Comprehensive Sexual Education for Premarital Sexual Behavior Prevention*. Indonesian Science Media.

BKKBN. (2021). Regulation of the National Population and Family Planning Agency Number 3 of 2020 concerning the Implementation of Government Affairs in the Field of Population Control and Family Planning in the Regions. *Indonesia*, 129.

BPS. (2023). *Child and Adolescent Population Statistics. Sec. 112*.

Dila Rukmi Octaviana, R. A. R. (2021). Human Nature: Knowledge (Knowladge), Science (Science), Philosophy and Religion. *Journal of Tawadhu Vol. 5 No. 2, 2021, 5(2)*, 143–159.

Health Office. 2025. Health Profile of Gorontalo Province. Gorontalo: Gorontalo Provincial Health Office.

Eravianti. (2021). *Health Research Methodology*.

Fidora, I., Oktarini, S., & Prima, R. (2021). Physically and psychologically ready to face puberty. *Journal of Mutual Aid*, 1(1), 6–10. <https://doi.org/10.31869/jsam.v1i1.2817>

Hamidah, S., & Rizal, M. S. (2022). Reproductive Health and Adolescent Development Education at Muhammadiyah Orphanage, Gresik District, Gresik Regency, East Java. *Journal of Community Engagement in Health*, 5(2), 237–248. <https://doi.org/10.30994/jceh.v5i2.384>

Ministry of Health of the Republic of Indonesia. (2024). *Analysis of Adolescents in Indonesia*.

Grass, W. O. N. (2022). Level of Knowledge of Physical Changes in Puberty in Young Women. *Journal of Midwifery*, 9(1), 18–23. <https://doi.org/10.48092/jik.v9i1.182>

Notoatmodjo, S. (2021). *Health Research Methodology*. Our Writing Foundation.

Finished Aprillia, Nadia Gufran, & Linda Yarni. (2024). The Development of Puberty. *Guruku: Journal of Education and Social Humanities*, 2(3), 261–275. <https://doi.org/10.59061/guruku.v2i3.730>

Princess. (2023). The Effect of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Women. *Indonesian Health Scientific Journal*, 8(2), 32–39. <https://doi.org/10.51933/health.v8i2.1135>

Ridwan. (2021). An Analytical Study of the Meaning of Knowledge and Science and Its Types and Sources. *Journal of Geuthèè: Multidisciplinary Research*, 4(1), 31. <https://doi.org/10.52626/jg.v4i1.96>

Rohmania, Inayah, S. (2022). *In the face of physical changes during puberty at the Al-Baqiyatussholihat*.

Saat, S., & Mania, S. (2019). *Introduction to Research Methodology : A Guide for Beginner Researchers*. The Legacy of Almaida.

Sahni, K., Laiyina, S., & Risan, S. (2023). Adolescent Reproductive Health in Puberty on the Improvement of Knowledge of 4th Grade Students of Sdn Cempaka Putih Timur 01. *National Seminar on Community Service*, 3, 6.

Saputro, A. A. N. P., Chaerunisa, R., Haya, N. D., Pardede, P. I., Anilah, N. G., & Hendriyani, M. E. (2023). Puberty Preparation Education Reviewed from the Perspective of Biology and Islamic Religion in Grade 6 Students of Sdn Serang 05. *Journal of Community Service of Mathematics and Natural Sciences Education*, 7(1), 42–50. <Https://Doi.Org/10.21831/Jpmmp.V7i1.51939>

Sari, N. I., Engkeng, S., Rahman, A., Health, F., University, M., Ratulangi, S., Abstract, M., Key, K., Health, P., & Keras, M. (2021a). The Effect of Health Counseling on Students' Knowledge and Attitudes about the Dangers of Liquor at the Kalasey State Development Agricultural Vocational School, Minahasa Regency. *KESMAS Journal*, 10(5), 46–53. <https://ejournal.unsrat.ac.id/v2/index.php/kesmas/article/view/35110>

Sari, N. I., Engkeng, S., Rahman, A., Health, F., University, M., Ratulangi, S., Abstract, M., Key, K., Health, P., & Keras, M. (2021b). The Effect of Health Counseling on Students' Knowledge and Attitudes about the Dangers of Liquor at the Kalasey State Development Agricultural Vocational School, Minahasa Regency. *KESMAS Journal*, 10(5), 46–53.

Sofiyatun. (2020). The Relationship of Triage Knowledge and the Level of Patient Handling Speed in the Emergency Room of Baladhika Husada Hospital Jember. *Manuju Publishing Journal*, 5(2).

Trisliatanto. (2020). *Research Methodology - A Complete Guide to Research Easily*.

WHO. (2024). *World Health Organization*. WHO United Nations ESCAP. (2024). Teen of Well Being- World Health Organization. WHO.

Widyastuti, A., Anggraini, R. P., & Mursudarinah, M. (2021). The level of knowledge of adolescent girls about the changes in puberty fiik in junior high school students 5 Sukoharjo. *Journal of Nursing Duta Medika*, 1(2), 26–33. <https://doi.org/10.47701/dutamedika.v1i2.1594>

Yula, E. (2022). *The Effectiveness of Providing Education on Secondary Sex Changes During Puberty on Knowledge in Adolescent Girls at SDN 003 Palangga District*.

Yunita, D., Tiara, Marlinda, Nuria, & Sari, R. (2024). The relationship between nurses' knowledge levels and the development of adolescent girls' sexuality. *Journal of Health Systems Research*, 1(1), 1–12.