

## Differences in cognitive life skills, knowledge, and attitudes between primary school students

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### ABSTRACT

Adolescents who can think critically and make the right decisions reported delaying the practice of sexual pre-marital. This study describes the cognitive life skills, knowledge, and attitudes in the reproductive health context among primary school students. This research is a cross-sectional study conducted on 12.689 grade 4-6 primary school students in Semarang, Central Java, Indonesia. The Mann-Whitney U-test investigates the differences between male and female students' decision-making skills, critical thinking skills, knowledge, and attitude. Most children (62.1%) stated that deciding something was difficult. Only 36.8% of children get ideas from other people when having a task to do. There are differences in knowledge ( $p$ -value=0.000) and attitudes ( $p$ -value=0.000) about reproductive health, as well as critical thinking skills ( $p$ -value=0.002) between males and females. There is no significant difference between males and females in terms of decision-making skills ( $p$ -value=0.202). There are differences in knowledge and attitudes about reproductive health and critical thinking skills between male and female students. However, there is no significant difference between males and females regarding decision-making skills. The Ministry of Health should design a life skills education method for pre-pubertal children considering sex segregation.

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## 1. INTRODUCTION

Pregnancy at an early age is high-risk because it can endanger the mother's safety when the fetus is conceived. The reproductive organ of women who are under the age of 20 years are still not ready to overgrow the fetus [1]. Yearly, around 2.5 million women under 16 in developing countries deliver their babies [2], [3]. According to the United Nations Development Economic and Social Affairs, Indonesia is the 37th country with a high percentage of adolescent marriages. Indonesia also become the second highest of adolescents marriage in South East Asia [4].

Most of Indonesian female teenager who get pregnant at early age experienced their first pregnancy at the age of 14-19 years. Finally, there will be two choices that pregnant adolescents must encounter: continuing the pregnancy or aborting it. Both have an impact on health risks that may not be underestimated [5]. Adolescent abortion is a common procedure in Indonesia. About 8% of women have an abortion before age 19 due to unwanted pregnancy every year. The difficulty of obtaining legal abortion services for unmarried women encourages adolescents to have an unsafe abortion, such as taking pills or attending traditional quacks [5]. Continuing the pregnancy, adolescents have no readiness in coping the matters of reproductive health, maternal health, children health, mental, emotional, and socioeconomic. This has

resulted in increased fertility rates and long-term health impacts that must be faced by children and mothers, especially in Javanese society, which still adheres to a patriarchal system [6]. To understand and overcome the causes of health problems, we need to explore the condition of adolescents as early as possible.

There are 4.6% of Indonesian women who become pregnant at the age of <14 years, while the average age of women in Indonesia entering puberty is 12.5 years [7]. This means that 4.6% of women in Indonesia are pregnant at the age of 12.5-14 years. Only need 1.5 years for them to get pregnant since their first menarche. It means that sexual intercourse behavior is carried out immediately after the woman gets her period or even before. This is also proven by the Global School Health Survey data that 27.35% of junior high and high school students in Indonesia had been active in sexual intercourse before they were 14 years old [8]. According to the Indonesia Demographic and Health Survey, the percentage of adolescents who had sex for the first time between the ages of 15-19 increased from 59% in 2012 to 74% in 2017. Of 6% of adolescents reported their sexual debut when they were 11-14 years old, the average age at the beginning of puberty or the transition from childhood to adolescence[9].

This condition is very concerning because adolescents in the early stages of puberty do not have sufficient knowledge, attitudes, and life skills to make healthy decisions [9]–[11]. WHO has suggested the need to equip adolescents with cognitive life skills so that they can consider the long-term consequences of every decision they make [12]. Cognitive life skills are processes that occur in every human brain, including critical thinking skills to the skills to decide something in life. These cognitive life skills need to be developed so that children are ready to enter puberty and choose to remain abstinent during the teenage storms in their life [13]–[16]. Skilled adolescents have an impact on delaying the practice of sexual intercourse because they can think and make the right decisions when facing peer pressure [17].

Currently, the government still prioritizes adolescent reproductive health over pre-pubertal children. The absence of references related to cognitive life skills and understanding of reproductive health in pre-pubertal children makes researchers interested in understanding more about this matter. This study aims to describe the cognitive life skills, knowledge, and attitude toward reproductive health among primary school students in Central Java.

## 2. METHOD

This research is a cross-sectional study. The population are all elementary school students in grades 4-6 in Semarang, the capital city of Central Java Province, Indonesia, whose number is uncertain. With purposive technique sampling, this study's final sample comprised 12,689 respondents who met the criteria (primary students in grades 4–6, aged 9-11 years, lived in Semarang City) and completed the entire survey.

The variables of this study were student characteristics (sex and grade), cognitive life skills (critical thinking and decision-making skill), knowledge, and attitude about reproductive health. The instrument for measuring the variables of critical thinking [18] and decision-making skills [19] uses a questionnaire from Perkins and Mincemoyer, each consisting of 20 questions. We adopted the questionnaire and changed from a 5-point-Likert scale to a dichotomous question. This is due to the characteristic of respondents in Central Java who are reluctant to stand out, attract attention, or be different from others, so they will often select the answers that are in the medium scale (e.g., undecided, neutral, moderate, and sometimes) in selecting the answer. For example, two answer choices in critical thinking and decision-making skills questions are “yes” and “no”. The respondent is asked to select the answer closest to them if they found no answer. Before collecting the data, the questionnaire was tested first for validity and reliability to 30 elementary school children in grades 4-6 in Semarang Regency, one of the areas adjacent to Semarang City. The results of the trial stated that all questions can be used because they are valid and reliable.

The data were analyzed univariate to obtain a description of student characteristics, cognitive life skills, knowledge, and attitude about reproductive health. We also analyzed the data by bivariate (Mann Whitney U-test) to investigate the differences of each variable between male and female student. This research has received the approval of the ethics committee of the Faculty of Public Health Universitas Diponegoro through letter no 158/EA/KEPK-FKM/2021.

## 3. RESULTS AND DISCUSSION

The number of respondents in the study was almost balanced by age and gender. There were 49.1% male students and 50.9% female students who participated in this study. A total of 31% are 9 years old, 32.5% are 10 years old, and 36.5% are 11 years old as presented in Table 1. Table 2 (see Appendix) shows the univariate analysis of cognitive life skills among primary school student with answering “yes”. There are 4 variables we describe: children's critical thinking skill, children's decision-making skill, children's knowledge and attitude about reproductive health.

Table 1. Respondent characteristic

Characteristic	n	%
Sex		
Male	6,228	49.1
Female	6,461	50.9
Age		
9	3,937	31.0
10	4,125	32.5
11	4,627	36.5
Total	12,689	100.0

Children aged 9-11 years experience important development. This age is the last age range they are called children. In general, after this age they will experience puberty, which means they have entered the teenage phase with various changes [20].

Knowledge and attitudes of children are strongly influenced by their environment. This study reported that most of the children did not get enough information about reproductive health. Males are less aware of what puberty is and the characteristics of puberty in males and females. However, between men and women, it is still less than 50% who understand it all. Most children know the male and female genitalia, but many do not understand how pregnancy occurs. This is very worrying because they are in their pre-pubertal age, which means they will soon go through their teenage years with various changes. Children at this age develop curiosity and want to understand them. Parents become an important influence in their lives because of their increased intelligence and curiosity. Their growth is also shaped by friends and peers [21]. This then becomes a problem if the information they receive does not come from a trusted or valid source. Unfortunately, many parents are unable to communicate with their children intimately and well. Parents who are supposed to provide education are less skilled in conveying reproductive health information to their children [22]. Furthermore, children are more comfortable discussing with their friends who basically don't have adequate skills and knowledge [23].

According to Piaget, children in late childhood can do reasoning to solve a concrete/actual problem. Inductive reasoning develops at this time and the child is able to draw complete conclusions by inferring the relationship between two objects based on the relationship between each object and with other objects [24]. Therefore, the child's social environment needs to be considered in order to support children's behavior to be healthy. Although in small numbers, males feel that accessing pornography is a natural thing. Some of the females also agreed. Some children also do not have physical limitations in associating with friends of the same sex. In fact, some children also think that teenage pregnancy is a normal thing. Permissiveness can result in a child's tendency to engage in sexual activity [25]. Without the right information, children's dangerous behavior can plunge them into unwanted pregnancies, abortion practices, and early marriage. The impact of this condition is of course not only detrimental to health, but also poses a risk in education and the economy [26].

So that the situation does not get worse, children need to have qualified cognitive life skills. Based on Table 3, males lack good critical thinking skills compared to females. This can be seen from the fewer males who meet the requirements in the critical thinking skill component than females. Males are less sure that the information they receive or have is correct and feel less need for information to support their opinion. Critical thinking ability plays a big role in one's life. Previous research has stated that this skill is more powerful than a person's intelligence in making better life decisions [27]. Children who are skilled in critical thinking are also able to obtain higher learning outcomes [28].

Table 3. Mann Whitney U-test of differences in mean rank of cognitive life skills between male and female students

Cognitive life skill	Gender	Mean Rank	Z	Sig.
Critical thinking skill	Male	6.241.55	-3.164	0.002
	Female	6.444.72		
Decision making skill	Male	6.303.32	-1.275	0.202
	Female	6.385.18		
Knowledge	Male	6.167.24	-5.395	0.000
	Female	6.516.35		
Attitude	Male	6.162.17	-5.948	0.000
	Female	6.521.23		

This study found that there is no proportion that has a significant difference between male and female children in the component of decision-making skills. Compared to males, females are more influenced

by their parents' advice in making decisions. The home environment does contribute to the development of thinking skills. Children this age develop their ability to plan by making decisions about their daily activities. Parenting practices affect the speed at which children are allowed to take responsibility and plan their own activities [24]. Parents who do not control children's activities will create a dangerous environment for the child because the child is more likely to imitate the risky behavior of others [29]. The results of this study are also related to the culture in Central Java where parents, especially father/husband as the head of the household must respect their decisions by all other family members. Some Javanese people also still adhere to a patriarchal system where females do not have the same freedom as males [30].

There is no difference in decision-making skills between males and females. However, there are indications that the behavior of females and males poses a risk to their reproductive health. This is because most children have poor knowledge, attitudes and cognitive life skills. Critical thinking skills are related to children's ability to manage information and use it when needed. This skill will also affect one's decision to act [27].

#### 4. CONCLUSION

There are differences in knowledge and attitudes about reproductive health, as well as critical thinking skills between males and females. There is no significant difference between males and females in terms of decision-making skills. Ministry of Health should considering sex segregation in designing a method of life skills education for pre-pubertal children.

#### APPENDIX

Table 2. Univariate analysis of cognitive life skills among students with answering "Yes"

No	Variable	Male (n/% )	Female (n/%)	Total (n/%)
Critical thinking skill				
1	I think of possible results before I take action.	5,870 (46.3)	6,212 (49.0)	12,082 (95.2)
2	I get ideas from other people when having a task to do.	2,309 (18.2)	2,357 (18.6)	4,666 (36.8)
3	I develop my ideas by gathering information.	5,879 (46.3)	6,153 (48.5)	12,032 (94.8)
4	When facing a problem, I identify options.	5,856 (46.2)	6,153 (48.5)	12,009 (94.6)
5	I can easily express my thoughts on a problem.	5,006 (39.5)	5,261 (41.5)	10,267 (80.9)
6	I am able to give reasons for my opinions.	5,748 (45.3)	6,019 (47.4)	11,767 (92.7)
7	It is important for me to get information to support my opinions.	5,966 (47.0)	6,221 (49.0)	12,187 (96.0)
8	I usually have more than one source of information before making a decision.	5,667 (44.7)	5,955 (46.9)	11,622 (91.6)
9	I plan where to get information on a topic.	5,209 (41.1)	5,551 (43.7)	10,760 (84.8)
10	I plan how to get information on a topic.	5,685 (44.8)	5,936 (46.8)	11,621 (91.6)
11	I put my ideas in order by importance.	1,716 (13.5)	1,710 (13.5)	3,426 (27.0)
12	I back my decisions by the information I got.	5,559 (43.8)	5,862 (46.2)	11,421 (90.0)
13	I listen to the ideas of others even if I disagree with them.	5,398 (42.5)	5,674 (44.7)	11,072 (87.3)
14	I compare ideas when thinking about a topic.	5,618 (44.3)	5,825 (45.9)	11,443 (90.2)
15	I keep my mind open to different ideas when planning to make a decision.	5,618 (44.3)	5,825 (45.9)	11,443 (90.2)
16	I am aware that sometimes there are no right or wrong answers to a question.	5,126 (40.4)	5,351 (42.2)	10,447 (82.6)
17	I develop a checklist to help me think about an issue.	4,447 (35.0)	4,766 (37.6)	9,213 (72.6)
18	I can easily tell what I did was right or wrong.	4,907 (38.7)	5,117 (40.3)	10,024 (79.0)
19	I am able to tell the best way of handling a problem.	4,935 (38.9)	5,167 (40.7)	10,102 (79.6)
20	I make sure the information I use is correct.	5,962 (47.0)	6,274 (49.4)	12,236 (96.4)
Decision making skill				
1	I easily identify my problem.	5,217 (41.1)	5,454 (43.0)	10,671 (84.1)
2	I think about the problem before I take action.	5,836 (46.0)	6,171 (48.6)	12,007 (94.6)
3	I look for information to help me understand the problem.	5,895 (46.5)	6,191 (48.8)	12,086 (95.2)
4	I ask others to help me identify my problem.	4,214 (33.2)	4,198 (33.1)	8,412 (66.3)
5	I think about ways of dealing with my problem.	6,010 (47.4)	6,279 (49.5)	12,289 (96.8)
6	I think before making a choice.	6,034 (47.6)	6,325 (49.8)	12,359 (97.4)
7	I discuss choices with my friends before making a decision.	5,275 (41.6)	5,517 (43.5)	10,792 (85.1)
8	I discuss choices with my parents before making a decision.	5,919 (46.6)	6,224 (49.1)	2,143 (95.7)
9	I look for positive points of possible choices.	6,094 (48.0)	6,372 (50.2)	12,466 (98.2)
10	I look for negative points of possible choices.	3,359 (26.5)	3,350 (26.4)	6,709 (52.9)
11	I consider the risks of a choice before making a decision.	5,541 (43.7)	5,811 (45.8)	11,352 (89.5)
12	I consider the benefits of a choice before making a decision.	5,963 (47.0)	6,215 (49.0)	12,178 (96.0)
13	I make decisions based on what my parents tell me.	4,799 (37.8)	5,205 (41.0)	10,004 (78.8)
14	When faced with a decision, I realize that some choices are better than others.	5,621 (44.3)	5,843 (46.0)	11,464 (9.3)
15	I make a decision by thinking about all the information I have about the different choices.	5,841 (46.0)	6,078 (47.9)	11,919 (93.9)

Table 2. Univariate analysis of cognitive life skills among students with answering “Yes” (*Continue*)

No	Variable	Male (n/%)	Female (n/%)	Total (n/%)
16	I prioritize my choices before making a decision.	4,471 (35.2)	4,852 (38.2)	9,323 (73.5)
17	Before making another decision, I think about how the last one turned out.	5,650 (44.5)	5,974 (47.1)	11,624 (91.6)
18	I do think of past choices when making new decisions.	5,859 (46.2)	6,212 (49.0)	12,071 (95.1)
19	If I experience negative consequences, I change my decision the next time.	5,782 (45.6)	5,990 (47.2)	11,772 (92.8)
Knowledge of puberty				
1	Puberty is a transition from childhood to adolescence	6,166 (48.6)	6,418 (50.6)	12,584 (99.2)
2	Puberty signs in males			
	Wet dream	4,507 (35.5)	4,759 (37.5)	9,266 (73.0)
	Acne	3,099 (24.4)	3,146 (24.8)	6,245 (49.2)
	Muscle grows	2,594 (20.4)	2,750 (21.7)	5,344 (42.1)
	Hair grows in the armpits and pubic area	3,455 (27.2)	3,689 (29.1)	7,144 (56.3)
	Attracted to opposite sex	2,891 (22.8)	3,089 (24.3)	5,980 (47.1)
	Adam's apple gets bigger	3,286 (25.9)	3,579 (28.2)	6,865 (54.1)
	Voice breaks and deeper	3,904 (30.8)	4,023 (31.7)	7,927 (62.5)
	The size of the testicles increases	2,392 (18.9)	2,282 (18.0)	4,674 (36.8)
3	Puberty signs in females			
	Menstruation	5,618 (44.3)	6,021 (47.5)	11,639 (91.7)
	Acne	3,194 (25.2)	3,646 (28.7)	6,840 (53.9)
	Hips get bigger	2,948 (23.2)	3,111 (24.5)	6,059 (47.8)
	Hair grows in the armpits and pubic area	3,091 (24.4)	3,458 (27.3)	6,549 (51.6)
	Attracted to opposite sex	2,816 (22.2)	2,948 (23.2)	5,764 (45.4)
	f. Breast get bigger	3,641 (28.7)	4,126 (32.5)	7,767 (61.2)
4	Knowledge about menstruation			
	a. Blood through vagina (period)	5,202 (41.0)	5,721 (45.1)	10,923 (86.1)
	b. Starts at 11-15 years old	2,990 (23.6)	3,422 (27.0)	6,412 (50.5)
	c. Happen because of hormones change	2,553 (20.1)	2,871 (22.6)	5,424 (42.7)
	d. One-month normal cycle (21-35 days)	1,928 (15.2)	2,135 (16.8)	4,063 (32.0)
	e. Occur during 5-7 days	2,703 (21.3)	3,442 (27.1)	6,145 (48.4)
	f. Painful cramps in the tummy sometimes (dysmenorrhea)	2,908 (22.9)	3,680 (29.0)	6,588 (51.9)
5	A female who has never had a period can't get pregnant	3,976 (31.3)	4,466 (35.2)	8,442 (66.5)
6	Vagina is a female genitals	5,351 (42.2)	6,056 (47.7)	11,407 (89.9)
7	Penis is a male genitals	5,783 (45.6)	5,703 (44.9)	11,486 (90.5)
Attitude toward reproductive health				
1	It's okay for a kid my age to have a male/female friend.	338 (2.7)	226 (1.8)	564 (4.4)
2	With my opposite sex friend, it's okay for me to			
	a. Be a seatmate	2,875 (22.7)	2,777 (21.9)	5,652 (44.5)
	b. Play together	4,179 (32.9)	3,855 (30.4)	8,034 (63.3)
	c. Shake hand	3,095 (24.4)	2,906 (22.9)	6,001 (47.3)
	d. Be alone	114 (0.9)	56 (0.4)	170 (1.3)
	e. Hand in hand	229 (1.8)	170 (1.3)	399 (3.1)
	f. Cuddle up	92 (0.7)	56 (0.4)	148 (1.2)
	g. Touch the cheek	71 (0.6)	42 (0.3)	113 (0.9)
	h. Touch the lip	47 (0.4)	23 (0.2)	70 (0.6)
	i. Spank, pinch, touch the butt	38 (0.3)	26 (0.2)	64 (0.5)
	j. Kiss the cheek	42 (0.3)	24 (0.2)	66 (0.5)
	k. Kiss the lip	37 (0.3)	18 (0.1)	55 (0.4)
	l. Show body parts that are usually covered by clothing	47 (0.4)	33 (0.3)	80 (0.6)
3	It's okay for children at my age to access pornography	119 (0.9)	89 (0.7)	208 (1.6)
4	It's okay for middle/high school adolescents to get pregnant	137 (1.1)	98 (0.8)	235 (1.9)

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