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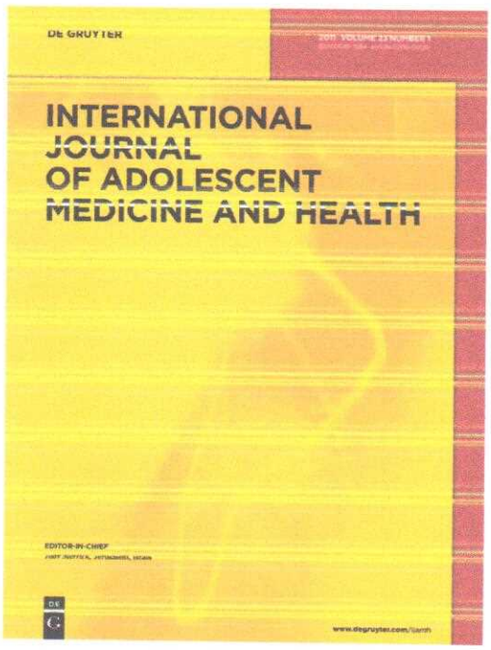

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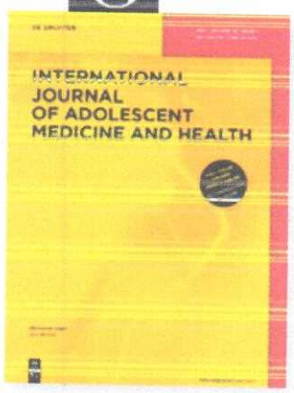

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Immaturity in puberty and negative attitudes toward reproductive health among Indonesian adolescents

Tantut Susanto / Ruka Saito / Syahrul / Rumiko Kimura / Akiko Tsuda / Noriko Tabuchi / Junko Sugama

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Abstract

Background:

Complex factors influence adolescents' attitudes. Secondary sexual development and emotional changes are markers of puberty and affect attitudes toward reproductive health (RH). This is especially evident in the society and culture of Indonesia. This study examined the presence of immaturity at puberty and factors associated with negative attitudes toward RH among Indonesian adolescents.

Methods:

We conducted a cross-sectional study with 1040 students (aged 11–16 years) selected using multistage random cluster sampling. Data were collected using a self-administered questionnaire that included the illustrative questionnaire for interview surveys with young people and the pubertal development scale (PDS), modified in accordance with the Indonesian context. Data analysis used descriptive and comparative statistics and logistic regression analyses.

Results:

Immature pubertal development was higher in boys [22.7%, 95% confidence interval (CI): 14.7%–30.7%] than girls (18.4%, 95% CI: 11%–25.7%). However, negative attitudes were higher in girls (40.6%, 95% CI: 34.3%–46.8%) than boys (37.1%, 95% CI: 29.9%–44.7%). Factors associated with negative attitudes toward RH in both boys and girls were age, RH communication with parents, and pubertal development. Smoking was an additional factor in boys, whereas living in an urban area was an additional factor in girls. High knowledge about RH was associated with less negative attitudes toward RH in both boys and girls.

Tantut Susanto*, Ruka Saito, Syahrul, Rumiko Kimura, Akiko Tsuda, Noriko Tabuchi and Junko Sugama*

Immaturity in puberty and negative attitudes toward reproductive health among Indonesian adolescents

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Conclusion: Immaturity and factors that influence negative attitudes toward RH should be explored during puberty. Improving knowledge about RH may help to prevent negative attitudes toward RH, especially for girls in urban areas and boys with smoking habits.

Keywords: adolescent development; attitudes; reproductive health; sexual development.

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Introduction

Puberty is a transition time from childhood to adulthood and is characterized by accelerated signs of growth and sexual maturation (1). Puberty has physical and psychological development dimensions, which vary depending on culture/ethnicity and other influencing factors (2). Previous studies have investigated factors associated with maturation in puberty. Nutrition (3), socio-economic status, and ethnicity (4) were associated with physical development, whereas family (5), mass media, peer experiences (6), and environment (7) were associated with psychological development.

Puberty usually begins between 8 and 14 years of age in girls, and 9 and 14 years of age in boys. The Tanner stages of development include the onset of growth of breasts, genitals, testicular volume, development of pubic hair, menarche, and nocturnal emissions (wet

Students were allocated code numbers and randomly selected using random number tables to reach the final sample of 1040 eligible participants. Eligibility criteria included students being of junior high school age, consent from parents or guardians for each student (after explanation of the study purpose, risks and benefits), the student being registered with the selected schools, and the student being able to understand and respond to survey questions. In this study, we excluded the adolescents with psychological disorders, based on the school health recorded in each school.

Ethical considerations

The study was approved by the Ethical Committee Review Boards of Indonesia (number: 545/H25.1.11/KE/2014). We also obtained ethical and administrative approval from the Department of Political Unity of the Protection of the Public and District of National Education and the schools' administration. We interviewed and informed school teachers about the study and then informed the students about the study in their classrooms. A letter was sent to the parents informing them about the study and inviting written informed consent if they agreed that their child could participate. After the permissions were received, the data collection plan was designed.

Measurement

Variables in this study consists of the independent, dependent, and confounding variables that are illustrated in the conceptual scheme as in Figure 1.

Measurement of independent variables

Data were collected with self-administered questionnaires. Pubertal development measures secondary sexual development and emotional changes in puberty. The questionnaires were based on the Tanner stages with physical measurements of development as external primary and secondary sex characteristics (e.g. breast size, genitals, testicular volume, and development of pubic hair) (28), and the pubertal development scale (PDS) (29). Both the Tanner stages and PDS identify on the timing of puberty.

We used PDS (29) and measured pubertal development with the Tanner stages and emotional changes (12) modified for the Indonesian context of primary healthcare services for adolescents (Table 2). Secondary sexual development data were collected by PDS (29) using participants' self-report of their development on five markers of pubertal growth. Both sexes were asked about their growth spurt, body hair growth, and skin changes. In addition, boys were asked about changes to voice, growth of facial hair, and nocturnal emissions and girls were asked about breast development and menarche.

We have got approval to develop a PDS questionnaire (29) with letter seeking permission to use survey/questionnaire tool by email. We developed PDS following these steps. First, from a panel of experts with a professor in pediatric nursing and laboratorium members, we analyzed the PDS original version and then developed six questions for the self-administered questionnaire for adolescents. Second, we developed PDS regarding Indonesian adolescent context. The sixth question of PDS in the English version has been translated into Indonesian language and then we used the back translation method with two doctoral students in pediatric nursing from Indonesia who understand Indonesian language natively.

We modified the original PDS in the Indonesian context because the educational background of Indonesians has a large variation from not attending school (cannot read) to postgraduation, and pubertal development in Indonesia is a very sensitive topic of discussion, especially in the Islamic context to talk about sexuality and RH. Therefore, in this study, we modified it based on the information about pubertal development which adolescents get from their biology class in their junior high school.

We modified PDS for the purposes of this study. There were six secondary development characteristics for boys: nocturnal emissions; increase in muscle mass; Adam's apple development; hair growth in the armpit, face, and genitalia; oily armpits; and a deepened voice. The six signs for girls were as follows: menstruation; growth of breasts; nipple changes; widened hips; hair growth in the genitalia and armpit; and oily skin. Responses were either "Yes" or "No" (no = 0, yes = 1). The six signs were summed to create a composite score for secondary sexual development, with higher scores indicating more mature secondary sexual development (categorized in two groups by median score: immature vs. mature).

Emotional changes were measured using four items for psychological and emotional changes in adolescence (12). Both sexes were asked the same four yes/no questions covering the following

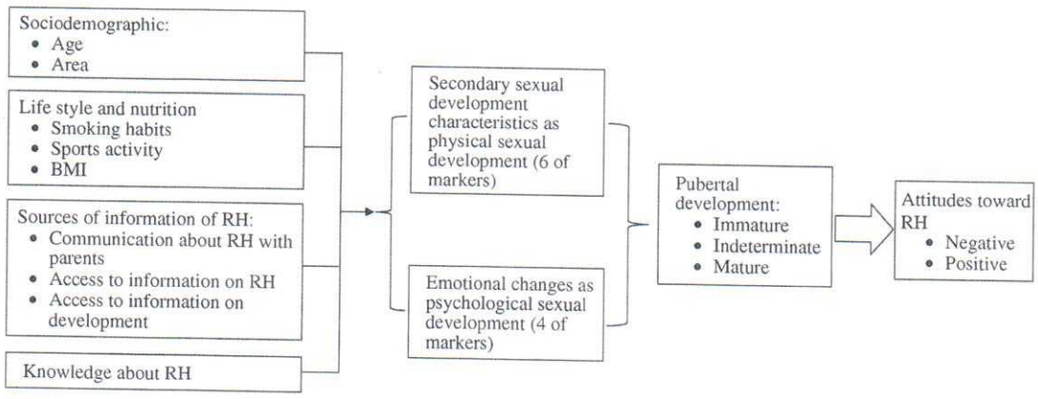

Figure 1: Conceptual scheme of pubertal development and attitudes toward adolescent reproductive health.

Table 1: Characteristics of participants (n = 1040).

Variables	Total	Girls	Boys
	n (%)	n (%)	n (%)
Age (year)			
12	103 (9.9)	54 (9.4)	49 (10.6)
13	304 (29.2)	180 (31.2)	124 (26.8)
14	422 (40.6)	228 (39.5)	194 (41.9)
15	203 (19.5)	111 (19.2)	92 (19.9)
16	8 (0.8)	4 (0.7)	4 (0.9)
Area			
Rural	708 (68.1)	397 (68.8)	311 (67.2)
Urban	332 (31.9)	180 (31.2)	152 (32.8)
Smoking			
No	965 (92.8)	568 (98.4)	397 (85.7)
Yes	75 (7.2)	9 (1.6)	66 (14.3)
Sports activity			
No	236 (22.7)	175 (30.3)	61 (13.2)
Yes	804 (77.3)	402 (69.7)	402 (86.8)
Communication about RH to parents			
Often	176 (16.9)	129 (22.4)	47 (10.2)
Occasionally	539 (51.8)	332 (57.5)	207 (44.7)
Never	325 (31.3)	116 (20.1)	209 (45.1)
Access to information on RH			
Access	220 (21.2)	90 (15.6)	130 (28.1)
Not access	820 (78.8)	487 (84.4)	333 (71.9)
Access to information on development			
Access	213 (20.5)	95 (16.5)	118 (25.5)
Not access	827 (79.5)	482 (83.5)	345 (74.5)
Knowledge about RH			
Low	287 (27.6)	162 (28.1)	125 (27.0)
Middle	452 (43.5)	260 (45.1)	192 (41.5)
High	301 (28.9)	155 (26.9)	146 (31.5)
BMI	18.3 (16.4–20.3)	18.5 (16.6–20.3)	17.8 (16.0–20.3)

RH, Reproductive health; BMI, body mass index. Md (P_{25}–P_{75}).

immature pubertal development (95% CI: 14.9%–25.7%). Among girls, 43.7% were categorized as having immature secondary sexual development and 25.6% showed immature emotional changes. Therefore, 18.4% of girls had immature pubertal development (95% CI: 11%–25.7%). Among boys, 35.9% were classified as having immature secondary sexual development and 35.6% immature emotional changes. Therefore, 22.7% of boys had immature pubertal development (95% CI: 14.7%–30.7%). Overall, 39% of participants had negative attitudes toward RH (95% CI: 34.3%–43.8%), but this was higher in girls (40.6%, 95% CI: 34.3%–46.8%) than boys (37.1%, 95% CI: 29.9%–44.7%).

Factors associated with negative attitudes toward RH among girls

We evaluated candidate factors related to attitudes toward RH with a cut-off point of $p < 0.05$ into multivariate analysis (Table 3). The logistic regression analysis (Table 4) showed that the factors associated with negative attitudes toward RH among girls were as follows: age (11–13 years), odds ratio (OR): 1.52 (95% CI: 1.05%–2.21%); area (urban), OR: 2.04 (95% CI: 1.34%–3.10%); communication about RH to parents (occasionally), OR: 1.74 (95% CI: 1.08%–2.79%); knowledge about RH (high), OR: 0.24 (95% CI: 0.14%–0.41%); and immature (OR: 2.27, 95% CI: 1.34%–2.84%) or indeterminate (OR: 4.11, 95% CI: 2.47%–6.83%) pubertal development.

Factors associated with negative attitudes toward RH among boys

This analysis also used a cut-off point of $p < 0.05$ that used to select candidate of factors into multivariate analysis (Table 3). The logistic regression analysis (Table 4) showed that the factors associated with negative attitudes toward RH among boys were as follows: age (11–13 years), OR: 1.56 (95% CI: 1.01–2.40); smoking (yes), OR: 2.35 (95% CI: 1.21%–4.58%); communication about RH to parents (never), OR: 2.80 (95% CI: 1.29%–6.10%); knowledge about RH (high), OR: 0.23 (95% CI: 0.13%–0.41%); and indeterminate pubertal development, OR: 2.49 (95% CI: 1.47%–4.24%).

Discussion

Presence of immature pubertal development

The present study found that 20.3% of adolescents had immature pubertal development. This result was higher compared with late stage-normative pubertal development in three North Carolina counties (13%) (34). The differences in the results may reflect the wide variation in the age of onset and timing of puberty by sex and race/ethnicity, as well as individual, socioeconomic, and health status differences. More boys (22.7%) were immature than girls (18.4%), which is consistent with a previous study that found that girls had an earlier onset of puberty than boys (23). However, studies in Thailand (23), Iran (35), and the UK (36) have confirmed that the mean age of puberty has declined. We found a higher presence of immature pubertal development. This suggests that Indonesia needs to develop an instrument to assess the timing of the onset of puberty and secondary sexual and emotional characteristics that considers sex and race/ethnicity.

Table 3: Sociodemographics, lifestyle, communication and information, knowledge about RH, and pubertal development by attitudes toward RH (n = 1040).

Attitudes toward RH	Girls				Boys			
	n (%)	Negative	Positive	χ^2/Z (p)	n (%)	Negative	Positive	χ^2/Z (p)
		n (%)	n (%)			n (%)	n (%)	
Age								
11–13 years	234 (40.6)	113 (48.3)	121 (35.3)	9.239 (0.002)	173 (37.4)	75 (43.6)	98 (33.7)	4.138 (0.042)
14–16 years	343 (59.4)	121 (51.7)	222 (64.7)		290 (62.6)	97 (56.4)	193 (66.3)	
Area								
Rural	397 (68.8)	177 (75.6)	220 (64.1)	8.045 (0.005)	311 (67.2)	118 (68.6)	193 (66.3)	0.162 (0.687)
Urban	180 (31.2)	57 (24.4)	123 (35.9)		152 (32.8)	54 (31.4)	98 (33.7)	
Smoking habits								
No	568 (98.4)	230 (98.3)	338 (98.5)	0.000 (1.000)	397 (85.7)	157 (91.3)	240 (82.5)	6.155 (0.013)
Yes	9 (1.6)	4 (1.7)	5 (1.5)		66 (14.3)	15 (8.7)	51 (17.5)	
Sports activity								
No	175 (30.3)	75 (32.1)	100 (29.2)	0.424 (0.515)	61 (13.2)	22 (12.8)	39 (13.4)	0.002 (0.964)
Yes	402 (69.7)	159 (67.9)	243 (70.8)		402 (86.8)	150 (87.2)	252 (86.6)	
Communication about RH to parents								
Often	129 (22.4)	59 (25.2)	70 (20.4)	13.725 (0.001)	47 (10.2)	12 (7.0)	35 (12.0)	10.658 (0.005)
Occasionally	332 (57.5)	114 (48.7)	218 (63.6)		207 (44.7)	66 (38.4)	141 (48.5)	
Never	116 (20.1)	61 (26.1)	55 (16.0)		209 (45.1)	94 (54.7)	115 (39.5)	
Access to information on RH								
Access	90 (15.6)	37 (15.8)	53 (15.5)	0.000 (1.000)	130 (28.1)	48 (27.9)	82 (28.2)	0.000 (1.000)
Not access	487 (84.4)	197 (84.2)	290 (84.5)		333 (71.9)	124 (72.1)	209 (71.8)	
Access to information on development								
Access	95 (16.5)	48 (20.5)	47 (13.7)	4.209 (0.040)	118 (25.5)	172 (25.0)	291 (25.8)	0.005 (0.941)
Not access	482 (83.5)	186 (79.5)	296 (86.3)		345 (74.5)	91 (75.0)	122 (74.2)	
Knowledge about RH								
Low	162 (28.1)	95 (40.6)	67 (19.5)	33.963 (<0.001)	125 (27.0)	77 (44.8)	48 (16.5)	43.159 (<0.001)
Middle	260 (45.1)	96 (41.0)	164 (47.8)		192 (41.5)	56 (32.6)	136 (46.7)	
High	155 (26.9)	43 (18.4)	112 (32.7)		146 (31.5)	39 (22.7)	107 (36.8)	
Pubertal development								
Immature	106 (18.4)	70 (29.9)	36 (10.5)	49.276 (<0.001)	211 (20.3)	130 (34.9)	81 (15.5)	32.443 (<0.001)
Indeterminate	188 (32.6)	85 (36.3)	103 (30.0)		309 (29.7)	136 (29.7)	173 (24.1)	
Mature	283 (49.0)	79 (33.8)	204 (59.5)		520 (50.0)	140 (35.5)	380 (60.5)	
BMI	577	18.4 (16.2–20.5)	18.5 (16.6–20.3)	−0.412 (0.681)	463	17.5 (15.9–19.8)	18.3 (16.3–20.3)	−1.985 (0.047)

RH, Reproductive health; BMI, body mass index; Md ($P_{25} - P_{75}$). p-Values determined by Chi-square, χ^2, or Fisher's Fisher's exact test for categorical data and Mann-Whitney U-test, Z, for numerical data.

Presence of negative attitudes toward RH

We found that 39% of adolescents had negative attitudes toward RH during pubertal development. These findings were higher compared with risk behaviors regarding no signs of pubertal development in the US (23.4%) (10). The differences in these findings might be explained by the lack of early detection of puberty and support from adolescent health services in Indonesia, which might have resulted in negative attitudes in early puberty. This might be exacerbated by the complex physical, psychological, and emotional changes that occur during puberty and might impact on behavior patterns. We found that girls had more negative attitudes toward RH than boys (40.6% vs. 37.1%). This is consistent with previous studies that found that puberty timing and phases effected negative attitudes (37) and emotion recognition (38) in females. Our findings suggest that provision of primary health services for adolescents is important in detecting and facilitating adolescents' health and preventing negative attitudes that may appear during puberty.

Factors associated with negative attitudes toward RH among girls

There were five factors associated with negative attitudes in girls during puberty: age (younger), area (urban),

that early puberty (39), parent-adolescents' communication (20), and pubertal development (18) were related to attitudes toward RH. The explanation for these findings might be similar to that for girls. Therefore, development of strategic adolescent programs is necessary to encourage health and positive attitudes toward RH during puberty in Indonesia, such as health-promotion programs for adolescents or youth-friendly school or community initiatives.

Our finding that smoking habit is associated with negative attitudes toward RH among boys is consistent with those of previous studies that found that pubertal timing was related to cigarette use and social competence (51). Pubertal timing may also represent a high risk for substance abuse (52, 53). These findings might be explained by the fact that adolescents are drawn to new and challenging risky experiences, including smoking, and are influenced by peer pressure and the environment during puberty. Adolescents are in a transition period; they are looking for self-identity and developing new expectations of their social life. Our results suggest a need to monitor the development of adolescents during puberty to prevent negative or health-risk behaviors, such as the use of cigarettes. The Indonesian government regulated the trading and advertising of cigarettes to limit age of cigarette consumption.

Our finding that boys never communicating about RH to their parents and indeterminate pubertal development in boys is associated with negative attitudes toward RH is similar to those of a previous study in Vietnam (20) that found low parent-adolescent communication about RH. Early or late age of onset of puberty was found to be related to adolescents' attitude (18) and risk-taking behavior (39). Our finding that high knowledge about RH reduced negative attitudes in boys is consistent with those of previous studies in Indonesia (49) and Iran (50). The explanation for this might be similar to that for girls previously discussed.

Findings from this study have implications for prevention programs during puberty. First, both girls and boys who were younger and never/occasionally communicated about RH to their parents may need more attention during puberty to prevent negative attitudes toward RH. Programs that increase knowledge about RH may also be useful in preventing negative attitudes during puberty, particularly for girls in urban areas and boys with a smoking habit. Further investigation into assessment tools for pubertal development for both secondary sexual characteristics and emotional changes, especially those that categorize adolescents as mature, indeterminate, and immature, is needed to help detect and prevent negative attitudes toward RH during puberty. Such assessment tools should be easy to use for parents, teachers, and primary healthcare services.

A limitation of this study was the cross-sectional design that allowed interpretation of associations between study variables, rather than causal conclusions. Another limitation was that the immature pubertal development and negative attitudes toward RH measured present in this study may differ from those of other studies because of the sample size and new definitions of puberty and attitudes. The strength of this study was that it is a current Indonesian study that used self-report for pubertal development, including secondary sexual characteristics and emotional changes. We were able to categorize participants into three groups based on pubertal development (mature, indeterminate, and immature) and identify factors associated with negative attitudes toward RH. The assessment tools were easy to use and allowed early detection of pubertal development. These tools could be used by adolescents themselves, parents, teachers, or primary healthcare services, although an investigation is needed to further develop these tools.

Conclusion

In summary, the present study demonstrated that younger age, communication about RH to parents (never/occasionally), and pubertal development (indeterminate/immature) were associated with negative attitudes toward RH in boys and girls. Living in an uban area was an additional factor for girls and a smoking habit was an additional factor for boys. Higher knowledge about RH reduced negative attitudes toward RH among both boys and girls. Our results suggest that RH-promotion programs designed to improve knowledge about RH may help to detect early or late puberty and facilitate communication between parents and children. Specific areas of focus could be addressing the information needs of girls in urban areas and boys with a smoking habit to help reduce negative attitudes to RH during puberty.

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