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Original Article

Reproductive health knowledge and behavioural responses to physical changes in adolescents

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Abstract

Background: Adolescence is a critical developmental period marked by rapid physical changes that require adequate understanding and appropriate behavioural responses. Limited knowledge of reproductive health during early adolescence may hinder adolescents' ability to respond positively to these changes, potentially leading to maladaptive behaviours and negative health outcomes. Despite its importance, reproductive health knowledge among early adolescents remains insufficient in many settings.

Aims: This study aimed to examine the association between reproductive health knowledge and behavioural responses to physical changes among adolescents.

Methods: An analytical cross-sectional study was conducted among early adolescents aged 10–12 years. A total of 87 participants were recruited using a total sampling technique. Data were collected using a validated self-administered questionnaire assessing reproductive health knowledge and behavioural responses to physical changes. Data were analysed using descriptive statistics and Spearman's rank correlation test.

Results: The findings indicated that a substantial proportion of adolescents had low levels of reproductive health knowledge, although most participants demonstrated positive behavioural responses to physical changes. Statistical analysis revealed a significant positive association between reproductive health knowledge and behavioural responses ($p < 0.05$), indicating that higher levels of knowledge were associated with more positive behaviours.

Conclusion: Reproductive health knowledge is significantly associated with adolescents' behavioural responses to physical changes. Strengthening reproductive health education during early adolescence is essential to support positive behavioural adaptation and promote healthy developmental outcomes.

Keywords: behavioural responses; physical changes; reproductive health; knowledge

1. Introduction

Adolescence represents a critical transitional stage in the human life course, characterised by rapid and complex changes in physical, psychological, and social development. One of the most prominent features of this period is the onset of puberty, during which significant physical changes occur because of hormonal maturation and biological growth processes (BKKBN, 2022). These changes include the development of primary and secondary sexual characteristics, alterations in body proportions, and accelerated growth spurts, all of which require appropriate understanding and adaptive behavioural responses from adolescents (Kemenkes RI, 2024).

Early adolescence, particularly between the ages of 10 and 12 years, marks the initial phase of pubertal development and is often accompanied by confusion, anxiety, or uncertainty when physical changes are not adequately understood (WHO, 2023). During this stage, adolescents begin to experience bodily transformations such as menarche in females and nocturnal emissions in males, which are natural biological processes but may be perceived as distressing in the absence of sufficient reproductive health knowledge (Kustin, 2023b).Inadequate understanding of these changes may negatively affect adolescents' self-perception, emotional wellbeing, and behavioural responses.

Reproductive health knowledge plays a fundamental role in shaping adolescents' attitudes and behaviours in responding to physical changes. Knowledge functions as an internal determinant that influences how individuals perceive bodily changes, make decisions, and engage in health-related behaviours (Notoatmodjo, 2021). Adolescents with adequate reproductive health knowledge are more likely to demonstrate positive behavioural responses, such as maintaining personal hygiene, adopting healthy coping strategies, and seeking appropriate information or support (Kustin & Handayani, 2025).Conversely, limited or inaccurate knowledge may lead to maladaptive behaviours, including social withdrawal, negative body image, and inappropriate responses to developmental changes (Tort-Nasarre et al., 2021).

In Indonesia, reproductive health knowledge among early adolescents remains a significant public health concern. National and regional reports indicate that a considerable proportion of adolescents lack basic understanding of pubertal changes and appropriate self-care practices during adolescence (BKKBN, 2022). This issue is particularly evident in semi-urban and rural areas, where access to structured reproductive health education and reliable information sources may be limited. As a result, adolescents often rely on peers or digital media for information, which may not always provide accurate or age-appropriate guidance (Saha et al., 2022).

Previous studies have consistently demonstrated an association between reproductive health knowledge and adolescent behaviour (Kristianti & Widjayanti, 2021a). Higher levels of knowledge have been linked to healthier behavioural patterns and more adaptive responses to physical and psychosocial changes, whereas lower levels of knowledge are associated with increased vulnerability to negative or risky behaviours (Nasution et al., 2022).Knowledge, however, does not operate in isolation; behavioural responses are also influenced by family environment, school support, cultural norms, and access to credible information sources (Notoatmodjo, 2022).

Despite the growing body of literature on adolescent reproductive health, empirical evidence focusing specifically on early adolescents' behavioural responses to physical changes remains limited (Sawalma et al., 2023). Understanding this relationship is particularly important, as early adolescence constitutes a foundational period during which attitudes and behaviours toward bodily changes are formed and may persist into later stages of development (Kustin, 2023a). Examining the association between reproductive health knowledge and behavioural responses during this stage may provide valuable insights for the development of targeted educational interventions and school-based health promotion programmes.

Therefore, this study aimed to examine the association between reproductive health knowledge and behavioural responses to physical changes among adolescents. By focusing on early adolescents, this study seeks to contribute to the evidence base supporting reproductive health education as a key strategy for promoting positive behavioural adaptation and healthy adolescent development.

2. Materials and Methods

2.1 Study Design

This study employed an analytical cross-sectional design to examine the association between reproductive health knowledge and adolescents' behavioural responses to physical changes (Notoadmojo, 2019; 2020). The cross-sectional design was appropriate because the study assessed the two variables concurrently within the study population.

2.2 Study Setting

The study was conducted in June 2025 at a public primary school in East Java, Indonesia.

2.3 Participants and Sampling

The study population comprised all female students enrolled in Grades IV and V who met the eligibility criteria. A total sampling technique was applied, resulting in 87 participants included in the study.

The inclusion criteria were female students aged 10–12 years who were willing to participate and had experienced physical changes associated with early adolescence. Students who were absent during the data collection period were excluded from the study.

2.4 Data Collection

Data were collected using a structured, self-administered questionnaire adapted from previously validated studies. The questionnaire consisted of two sections assessing reproductive health knowledge and behavioural responses to physical changes. Prior to data collection, the instrument was tested for validity and reliability to assess its suitability for the study population.

2.5 Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS). The version of SPSS used should be specified in the final manuscript. Descriptive statistics were used to summarise participants' characteristics, reproductive health knowledge, and behavioural responses to physical changes. Spearman's rank correlation test was used for bivariate analysis to examine the association between reproductive health knowledge and behavioural responses because the variables were measured on an ordinal scale. Statistical significance was set at $p < 0.05$.

2.6 Ethical Considerations

Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas dr. Soebandi Jember (Reference No. 1195/KEPK/UDS/VI/2025). Written informed consent was obtained from all participants and their legal guardians prior to data collection. Confidentiality and anonymity of the participants were maintained throughout the study.

3. Results

3.1 Participant characteristics

A total of 87 early adolescents participated in this study. Slightly more than half of the participants were enrolled in Grade 5 (51.7%). Teachers were identified as the primary source of reproductive health information by most respondents (60.9%). With regard to parental occupation, the largest proportion of parents were self-employed (43.7%) (Tabel 1).

Table 1. Participant characteristics (n = 87)

Characteristic	n	%
Grade		
Grade 4	42	48.3
Grade 5	45	51.7
Primary source of reproductive health information		
Teachers	53	60.9
Peers	12	13.8
Parents	6	6.9
Electronic media	14	16.1
Partner	2	2.3
Parents' occupation		
Farmer	26	29.8
Labourer	15	17.3
Civil servant	8	9.2
Self-employed	38	43.7

3.2 Reproductive health knowledge and behavioural responses

The distribution of reproductive health knowledge indicated that 37.9% of participants had poor knowledge, followed by good (36.8%) and fair knowledge levels (25.3%). In contrast, most adolescents demonstrated positive behavioural responses to physical changes (94.3%) (Tabel 2).

Table 2. Distribution of reproductive health knowledge and behavioural responses (n = 87)

Variable (category)	n	%
Reproductive health knowledge		
Good	32	36.8
Fair	22	25.3
Poor	33	37.9
Behavioural responses		
Positive	82	94.3
Negative	5	5.7

3.3 Association between reproductive health knowledge and behavioural responses

Cross-tabulation analysis showed that all adolescents with good and fair reproductive health knowledge demonstrated positive behavioural responses. Negative behavioural responses were observed only among adolescents with poor knowledge levels. Spearman's rank correlation analysis demonstrated a statistically significant association between reproductive health knowledge and behavioural responses ($\rho = 0.283$; $p = 0.0008$) (Tabel 3).

Table 3. Association Between Reproductive Health Knowledge and Behavioural Responses (n = 87)

Knowledge level	Positive behaviour n (%)	Negative behaviour n (%)	Total n (%)
Good	32 (36.8)	0 (0.0)	32 (36.8)
Fair	22 (25.3)	0 (0.0)	22 (25.3)
Poor	28 (32.2)	5 (5.7)	33 (37.9)
Total	82 (94.3)	5 (5.7)	87 (100.0)

Spearman's rank correlation coefficient (ρ) = 0.283; p = 0.0008.

4. Discussion

This study examined the association between reproductive health knowledge and adolescents' behavioural responses to physical changes during early adolescence. The findings demonstrate a statistically significant positive association between knowledge and behaviour, indicating that adolescents with higher levels of reproductive health knowledge tend to respond more positively to physical changes. This result supports the premise that knowledge plays a critical role in shaping health-related behaviours during developmental transitions.

The observed association aligns with behavioural health theories that conceptualise knowledge as a foundational determinant of behaviour formation. Knowledge influences attitudes and perceptions, which subsequently guide individual responses to health-related stimuli (Salam et al., 2016). In the context of early adolescence, adequate understanding of pubertal changes enables adolescents to interpret physical transformations as normal developmental processes rather than sources of anxiety or embarrassment (Santrock JW., 2019). This understanding may foster adaptive coping strategies and positive behavioural responses, such as appropriate self-care and emotional regulation (Juniva Namlaun Nikmah & Kustin, 2025).

Although most participants in this study demonstrated positive behavioural responses, a considerable proportion exhibited low levels of reproductive health knowledge. This finding suggests that positive behaviour may not solely depend on individual knowledge but may also be influenced by external factors, such as parental guidance, school support, and social environment (Rahmawati et al., 2023). Similar observations have been reported in previous studies, which highlight the role of family and educational institutions in shaping adolescent behaviour, even when individual knowledge levels remain limited (Maulana & Kustin, 2025). Schools play a pivotal role as trusted sources of information, as reflected by the high proportion of adolescents who identified teachers as their primary source of reproductive health knowledge in this study (Nasution et al., 2022).

The finding that negative behavioural responses were observed exclusively among adolescents with poor knowledge levels underscores the potential vulnerability associated with insufficient reproductive health education. Adolescents with limited understanding of physical changes may experience confusion, misinterpretation of bodily signals, and heightened emotional distress, which can manifest as maladaptive behaviours (Nuryasita et al., 2022). Previous research has similarly reported that inadequate reproductive health knowledge is associated with negative attitudes, poor self-care practices, and increased psychosocial risks during adolescence (Kristianti & Widjayanti, 2021).

The magnitude of the correlation observed in this study was modest, suggesting that while reproductive health knowledge is an important factor, it is not the sole determinant of adolescents' behavioural responses (Mareti & Nurasa, 2022). Behaviour during adolescence is multifactorial and shaped by a complex interplay of cognitive, emotional, social, and cultural influences (Kustin & Handayani, 2024b). Parental attitudes, peer norms, media exposure, and socio-cultural values may either reinforce or undermine the effects of formal health education (Notoatmodjo, 2021).These findings highlight the need for comprehensive and context-sensitive approaches to adolescent reproductive health education that extend beyond information provision alone (Agustin et al., 2026).

From a nursing and health sciences perspective, the results of this study underscore the importance of early, age-appropriate reproductive health education as a preventive strategy (Herlianty et al., 2025; Tort-Nasarre et al., 2021). Early adolescence represents a critical window for intervention, during which foundational knowledge and attitudes toward bodily changes are established and may persist into later adolescence and adulthood (Zalewska et al., 2024). Integrating reproductive health education into school-based health programmes, supported by nurses, teachers, and parents, may enhance adolescents' capacity to respond positively to physical changes and promote healthier developmental trajectories (Kustin & Handayani, 2024).

This study contributes to the existing literature by focusing specifically on early adolescents and their behavioural responses to physical changes, an area that remains underexplored in comparison to studies involving older adolescents (Solehati et al., 2023). By highlighting the association between knowledge and behaviour during this formative stage, the findings provide empirical support for strengthening reproductive health education initiatives at the primary school level(Fardiansyah et al., 2025) . Future research may benefit from longitudinal designs to explore causal pathways and from qualitative approaches to gain deeper insights into adolescents lived experiences and contextual influences.

5. Conclusion

This study demonstrates a significant association between reproductive health knowledge and adolescents' behavioural responses to physical changes during early adolescence. Adolescents with higher levels of knowledge were more likely to exhibit positive behavioural responses, whereas negative behaviours were observed only among those with limited knowledge. These findings highlight the importance of reproductive health knowledge as a key factor in supporting adolescents' adaptive responses to developmental changes.

The results underscore the need for early, structured, and age-appropriate reproductive health education within school and community settings. Strengthening educational interventions during early adolescence may enhance adolescents' capacity to understand and respond positively to physical changes, thereby contributing to healthier developmental outcomes and improved adolescent wellbeing.

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Competing interests

All authors declare that there are no conflicts of interest related to this study.

Underlying data

Derived data supporting the findings of this study are available from the corresponding author on reasonable request.

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