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DESCRIPTION OF THE IMPACT OF ANXIETY IN ADOLESCENTS AGED 10-13 ON THE RISK OF PUBERTY DISORDERS AT SDN 4 CIKUNIR ELEMENTARY SCHOOL, TASIKMALAYA DISTRICT

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Abstract

Early adolescence (aged 10-12 years) is the growth phase of puberty. During this time, the body undergoes significant adaptations, mainly guided by neuroendocrine factors that are crucial for reaching sexual maturity. Pubertal symptoms can often trigger anxiety, and become a stressor that complicates adjustment to physical and hormonal changes. This study aims to analyse the impact of anxiety in early adolescents on the risk of experiencing disorders during puberty. The observational research employed a descriptive analysis approach involving 40 adolescents aged 10 to 13. The total sampling method was used, with data collection instruments including height measuring tools, weight scales, questionnaires, and checklists. The results from anxiety measurement, using the Revised Children's Manifest Anxiety Scale (RCMAS), indicated that 95% of male participants and 90% of female participants reported experiencing anxiety related to puberty. 15% of adolescent girls over nine years old and twenty-five percent of boys under nine years old experience precocious or early puberty. Among respondents, 7 (63.6%) were male, and 4 (36.4%) were female adolescents with a thin BMI. Regarding symptoms of precocious puberty, 60% were suspected to have central precocious puberty, while 40% were suspected to have peripheral precocious puberty. In conclusion, adolescents' lack of confidence and embarrassment due to taboos. There is a need for health counsellors to increase adolescents' knowledge.

Keywords; *Anxiety, BMI, Early Puberty, Adolescents*

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1. Introduction

Adolescence is a transitional period marked by significant physical, emotional, and psychological changes. One distinctive trait of adolescents is their tendency to imitate behaviors observed in their surroundings, including their social environment and peers. Additionally, adolescents have a distinct need for sexual health, which varies greatly among individuals [1,2].

Puberty represents the transitional phase between childhood and adulthood, occurring in several stages and influenced by a complex interplay of neuroendocrine factors. These factors are responsible for the onset and development towards complete sexual maturity [2,3]. Although the age of onset for

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puberty can vary widely, most girls begin this transition between the ages of 8 and 13, while boys typically begin between the ages of 9 and 14 [3,4,5,6].

Multiple factors can influence the onset of puberty, including ethnic background, social circumstances, psychological state, nutrition, physical health, and chronic illnesses [4,7,8]. Puberty is considered abnormal if its onset is excessively early or delayed. Precocious puberty is identified when secondary sexual characteristics appear before the age of 8 in girls or before the age of 9 in boys [5,7,9,10].

Anxiety during puberty is linked to the myriad changes occurring during this developmental stage. Various factors contribute to adolescent anxiety, including individual circumstances, educational backgrounds, previous negative experiences, gender, self-acceptance, and social support from parents and peers. The impact of anxiety in adolescents navigating puberty can often lead to traumatic experiences, especially when accompanied by physical symptoms such as vomiting and body spasms [1].

The government's initiative to eliminate new cases of stunting by 2024 necessitates the establishment of conditions conducive to healthy adolescents. According to information obtained from the village midwife in Cikunir, as of December 2023, there are 558 male adolescents and 591 female adolescents in the area. Cikunir has health facilities in place to monitor adolescent health conditions through two youth health posts (Posyandu Remaja) located in Pameungpeuk and Gunung Kawung. Each health post is staffed with trained youth cadre members to facilitate adolescent health monitoring.

This research aims to assess both the physical and psychological conditions of adolescents in the early stages of puberty, providing insights into the potential tendencies towards sexual maturation as well as any associated disruptions.

The primary objective of this study is to describe the relationship between puberty, anxiety, early puberty, and the potential risks of puberty disorders in adolescents aged 10 to 13 years.

2. Method

This study employs a quantitative approach with a descriptive method to illustrate the conditions of puberty in relation to anxiety, early puberty, and potential risks associated with puberty disorders for early adolescents aged 10 to 13 years. A total sampling technique was utilized, meaning that the entire population of interest was included as part of the sample. The research was conducted at SDN 4 Cikunir, focusing on male and female adolescents who have entered puberty within the specified age range, as part of the youth health post's target area. The study is scheduled for March 2024.

Data collection instruments include a research questionnaire and a form for recording body weight and height to assess the nutritional status of the respondents. Additionally, the measurement of anxiety levels among adolescents aged 10 to 13 years will be conducted using the Revised Children's Manifest Anxiety Scale (RCMAS). The analysis will employ univariate statistical methods to interpret the data collected.

3. Results and Discussion

1) Characteristics of Adolescent Respondents

Table 1. Distribution of Respondent Characteristics

Age	Boys	Girls	Total
< 9	5	0	5
9-10	15	11	26
11-12	0	9	9
Total	**20**	**20**	**40**

Data sources: Primer, 2024

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2). Puberty Anxiety

a). Anxiety About Puberty Symptoms

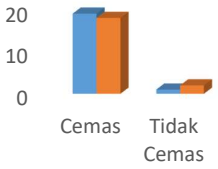


Diagram 1. Anxiety of Adolescent Based on Sex during Puberty

b). Puberty Symptoms in Respondents Without Anxiety

Table 2. Puberty Symptoms in Respondents Without Anxiety

No	Sex	BMI	Age	Symptoms
1	M	17,9 (N)	9-10	Wet dream
2	F	18,6 (N)	10	Emotional
3	F	18,5 (N)	11-12	Vaginal discharge, Emotional

Data sources: Primer, 2024

c) Anxiety in Underweight Adolescents

Diagram 2. Frequency Distribution of Anxiety by BMI in Adolescents (10-12 years)

Table 3 Respondents with anxiety and BMI category Thin

Sex	BMI	Age	Puberty Symptoms
M (I)	14,05	9-10	Voice changes., increased height. and Muscle Growth.
M (J)	14,06	9-10	Wet dreams
M (K)	15,03	9-10	Wet dreams, increased height, muscle growth, increase in size of the penis and testes
F (N)	16,4	12	Menstruation, acne and vaginal discharge
F (V)	15,8	10	Enlarged breasts and widened pelvis, vaginal discharge
F (Y)	15,5	11	Enlarged breasts and widened pelvis, vaginal discharge
F (AE)	15,8	9-10	Wet dreams, voice changes, Growth of the Adam's apple
M (AF)	16	<9	pubic and axillary hair growth
M(AH)	15,5	9-10	Growth of the Adam's apple
M(AI)	16	9-10	Wet dreams, body changes, Growth of the Adam's apple
F(AM)	14,9	9	Breast growth, Widening of the pelvis and acne

Data sources: Primer, 2024

3). Initial Puberty Symptoms

Table 4. Distribution of Initial Puberty Symptoms Among Respondents

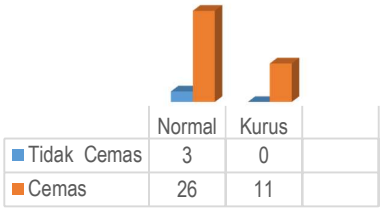
Res	BMI	Early Puberty Symptoms
A	17 (A)	Growth of the Adam's apple, pubic and axillary hair growth
C	17 (A)	Wet dreams, Voice Changes, Growth of the Adam's apple and Acne
E	19,1 (A)	Wet dreams, increased height, Muscle growth
F	26,7 (A)	voice changes, increased height, muscle growth, and acne
AF	16 (T)	pubic and axillary hair growth

Notes A=Average; T=Thin

Data sources: Primer, 2024

4). Types of Puberty Disorder Risks

Table 5: Types of Risks for Central and Peripheral Precocious Puberty in Male Adolescents



Age	Height	BMI	Tanner Stage	Initial Puberty Symptoms	Tanner Stage	Risk of Puberty
13	149,4 P	17 N	<9	Adam's apple development, pubic and axillary hair	2	Followed by complete other puberty symptoms **(suspicion of central precocious puberty)**
11	152,3 N	17 N	<9	Wet dreams, voice changes, Adam's apple development, acne	3	Followed by complete other puberty symptoms **(suspicion of central precocious puberty)**
12	150 N	19,1 N	<9	Wet dreams, increased height and muscle mass	3	Not followed by complete other puberty symptoms (incomplete) **(suspicion of central precocious puberty)**
12	151,1 N	26,7 N	<9	Voice changes, increased height and muscle growth, acne	3	Not followed by complete other puberty symptoms (incomplete) **(suspicion of peripheral precocious puberty)**

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11	148 N	16 K	<9	Hair development in pubic and axillary areas	2	Not followed by other puberty symptoms (incomplete) **(suspicion of peripheral precocious puberty)**

Sumber data: data primer, 2024

Anxiety

The measurement of anxiety is based on the results of anxiety assessment using the RCMAS instrument. According to Diagram 1, it is evident that male respondents experience anxiety symptoms at a rate 95% higher than females, with the latter at 90%. This aligns with Kaplowitz's assertion that anxiety is one of several issues arising from the physical and psychological changes experienced by adolescents as a form of coping with stress due to these transformations [11,12].

Differences in prevalence based on gender emerge following the onset of puberty, a sensitive period [13,14]. According to Stuart, there are three levels of anxiety: **Mild anxiety** is associated with everyday life tensions that cause individuals to be alert and enhance their perceptual field. **Moderate anxiety** allows individuals to concentrate on important matters while dismissing others, consequently narrowing their perceptual field. **Severe anxiety** significantly restricts an individual's perceptual field, leading them to focus intensely on specific details while neglecting other thoughts. Lastly, Extreme anxiety, the highest level, is characterized by astonishment, fear, and terror [15].

Puberty Disorder

Pubertal development is considered abnormal when puberty occurs either too early or too late. Precocious puberty is defined as the development of secondary sexual characteristics occurring before the age of 8 in girls or before the age of 9 in boys [3,4,6,8,9]. In a study assessing the risk of pubertal disorders, three parameters were utilized: (1) Height-for-age using the CDC growth curve of 2020 (for children aged 2 to 20 years), (2) Age at puberty, and (3) Symptoms of puberty. Data analysis, as presented in Table 5, reveals that only male respondents exhibited symptoms of pubertal disorders, with 11 out of 20 respondents (55%) affected.

Puberty represents a transitional phase between childhood and adulthood, occurring in stages and influenced by complex neuroendocrine factors. These factors are responsible for the onset and progression toward full sexual maturity [2,3]. Although the age of onset varies widely, most children will begin puberty between the ages of 8-13 for girls and 9-14 for boys [3,4,5,6]. Various factors can influence the onset of puberty, including ethnicity, social conditions, psychological factors, nutrition, physical conditions, and chronic illnesses [4,7,16,9].

Puberty development is deemed abnormal when the onset occurs prematurely or belatedly. Precocious puberty is defined as the onset of secondary sexual characteristics before age 8 in girls or before age 9 in boys [4,5,7,9,10]. Generally, pubertal disorders are categorized into two types: (1) Early puberty (precocious), which is subdivided into central precocious puberty (complete) and peripheral precocious puberty (incomplete), characterized by partial signs of pubertal growth, such as premature thelarche, premature pubarche, and gynecomastia; and (2) Delayed puberty, exemplified by constitutional delay of growth and puberty (CDGP).

Based on the research findings from 40 respondents, it was determined that five male respondents (20%) experienced early puberty, commonly referred to as precocious puberty. The clinical manifestations of puberty experienced by the respondents are detailed in Table 2, indicating five clinical manifestations in male respondents, including wet dreams, voice changes, growth of Adam's apple, development of pubic and axillary hair, and increases in height and muscle mass..

Table 3 shows that most respondents experiencing early puberty had a normal BMI. This observation

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aligns with several studies indicating a relationship between growth hormone-binding protein and BMI. Normal development is associated with a high number of growth hormone receptors. A positive correlation exists between BMI and IGF-1 levels, suggesting a connection between factors influencing linear growth and BMI, as well as a positive relationship between BMI and serum insulin levels, which play a significant role in human development through the increased secretion of free IGF-1 [17,18].

Anxiety and the Risk of Pubertal Disorders

The existence of anxiety as a stressor contributing to the risk of pubertal disorders is demonstrated by the findings from the research presented in Table 6, indicating that 13 respondents with anxiety met more than one parameter for pubertal disorders, categorizing them at risk for such disturbances. The stimulus of anxiety related to pubertal disorders is elucidated through a bimolecular approach based on several studies about the presence of the GPRS54 gene, which encodes for G protein-coupled receptors involved in the secretion of Gonadotropin-Releasing Hormone (GnRH) as a genetic determinant in sexual maturation. [19,20,21]. Moreover, according to Table 5, there are 13 respondents who experience anxiety and are at risk for pubertal disorders. The clinical manifestations among the respondents varied, including differences in the age of onset of puberty, symptoms of puberty, and levels of anxiety.

The assessment of the risk of pubertal disorders was conducted through several parameters: (1) Parameter 1 is height. Research findings based on Table 3 indicate that 20% of respondents fall into the short stature category. This aligns with studies showing that early puberty accelerates growth. These children may initially be taller than their peers. However, since bone maturation is also accelerated, growth may be completed at a very young age, resulting in short stature. Short stature is more likely to occur if puberty begins very early (i.e., before age 6) compared to starting relatively early (i.e., between ages 6-8).

Parameter 2, which categorizes the risk of puberty disorders, is the age at which puberty symptoms begin. Most children will start puberty between ages 8-13 for girls and 9-14 for boys. Puberty is considered abnormal when it starts too early or too late. Precocious puberty is defined as the development of secondary sexual characteristics occurring before age 8 in girls or before age 9 in boys [4,5,7,9,10]. Based on Table 4, it was found that there were 5 boys identified as experiencing precocious puberty with an onset age of <9 years.

Parameter 3 that falls under the risk category for puberty disorders is the occurrence of wet dreams at a younger age. This is consistent with Tanner's Theory, which outlines stages of puberty symptoms based on age. (1) **Tanner Stage 1** begins after ages 9-10, characterized by biological processes where the hypothalamus starts releasing gonadotropin-releasing hormone (GnRH) to the pituitary gland, initiating the secretion of FSH and LH. (2) **Tanner Stage 2** begins around age 11 and involves physical changes such as the testicles and skin around the scrotum enlarging, along with fine hair starting to appear around the penis. (3) **Tanner Stage 3** is observed at age 13, with changes including the lengthening of the penis, increase in testicle size, slight breast tissue development in boys, onset of wet dreams, voice changes, muscle growth, and height increase. (4) **Tanner Stage 4** involves nearly complete physical changes in boys, with prominent changes including fine hair developing in the armpits, a permanent deepened voice, onset of acne, and further enlargement of the testicles, penis, and scrotum. [5] **Tanner Stage 5** assesses the physical maturity of children, typically around age 15 for boys.

The research in Table 2 reveals that 60% of respondents (3 individuals) experienced the onset of puberty symptoms, starting with boys, who typically see testicular and penile growth,

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body shape changes, the emergence of an Adam's apple, acne, and the onset of wet dreams,

Rising levels of androgens and estrogens trigger significant early physical changes: in males, this includes penis development and pubic hair growth, while females experience breast enlargement, contributing to overall bodily maturation. Increased FSH levels facilitate spermatogenesis in the testes and follicular development in the ovaries [23,24].

Table 5 highlights "premature menarche" as a risk factor for puberty disorders, with 60% of respondents suspected of having complete central precocious puberty, marked by a gradual emergence of puberty symptoms due to early activation of the hypothalamus-pituitary-gonadal axis. Typically, elevated LH levels stimulate sex steroid production in Leydig cells of the testes or granulosa cells in the ovaries.

The table also notes peripheral precocious puberty, affecting 40% of male respondents. This type is characterized by premature pubic or axillary hair growth (premature pubarche) and premature breast development (premature thelarche) or gynecomastia in males. In pseudo-precocious puberty, elevated testosterone or estrogen in females does not activate the hypothalamic-pituitary-gonadal axis, resulting in low LH and FSH levels and suppressed responses to external GnRH [23,24]. Furthermore, 20% of respondents were identified as short stature, while 80% had normal nutritional status (BMI).

During puberty, five significant changes occur: rapid height increase (growth spurts), the development of secondary sexual characteristics, maturation of reproductive organs, changes in body composition, and alterations in the circulatory and respiratory systems affecting strength and stamina. Weight gain is largely attributed to changes in body composition; males typically see increased muscle mass, while females experience an increase in fat mass, both influenced by sex steroid hormones [25].

4. Conclusion

Puberty is a transitional phase from childhood to adulthood, characterized by the emergence of primary and secondary sexual characteristics as well as the capability for reproduction. This stage is marked by significant hormonal changes, physical transformations, psychological shifts, and psychosocial developments, which can lead to feelings of anxiety and a lack of self-confidence among adolescents.

To address anxiety in adolescents, health promotion initiatives focused on reproductive health are essential, along with the establishment of youth counseling programs that educate peers in schools.

Furthermore, the classification of risks associated with puberty disorders, such as central precocious puberty and peripheral precocious puberty, remains limited to findings gathered from assessments, highlighting the need for thorough examinations to confirm diagnoses. Such assessments may include hormonal evaluations, radiological examinations to assess bone age, and ultrasound investigations to evaluate the conditions of the uterus, fallopian tubes, and ovaries.

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6. References

[1]. La Ode Alifariki, Faktor-Faktor yang Berhubungan dengan Kecemasan Menghadapi Masa Pubertas Remaja di SMPN 20 Kendari Volume 6 Nomor 1 Bulan Oktober 2018 DOI: http://dx.doi.org/10.46496/medula.v6i1.5372

[2]. Rosenfield RL. Puberty in the female and its disorders. Dalam: Sperling MA, 1. penyunting. Pediatric endocrinology. Edisi ke-2. Philadelphia: Saunders; 2002. h 455-518.

[3]. Ducharne JR. Forest MG. Normal pubertal development. Dalam: Bertrand 2. J, Rappaport R, Sizonenkon PC, penyunting. Pediatric endocrinology. Edisi ke-2. Baltimore: Williams; 1993. h 372-86.

[4]. Styne DM. Puberty. Dalam: Greenspan FS. Basic and clinical endocrinology. 3. Edisi ke-3. San Fransisco: Lange; 1992. h 519-40

[5]. Pathomvanich A, Merke DP, Chrousos GP. Early puberty:A cautionary tale. J 4. Pediatr 2000;105: 797-802.

[6]. Cavallo A. Assessment of variation of pubertal development. Dalam Baker RC, 5. penyunting. Pediatric primary care ill- child care. Edisi ke-2. Philadelphia: Lippincott William; 2001. h 163-175.

[7]. Delemarre-Van de Waal HA. Central regulation of human puberty. DeBoer-6. Nieuwkoop: vrije universiteit te Amsterdam, 1984. Disertasi. Kakarla N, Bradshaw KD. Disorders of pubertal development: Precocious 7. Puberty. Semin Reprod Med 2003; 21:339-351 (edisi on line) Diunduh dari: http://www.medscape.com

[8]. Brook CGD. Mechanism of puberty. Horm Res 1999;51(suppl3):52-49.

[9]. Sizonenko PC. Precosius puberty. Dalam: Bertrand J, Rapaport R, Sizonenko 10. PC, penyunting. Pediatric endocrinology. Edisi ke-2. Baltimore: Williams; 1993. h 387-403.

[10]. Roman R, Johnson MC, Codner E, Boric MA, Avila A, Cassoria F. Activating 11. GNAS Gene metation in patient with premature thelarche. J Pediatr 2004;145:1-8.

[11]. Kaplowitz, 2020. *Precocious Puberty*. Medscape Reference

[12]. Agusmanto, Zalukhu. J. R. (2020). Tingkat Kecemasan Terhadap Sikap Anak SD Terhadap Menjaga Kesehatan Di Masa Pandemi Covid-19. Jurnal Skolastik Keperawatan, 6(2), 114–122.

[13]. Harris, E. P., Villalobos-Manriquez, F., Melo, T. G., Clarke, G., & O'Leary, O. F. (2022). Stress during puberty exerts sex-specific effects on depressive-like behavior and monoamine neurotransmitters in adolescence and adulthood. Neurobiology of Stress, 21, 100494. https://doi.org/https://doi.org/10.1016/j.ynstr.2022.100494

[14]. Woo, K. S., Ji, Y., Lee, H. J., & Choi, T. Y. (2021). The association of anxiety severity with health risk behaviors in a large representative sample of korean adolescents. Journal of the Korean Academy of Child and Adolescent Psychiatry, 32(4), 144–153. https://doi.org/10.5765/jkacap.210

[15]. Woo, K. S., Ji, Y., Lee, H. J., & Choi, T. Y. (2021). The association of anxiety severity with health risk behaviors in a large representative sample of korean adolescents. Journal of the Korean Academy of Child and Adolescent Psychiatry, 32(4), 144–153.

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e-ISSN: 2549-5054

https://doi.org/10.5765/jkacap.210017

[16]. Ducharme JR, Collu R. Pubertal development: Normal precocious and 8. delayed. Dalam: Bailey JD, penyunting. Clinics in endocrinology and metabolism. London: Saunders; 1982. h 57-87

[17]. Ebling JP. Theneuroendocrine timing of puberty. Reproduction 2005. 129:675-683

[18]. Seminara SB Seminara SB, Messager S, Chatzidaki EE, Shagoury JK, The GPR54gene as a regulator of puberty. N.Engl J Med 2003:349:1614-27

[19]. (19) Joyce ML, Appuglise D, Kaciroti N. Weight status in young girls and the onset of puberty. Pediatrics. 2007;119: 624-30

[20]. Parent AN, Teilmann G. The timing of normal puberty and the age limits of sexual precocity; variations around the world, secular trends, and changes after migration. Endocrine reviews, 2003; 24: 668-687

[21]. Seminara SB Seminara SB, Messager S, Chatzidaki EE, Shagoury JK, The GPR54gene as a regulator of puberty. N. Engl J Med 2003:349:1614-27

[22]. Tanner JM. Foetus into Man. Edisi ke2. Inggris: Castlemead Publication,1989

[23]. Ducharne JR, Forerst MG. Normal pubertal development. Dalam: Bertrand J, Rappaport R, Sizonenko PC, penyunting. Pediatric Endocrinology. Edisi ke 2 Baltimore: William; 1993.h.372-86.

[24]. Ikatan Dokter Anak Indonesia. Diagnosis dan Tata Laksana Pubertas Prekoks Sentral Jakarta: Badan Penerbit Ikatan Dokter AnIndonesia; 2017.

[25]. Steinberg L. The fundamental changes of adolescent: biological transition [Diakses 10 Oktober 2009]. Diunduh dari http://highered.mcgraw-hill.com/sites/.