



Assessment of Adolescents' Awareness about Tanner Scale at Consultant Outpatient of Endocrine and Hormones in Central Child's Educational Hospital

Mohamed Abbar Sharhan ^{1*}, Qusay Hasan Mansi ²

¹ Lect, (PhD.) Southern Technical University, Amara Technical Institute, Iraq

² Lecture, PhD, Southern Technical University, AL-Nasiriya Technical Institute, Iraq

* Corresponding Author: **Mohamed Abbar Sharhan**

Article Info

ISSN (online): 2582-8940

Volume: 06

Issue: 02

April-June 2025

Received: 10-04-2025

Accepted: 05-05-2025

Page No: 82-86

Abstract

Background: Adolescence involves quick, comprehensive, and diversified changes and a phase of life. Children, adolescents, and adults' physical development is measured by the Tanner scale. An objective classification measure, the Tanner scale (sexual maturity rating (SMR)) tracks secondary sexual traits during puberty. The Aim of the study Adolescents' awareness about Tanner scale in Baghdad city/Iraq.

Methods: A cross sectional study was carried out in Baghdad Health ministry and Central Child's Educational Hospital, consultant outpatient of endocrine and hormones. After taking the ethical approvals from the Baghdad Health ministry and the Central Child's Educational Hospital (2/10/2024--9871), collected the sample from the consultant outpatient of endocrine and hormones during October to December 2024.

Results: According to ages, 14-18 years were more included (66.7%) than 9-13 years (33.3%) with mean (14.04 $\pm$ 3.54). both gender have same percent (50%). term Gestational age were more prevalent (67.7%) than preterm (33.3%). Cesarean Section 72.2% were more than normal 27.8%. Urban residence were 66.7%. About 55.5% of adolescent have child disease and 44.5 have not. In compatibility of adolescents' awareness about tanner scale showed that, 60 (66.7%) not compatible and IV-stage is most not compatible at significant P.value (0.021). it revealed (no significant) association between (gender, gestational age and Have child disease) factors and adolescents' awareness about tanner scale. While (significant) positive association between (age and Types of delivery) factors and adolescents' awareness about tanner scale of study group by P value < 0.05.

Conclusion: Learning about each Tanner stage can help adolescent understand what their little one is going through and better advocate for their well-being. More than half of the study participants did not have sufficient information about the tanner scale, so it is necessary to spread sufficient awareness about it among adolescents.

DOI: <https://doi.org/10.54660/IJMBHR.2025.6.2.82-86>

Keywords: adolescents, Tanner, Cesarean, endocrine

Introduction

The term 'Adolescence' originates from the Greek Latin word 'Adolescere,' signifying growth or maturation ^[1]. Adolescence is a process characterized by a sequence of diverse, quick, and significant transformations, as well as a distinct phase of life. Adolescence is a transitional phase into adulthood characterized by biological, psychological, and social transformations. A crucial normative process in adolescence is the attainment of sexual maturity, known as puberty ^[2].

Pubertal development has been empirically associated with the maturity of emotional processing functions that transcend sexual or reproductive contexts [3]. Adolescence is a captivating and intricate transition in the human lifespan, characterized by rapid growth and change, second only to infancy. It signifies a shift from childhood to adulthood, characterized by secondary sexual maturation, alterations in hormone levels, and developments in emotional, cognitive, and psychological domains [4]. The timing of developmental milestones differed among healthy children mostly due to genetic influences. Even among healthy adolescents, there is significant diversity in the timing of these developmental processes. Consequently, development assessment predicated on chronological age may be erroneous or deceptive [5]. The Tanner scale, or Tanner stages, is a metric for assessing physical development in children, adolescents, and adults. The Tanner scale, or sexual maturity rating (SMR), is an objective classification system employed to record and monitor the progression of secondary sexual characteristics during puberty. Indicators of maturity that outline distinct phases of the continuous maturation process are used to assess secondary sexual development. The most well-known evaluation tool is the Tanner Scale, which is sometimes called the Tanner Staging Technique. The work of Reynolds, Wines, Nicolson, and Hanley, among others, was utilized by Tanner in its development [6]. According to Tanner, there are five distinct phases to the processes of breast growth in females, genital development in males, and pubic hair development in both sexes. As for axillary hair development, there are three distinct phases in both sexes. Breast development is typically numbered from B1 to B5, genital development from G1 to G5, pubic hair from PH1 to PH5, and axillary hair from A1 to A3 according to the conventional nomenclature [7]. Natural variation, especially impacted by the timing of puberty, causes individuals to develop through the Tanner phases at different rates [8]. Pubertal onset can begin at a different age for men and women and can be influenced by factors such as genetics, environment, ethnicity, and food [9]. Numerous aspects need to be taken into account in clinical or epidemiological investigations that require exact pubertal phases. Individual exams are tedious, logistically difficult, and expensive when done in large numbers, and some children may feel pain during physical examinations. It may be considered unethical to conduct physical exams on children who are otherwise healthy in many cultures. Because of this, a lot of studies rely on picture or question-based self-assessment surveys, or use a pubertal development scale, wherein kids are asked to rate their own progress [10].

Method

A cross sectional study was carried out in Baghdad Health

ministry and Central Child's Educational Hospital, consultant outpatient of endocrine and hormones. After taking the ethical approvals from the Baghdad Health ministry and the Central Child's Educational Hospital collected the sample from the consultant outpatient of endocrine and hormones during October to December 2024.

The 90 children were interviewed in the counseling clinic for each Adolescent child individually after receiving permission from the parents for 15 minute. Both gender were included with ages (females between 9-16 years and males between 12-18 years). Note: Adolescence is generally defined as the period of life spanning from ages 10 to 19, according to the World Health Organization. Some researchers extend this definition up to age 24, recognizing that adolescent growth and development can continue beyond the traditional age range.

The study participants were interviewed and examined in consultant outpatient of endocrine and hormones in security area after permission parents of child, each child was given a figures of tanner scale and choose the figure that compatible to him and then ask him some questions that were prepared by the researcher and contain sex, age and residence.

Ethical approval

The investigation was regulated by the ethical principles established in the Declaration of Helsinki. Before the sample collection, the patient granted verbal and analytical consent. The study protocol, participant information, and consent form received approval from a local ethics commission, documented under number 9861 (dated 2/10/2024).

Statistical analysis

The statistical analyses were conducted utilizing SPSS (version 25.0; IBM SPSS Statistics) and employed the chi-square test. Additionally, Exile Microsoft software was employed, and the results were assessed as either ordinal data (Tanner stages 1–5) or dichotomized (1 vs 2–5) according on prepubertal or pubertal state.

Results

The precipitants were distributed by demographic variables. According to ages, 14-18 years were more included (66.7%) than 9-13 years (33.3%) with mean (14.04 $\pm$ 3.54). both gender have same percent (50%). term Gestational age were more prevalent (67.7%) than preterm (33.3%). According to the type of Adolescent delivery, Cesarean Section 72.2% were more than normal 27.8%. Urban residence were 66.7%, while 33.3% were rural. About 55.5% of adolescent have child disease and 44.5 have not, table (1)

Table 1: Distribution of The Study Sample by Demographic of Adolescents' Awareness about Tanner Scale, No.= 90 Child:

Variables	Groups	Study Sample	
		Freq.	%
Age	9-13	30	33.3
	14-18	60	66.7
	$\bar{x} \pm S.D.$	14.04 $\pm$ 3.54	
Gender	Male	45	50.0
	Female	45	50.0
Gestational age	Term	60	66.7
	Preterm	30	33.3
Types of delivery	Normal	25	27.8
	Cesarean Section	65	72.2
Have child disease	Yes	50	55.5
	No	40	44.5
Residence	Urban	60	66.7
	Rural	30	33.3

Freq.=Frequencies, %=Percentages, C.S. : Comparison Significant, $\bar{x} \pm S.D$ =Arithmetic Mean (and Std. Dev. (S.D.).

In compatibility of adolescents' awareness about tanner scale

showed that, 60 (66.7%) not compatible and IV-stage is most not compatible at significant P.value (0.021). table (2&3)

Table 2: Distribution of Total Adolescents' Awareness about Tanner Scale, No.= 90 Child:

		Frequency	Percent
Total Child Cognitive	Not Compatible	60	66.7
	Compatible	30	33.3
	Total	90	100.0

Table 3: Distribution and Association Adolescents' Awareness with Tanner Scale, No.= 90 Child:

		Adolescents' Awareness		
		Not Compatible	Compatible	
Child select stage	I	12	5	d.f= 4 Chi= 9.392 P= .021
	II	18	5	
	III	10	5	
	IV	20	5	
	V	0	10	
Total		60	30	

Chi= chi square, d.f. = degree of freedom, P = probability value.

Related to the table (4), it revealed (no significant) association between (gender, gestational age and Have child

disease) factors and adolescents' awareness about tanner scale. While (significant) positive association between (age and Types of delivery) factors and adolescents' awareness about tanner scale of study group by P value < 0.05.

Table 4: Distribution and Association Demographical data and Adolescents' Awareness about Tanner Scale, No.= 90 Child:

Demographical data		Child Cognitive		d.f	Chi	P
		Not Compatible	Compatible			
age	9-13	20	10	1	10.981	0.028
	14-18	35	25			
Gender	Male	25	20	1	0.144	0.275
	Female	30	15			
Gestational age	Term	40	20	1	0.433	0.240
	Preterm	16	14			
Have child disease	Yes	35	15	1	0.010	0.293
	No	18	12			
Types of delivery	Normal	31	29	1	0.945	0.045
	Cesarean Section	18	12			

Chi= chi square, d.f. = degree of freedom, P = probability value.

Discussion

The present study indicated that adolescents aged 14-18 exhibited greater awareness of the Tanner scale. This finding aligns with the research conducted by Sun *et al.* [11], which demonstrated that a significant percentage of individuals aged 7.9–18.9 years were able to accurately identify their own pubertal Tanner stage or closely approximate the evaluators' assessments. This study assessed the validity of self-reported sexual maturation status (SMS) and awareness of the Tanner scale among 45 girls and 45 boys representative of Baghdad teenagers. Our findings indicated that the majority of children could accurately identify their own SMS or closely align with the raters' evaluations by utilizing realistic, colored photos of pubertal growth, leading in moderate to nearly perfect agreement. There were several distinctions between the current study and prior investigations concerning participants and methodologies. Both non-obese and obese boys and girls were able to have their SMS disparities between self-assessment and rater assessment thoroughly compared thanks to the large and

representative sample size. The majority of the relevant research conducted in the past included more than 100 youths. Researchers Chan *et al.* [12] looked at 8–18 year olds, 172 males and 182 girls. Very little is known about how obesity affects the evaluation of adolescent sexual development. In their study, Lee *et al.* [13] only looked at 77 kids and teens who were severely obese. As a result, it is important to recognize that their investigation had low power due to its small sample size. These conflicting findings can be due, in large part, to differences in age distribution or sexual maturity levels. Many of the subjects in earlier studies were still in the early stages of sexual maturation and were younger than fifteen years old. Overweight adolescents' self-assessments on their sexual maturation throughout a 15-year period and at later stages of sexual maturity cannot be expected to be accurate. The wide age range of 7.9–18.9 years in our study allowed us to analyze subjects in both the early and late Tanner phases. Adolescence, according to Jimenez *et al.* [14], is characterized by complex biopsychosocial processes impacted by cultural influences, and it occurs between infancy and adulthood. As people move from childhood to adulthood, they go through a number of developmental stages, including coming into one's own

sexually, forming one's identity, becoming more self-reliant, forming close relationships, and deciding whether to continue their education or pursue their career. Epigenetic pathways shape adolescent health and disease in response to a complex interplay of biological, psychological, and social variables. Unfavorable life experiences can cause allostatic stress, which can negatively impact growth during this phase. The sexual maturity rating scale or the Tanner stages can be used to determine if adolescence follows a predictable pattern. Clinicians can use this tool to evaluate and monitor the development of both sexes as they enter puberty. Teens' growth and development can be gleaned from the order and timing of puberty. Before you may notice variations, you must understand the phases of puberty and the usual outcomes.^[15] According to research by Campisi *et al.*^[16], when it comes to identifying the several stages of puberty—pre-, during-, and post—and identifying Tanner stage 1 and Tanner stage 5, self-assessment is the most accurate method. There needs to be a well-structured plan for using self-evaluation results. Findings from the study by Elhakeem *et al.*^[17] shed light on the various markers of pubertal timing and their importance in life-course research, since they quantify the onset and progression of puberty. The reliability of self-evaluation has been the subject of conflicting results in the past^[18]. While some studies found reasonable agreement between self-evaluation and medical professional assessment, others found discrepancies.^[19] Sun *et al.*^[11] found that a significant percentage of individuals aged 7.9 to 18.9 years were able to appropriately identify their own pubertal Tanner stage or closely align with the evaluators' findings. The obese group generally overestimates their pubertal development relative to their non-obese counterparts, with the exception of genital assessment in males. The self-evaluation of pubertal stages utilizing realistic color graphics may serve as a superior assessment tool for extensive epidemiological puberty research in comparison to Tanner's original black and white illustrations.

Conclusion

Learning about each Tanner stage can help adolescent understand what their little one is going through and better advocate for their well-being. More than half of the study participants did not have sufficient information about the tanner scale, so it is necessary to spread sufficient awareness about it among adolescents.

Limitation

There were some restrictions during the study, as there was shyness and lack of response to the study topic by some adolescents, considering it a sensitive topic for them.

Reference

- Menkiti BU. Adolescent psychology: An overview. 2019.
- Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *The Lancet Child & Adolescent Health*. 2018 Mar 1;2(3):223-8.
- Krasniqi E, Cakirpaloglu P. The role of puberty in adolescent development. *PhD Existence*. 2020;10:241.
- Lewis ME. Exploring adolescence as a key life history stage in bioarchaeology. *American Journal of Biological Anthropology*. 2022 Dec;179(4):519-34.
- Kollur LR, Pratinidhi AK, Kakade SV. Pubertal changes in adolescent girls: A community-based cross-sectional study. *National Journal of Community Medicine*. 2013;4(4):640-3.
- Corbett BA, Muscatello RA, Tanguturi Y, McGinn E, Ioannou S. Pubertal development measurement in children with and without autism spectrum disorder: A comparison between physical exam, parent- and self-report. *Journal of Autism and Developmental Disorders*. 2019;49(12):4807-19. doi:10.1007/s10803-019-04192-w.
- Bauman D. Impact of obesity on female puberty and pubertal disorders. *Best Practice & Research: Clinical Obstetrics & Gynaecology*. 2023;102400.
- Gerván P, Oláh G, Utzcsák K, Tróznai Z, Berencsi A, Gombos F, Kovács I. The influence of relative pubertal maturity on executive function development in adolescent girls. *Scientific Reports*. 2024 Nov 15;14(1):28140.
- Mouritsen A, Aksglaede L, Sørensen K, *et al.* Hypothesis: Exposure to endocrine-disrupting chemicals may interfere with timing of puberty. *International Journal of Andrology*. 2010;33(2):346-59.
- Monteilh C, Kieszak S, Flanders WD, *et al.* Timing of maturation and predictors of Tanner stage transitions in boys enrolled in a contemporary British cohort. *Paediatric and Perinatal Epidemiology*. 2011;25(1):75-87.
- Sun Y, Tao FB, Su PY, China Puberty Research Collaboration. Self-assessment of pubertal Tanner stage by realistic colour images in representative Chinese obese and non-obese children and adolescents. *Acta Paediatrica (Oslo, Norway: 1992)*. 2012;101(4):e163-e166. doi:10.1111/j.1651-2227.2011.02568.x.
- Chan NP, Sung RY, Kong AP, Goggins WB, So HK, Nelson EA. Reliability of pubertal self-assessment in Hong Kong Chinese children. *Journal of Paediatrics and Child Health*. 2008;44:353-8.
- Lee K, Valeria B, Kochman CRN, Lenders CM. Self-assessment of height, weight, and sexual maturation: Validity in overweight children and adolescents. *Journal of Adolescent Health*. 2002;39:346-52.
- Jimenez AL, Banaag Jr CG, Arcenas AMA, Hugo LV. Adolescent development. In: Tasman A, editor. *Tasman's Psychiatry*. Cham: Springer International Publishing; 2023. p. 1-43.
- Hamlin A, Robertson M, Wilson DR. Tanner stages and pubertal development. *Journal of Pediatric Surgical Nursing*. 2022;11(4):131-6. doi:10.1097/JPS.0000000000000354.
- Campisi SC, Marchand JD, Siddiqui FJ, Islam M, Bhutta ZA, Palmert MR. Can we rely on adolescents to self-assess puberty stage? A systematic review and meta-analysis. *The Journal of Clinical Endocrinology & Metabolism*. 2020;105(8):2846-56.
- Elhakeem A, Frysz M, Goncalves Soares A, Bell JA, Cole TJ, Heron J, Howe LD, Sebert S, Tilling K, Timpson NJ, Lawlor DA. Evaluation and comparison of nine growth and development-based measures of pubertal timing. *Communications Medicine*. 2024;4(1):159.
- Lertsakulbunlue S, Kantiwong A. Development and validation of immediate self-feedback very short answer questions for medical students: Practical implementation of generalizability theory to estimate reliability in formative examination designs. *BMC Medical*

Education. 2024 May 24;24(1):572.

19. Alfakhry G, Mustafa K, Alagha MA, Milly H, Dashash M, Jamous I. Bridging the gap between self-assessment and faculty assessment of clinical performance in restorative dentistry: A prospective pilot study. Clinical and Experimental Dental Research. 2022 Aug;8(4):883-92.