Journal of Bionursing
2024, VOL.6, NO. 3, 313-317

Activity Level, Body Mass Index, and Postural Habits Awareness in Adolescents

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ABSTRACT

Background: Early adolescence is a period of growth and development marked by the onset of puberty, where important changes occur in psychological development and social roles. Excessive internet use, especially in adolescents at this time, causes health problems such as postural disorders, sedentary lifestyles, and unbalanced nutrition. Objective: This study was planned to investigate the level of activity, body mass index and habits and awareness of posture in early adolescents.
Method: Measurements of body weight, height were carried out, participants filled out a questionnaire on knowledge of posture, knowledge of ergonomics and a questionnaire on postural habits awareness.
Results: Participants were 33 children aged 11-17 years. Knowledge of posture at a high level was 17 adolescents (51.5%). Knowledge of musculoskeletal disorders at a moderate level was 26 adolescents (78.78%). Posture habits were mostly at a good level as many as 29 adolescents (87.9%).
Conclusion: The level of activity of adolescents was mostly at a moderate level and nutritional status based on BMI was mostly in the thin category. Knowledge of posture, ergonomics and habits and awareness of posture is at medium and high levels. Indicating adequate information has been obtained by participants.

KEYWORDS
Posture, body posture, adolescents, bone disorders, muscles

INTRODUCTION

The dramatic lifestyle changes during the Covid-19 pandemic, resulting in immobilization, quarantine, and physical inactivity, especially in adolescents, can cause various health problems. Musculoskeletal disorders (MSDs) increase in risk in adolescents because muscle and bone development in adolescents is still immature. Bone structure health or posture due to incorrect posture when studying and doing activities such as lying down while holding a cellphone, sitting statically bent over for a long time in front of a laptop monitor, back and arm positions that are tilted right and left and so on (Nani & Pratiwi, 2023) Musculoskeletal Disorders (MSD) in adolescents is characterized by the presence of pain or discomfort (Martins, et.al. 2018). This is a nosological entity that affects muscles, nerves, intervertebral discs, joints, cartilages, tendons, and ligaments, and may occur on spesific occasions, systematically or chronically. This entity etiology can be genetic or acquired, and affects- to a greater or lesser extent, daily tasks and the individuals'quality of life (Martins, et.al.2020).

During puberty there is asymmetry in the development, because bones grow more quickly than tendons and muscles, and this is especially true at the level of the spine. Teenagers typically have a rounded back posture that might result in lesions because they typically go through a period of reflection, sensitivity, and even body shame while they adjust to their new body (Martins, et.al.2020). Complaints of rapid fatigue, difficulty concentrating, slow response, the emergence of stiffness in the neck, back, and tingling extremities appear too early in adolescents in Banyumas. This needs to be watched out for so that it does not continue

to more serious health problems such as nerve disorders, muscle spasms, tissue perfusion disorders, and heart and blood vessel disorders.

METHOD

The study involved 33 male adolescents in Banyumas in September 2024. Body weight and height measurements were taken, participants filled out a questionnaire on knowledge of posture, knowledge of ergonomics and a questionnaire on postural habits awareness.

RESULTS AND DISCUSSION

Participants aged 11-17 years (13.58 years ± 1.69) as many as 26 teenagers came from junior high schools and as many as 7 teenagers from high schools. The weight range of educational participants was from 23 kg to 77 kg (45.03 kg ± 11.25). The height range of educational participants was from 134 cm to 181 cm (159.8 cm ± 10.68) (Table 1).

Table 1. Demographic characteristics of participants (n=33)

Variable	Mean ±SD	Min-max
Age	13,58 ± 1,69	11-17
Weight	45,03 ± 11,25	23-77
Height	159,8 ± 10,68	134-181

Nutritional status, activity level, knowledge of posture, knowledge of musculoskeletal disorders and awareness of posture habits are shown in Table 2. The majority of participants felt thin nutritional status as many as 22 adolescents (66.7%). The level of activity of adolescents felt at a moderate level as many as 28 adolescents (84.8%). Having knowledge of posture at a high level as many as 17 adolescents (51.5%). Having knowledge of musculoskeletal disorders at a moderate level as many as 26 adolescents (78.78%). Posture habits in adolescent participants were mostly at a good level as many as 29 adolescents (87.9%).

Table 2. Nutritional status, activity, posture knowledge, MSDs knowledge, Postural Habits Awareness in Adolescents (n=33)

Variabel		f (33)	%
Nutritional status	Underweight	22	66,7
	Normal	10	30,3
	Overweight	1	3,0
Activity	Low	2	6,1
	Medium	28	84,8
	Heavy	3	9,1
Posture knowledge	Low	5	15,2
	Moderate	11	33,3
	HIgh	17	51,5
MSDs knowledge	Low	0	0
	Moderate	26	78,78
	High	7	21,22
Postural habits awareness	Good	29	87,9
	Bad	4	12,1

Post-COVID-19 pandemic musculoskeletal disorders have increased in frequency in adolescents and school-age children. Archives of Disease in Childhood reported that 61.4% of students aged 12-17 years experienced musculoskeletal disorders, especially lower back pain. The prevalence of musculoskeletal disorders in school-age children in Indonesia aged 11 years increased by 12% and in children aged 15 years increased by 50% (Sariana and Sudarsono, 2020).

Previous studies have found a relationship between duration and sitting posture with the incidence of low back pain (LBP). Sitting for more than 4 hours is 1.661 times higher risk of experiencing LBP, and a hunched sitting position is 2.657 times higher risk for LBP injury (Harkian, Dewi, and Fitraningrum, 2014). This is supported by the increasing intensity of electronic device use during the pandemic and post-COVID-19 pandemic with an average of 11.6 hours per day for adolescents (Ministry of Health, 2020).

Participants were 11-17 years old and male. In this age range, muscles do not yet have maximum strength and bone growth is not yet mature, where maximum muscle strength occurs at the age of 20-29 years. Less than maximum muscle strength and immature bones can be risk factors for musculoskeletal disorders in adolescence (Tarwaka, 2010).

Long-term online learning activities can increase sitting time per day, and the prevalence of LBP is the disorder most often associated with the length of time sitting for online activities (Shan et al., 2013). Physical inactivity for adolescents to be active has been reported to increase musculoskeletal complaints, especially LBP (Toprak et al., 2020).

The knowledge of adolescents about various types of muscle and bone disorders in this study was at a moderate level of 26 adolescents (78.78%). A good level of ergonomic knowledge in adolescents is possible because the majority of students are accustomed to using smartphones or other electronic devices, making it easier for them to access information about good body positions while studying. Knowledge about good posture habits in various activities can be applied by adolescents to overcome musculoskeletal complaints to align their tasks in the learning process (Mayasari and Saftarina, 2016). Ergonomic knowledge is very much needed by adolescents because students are not yet fully aware of the negative impacts on health from the use of electronic devices without implementing the right ergonomic attitude (Agnes & Saliza, 2016). Ergonomic positions that are important and must be done to prevent injury such as computer positions, sitting postures when writing, postures when sitting on a bench, postures when picking up or lifting objects from the floor, and reading or studying postures in bed (Mayasari & Saftarina, 2018; Noll et al., 2016). Good ergonomic knowledge is associated with decreased incidence of back pain in students. Good knowledge can stimulate positive behavior in implementing good physical ergonomic behavior so that it can reduce complaints of back pain in students.

CONCLUSION

Most adolescents have been active at a moderate level, have good knowledge about correct posture in activities.The level of adolescent activity is at a moderate level of 28 adolescents (84.8%). As many as 17 adolescents (51.5%). Have high knowledge about correct posture As many as 26 adolescents (78.78%) already have moderate knowledge about various disorders Awareness and habits of posture in adolescent participants are mostly at a good level of 29 adolescents (87.9%).

Awareness and habits of good posture are very important for adolescents considering that the period of bone and muscle growth and development at this time is greatly influenced by posture habits in various activities. Children and adolescents need information and education about the importance of awareness of correct posture in various activities and recognizing the dangers of musculoskeletal disorders, especially the spine. Good and optimal bone and muscle growth is a long-term health investment so that productivity and quality of life are maintained until the next period.

ACKNOWLEDGEMENTS

The author would like to thank the Ministry of Research, Technology and Higher Education through the BLU Unsoed Grant for funding this research through the Research-Based PKM Grant.

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