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Paediatrics

THE RELATIONSHIP OF SHORT STATURE AND LEARNING ACHIEVEMENT IN SINGKUANG PRIMARY SCHOOL, MUARA BATANG GADIS DISTRICT, MANDAILING NATAL REGENCY

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ABSTRACT

Background: The prevalence of short stature in Indonesia was 18.4% in 6-12 years old. North Sumatera was one of the highest short stature prevalence with 37% cases. Previous research reported that short stature impaired significantly to learning achievement at school. Children with short stature have impaired ability to think and learn so that learning achievement is lower.
Aim: To assess the relationship of short stature and learning achievement in primary school.
Method: A cross sectional study was conducted in February-July 2016 in Sinkuang primary school by consecutive sampling. The inclusion criteria in the form of school age children are 6-12 years old, registered in primary school and present at the examination, get permission from parents or guardians and with short stature. The exclusion criteria in the form of children aged >12 years and not present in the sampling. Learning achievement data was collected from end of semester report card data such as Indonesian, Mathematics and total scores of all subjects. The score criteria was average 80-100, sufficient 60-79.9, and less than 60. Chi-square test was used to analyze the short stature relationship and learning achievement and p value <0.05 was considered significant.
Result: Of 312 children, 106 (33.9%) was short stature and 206 (66.1%) was normal in height. The score criteria of both group was sufficient. Chi-square test showed that there were no differences in short stature with Indonesian, mathematics and total scores of all subjects (p> 0.05).
Conclusion: There was no relationship of short stature and learning achievement in primary school.

KEYWORDS : short stature, learning achievement, primary school.

INTRODUCTION

One of the important early life cycle stages is school age children. Children are considered as the largest national resource of any country that will build the nation's future.[1,2] School children according to the WHO (World Health Organization) definition is a group of children aged between 7-15 years, whereas in Indonesia it is generally children aged 6 - 12 years.[3,4] Learning achievement is the mastery of knowledge or skills developed by subjects, usually indicated by test scores or grades given by the teacher.[4]

Short stature is a terminology for height below the 3rd or -2th SD in the growth curve that applies to that population or the NCHS (National Center for Health Statistics) standard curve.[5,6] The prevalence of short stature in Indonesia is still high. The national prevalence of short stature in children aged between 5-12 years is 18.4%. North Sumatra is one of the provinces with a prevalence of short stature above 37%.[7] In a preliminary study in Singkuang village, Muara Batang Gadis Subdistrict, Mandailing Natal District, North Sumatra, the prevalence of children with short stature was 40%.

Based on Picauly's 2013 study, elementary school children in Kupang and East Sumba, short stature has a very significant impact on children's learning achievement where as 31.75% of children with short stature have less learning achievement of 18.39%. Short stature disrupts students' thinking and learning abilities and ultimately their attendance and learning achievement will decrease compared to children of normal height.[8] Sarma's 2014 study, elementary school students in

Nuwara Eriya, Sri Lanka, showed that there was a relationship between short stature and learning achievement compared to normal children.[2]

The main objective of this study is to assess the relationship of short stature and learning achievement in Sinkuang primary school.

METHODS

Study Design

A cross sectional study was conducted in February until July 2016 in Sinkuang primary school by consecutive sampling. The inclusion criterias were school age children between 6-12 years old, registered in primary school and present at the examination, get permission from parents or guardians and short stature. The exclusion criterias were children aged >12 years and absent while sampling. This study was approved by the Health Research Ethics Committee of The medical faculty, Universitas Sumatera Utara.

All students who fulfilled the inclusion criterias were enrolled in this study after given consent. We interviewed student to obtain demographic data. Height measurements were collected by using microtoise dan calculated based on the CDC 2000 growth curve. Learning achievement datas was collected from end of semester report card data such as Indonesian, Mathematics and total scores of all subjects. The score criteria was average 80-100, sufficient 60-79.9, and less below 60. All data is recorded in research status, collected and then processed using computer software. Chi-square test was

used to analyze the short stature relationship and learning achievement and p value <0.05 was considered significant.

RESULTS

The study was conducted in two primary school in Singkuang village. The minimum sample size for this study was 43 children. Of the 312 children found as many as 106 children (33.9%) with short stature and 206 children (66%) with normal stature who met the inclusion and exclusion criteria were taken by consecutive sampling. Subjects of children with short stature consisted of girls were 57 people (53.8%) while in normal stature there were 97 children (47.1%). The mean age in the short stature group was 9.97 years and in the normal stature group was 9.57 years. Table 1 shows the demographic characteristics of subjects.

Chi-square test was used to analyze the short stature relationship and learning achievement (p<0.05). Table 2, table 3 and table 4 shows that the difference learning achievement in Indonesian, mathematics and total scores of all subjects.

Tabel 1 Demographic characteristics of subjects

Characteristics	Short stature	
	Yes (n = 106)	No (n = 206)
Gender, n (%)		
Boys	49 (46.2)	109 (52.9)
Girls	57 (53.8)	97 (47.1)
Age, mean (SD)	9.97 (1.71)	9.57 (1.95)
Parents education, n (%)		
Primary school	74 (69.8)	131 (63.6)
Junior high school	12 (11.3)	36 (17.5)
High school	13 (12.3)	25 (12.1)
Collage	3 (2.8)	7 (3.4)
No school	4 (3.8)	7 (3.4)
Nutritional status, n (%)		
Normal	54 (50.9)	85 (41.3)
Mild	39 (36.8)	88 (42.7)
Severe	4 (3.8)	20 (9.7)
Overweight	6 (5.7)	7 (3.4)
Obesity	3 (2.8)	6 (2.9)
Parents' occupation, n (%)		
Fisherman	20 (18.9)	24 (11.7)
Farmer	42 (39.6)	90 (43.7)
Government employee	1 (0.9)	8 (3.9)
Laborer	7 (6,6)	13 (6.3)
Entrepreneur	36 (34.0)	71 (34.5)
Family income, n (%)		
< Rp. 500,000	16 (15.1)	24 (11.7)
Rp. 500,000 – Rp. 1,000,000	66 (62.3)	97 (47.1)
> Rp. 1,000,000	24 (22.6)	85 (41.3)

Table 2 Difference learning achievement in Indonesian subject

	Learning Achievement		
	Average	Sufficient	Less
Short stature			
Yes (n = 106)	27 (25.5)	79 (74.5)	0 (0)
No (n = 206)	37 (18,0)	167 (81.1)	2 (1.0)
P	0.189*		

*chi-square test

Table 3 Difference learning achievement in mathematics subject

	Learning Achievement		
	Average	Sufficient	Less
Short stature			
Yes (n = 106)	13 (12.3)	91 (85.8)	2 (1.9)
No (n = 206)	25 (12.1)	171 (83.0)	10 (4.9)
P	0.434*		

*chi-square test

Table 4 Difference learning achievement in total score of all subjects

	Learning Achievement		
	Average	Sufficient	Less
Short stature			
Yes (n = 106)	9 (8.5)	97 (91.5)	0 (0)
No (n = 206)	11 (5.3)	192 (93.2)	3 (1.5)
P	0,286*		

*chi-square test

DISCUSSION

Linear growth can be influenced by ethnicity, genetic, hormonal, psychosocial, nutrition, chronic diseases, and other environmental factors. Disorders of linear growth will result in short stature.[9] Short stature is not actually a disease.[10] One of the important early life cycle stages is school-age children. Basic education is an important stage in the development of children's awareness and personality.[1,2] In elementary school children and adolescents with short stature experience negative perceptions about physical conditions and difficulties in psychosocial compared to physical limitations. They might have the experience of depression, anxiety, bullying in school and be isolated in the social world which results in changes in behavior, decreased interpersonal skills, low learning achievement and poor quality of life.[11]

Although learning achievement and intelligence are related concepts, overall intelligence measurement generally only explains less than half of the different learning achievements namely in differences in personality and the process of receiving information, school environment, family, mental health, and social environment that influence.[12] Learning achievement the bad ones are directly or indirectly related to short stature.[13] In previous studies, a statistically significant relationship between height and intelligence and learning achievement was thought to reflect the majority of social losses.[12]

In previous studies reported that learning achievement was influenced by children's height where children with short stature had worse learning achievement.[2,8,14] Whereas in this study showed that there was no relationship of short stature with learning achievement and there were no differences in learning achievement in children short stature and normal stature. This is consistent with research conducted in Saudi Arabia cross-sectionally in 656 children aged 4-18 years who reported that short stature as a negative impact on learning achievement. In that study there was no significant relationship between children's height and learning achievement.[13]

In a systematic review study, of 9 studies evaluating the learning achievement of about 900 children with short stature. Overall, 4 studies found a value of learning achievement in or above the normal population, while 5 other studies reported learning achievement values below the normal population. Although the study found a small decrease in learning achievement scores, no definitive conclusions can be made due to the small number of subjects, exclusion criteria in children with low IQs, and lack of statistical analysis.[15]

The Wessex Growth study assessed the intellectual functioning of 81 short stature children and 78 controls, drawn from a population of more than 14,000 children who entered school, and reported that scores were lower on IQ tests, counting and reading at 11-13 years but not at age 7-9 years.[12]

There are some limitations of this study. Further research is needed to determine the learning achievement of short stature

children by assessing report card grades for 2 semesters and assessing cognitive functions and IQ scores to assess a child's ability to follow the learning process.

CONCLUSION

There was no relationship between short stature and learning achievement in primary school children in Singkuang village.

REFERENCES

1. Yasmin, G., Kustiyah, L., Dwiriani, C.M. (2014), ''Risk factors of stunting among school-aged children from eight provinces in Indonesia.'' Pakistan J Nut,13,557-66.
2. Sarma, G.M.S., Wijesinghe, D.G.N.G., Sivananthawer, T. (2013), ''The effects of nutritional status on educational performance of primary school children in the plantation sector in Nuwara Eliya Educational Zone.'' Tropical Agricultural Research,24,203-14.
3. Oktavianingtyas, E. (2013), ''Studi tentang faktor-faktor yang mempengaruhi prestasi belajar mahasiswa program studi pendidikan matematika FKIP Universitas Jember.'' Kadikma,4,13-26.
4. Udu, W.S.A. (2010), Hubungan antara status gizi dengan prestasi belajar siswa sekolah dasar.
5. Batubara, J.R.L, Susanto, R., Cahyono, H.A. (2013), ''Pertumbuhan dan gangguan pertumbuhan. In: Buku Ajar Endokrinologi Anak. Editor Batubara, J.R.L., Tridjaja, B., Pulungan, A.B. Edisi ke-2.'' Badan Penerbit IDAI:Jakarta. Pp.29-32.
6. Batubara, J.R.L, Tridjaja, B., Pulungan, A.B., Aditiawati, Soenggoro, E.P, Faizi, M., et al. (2009) ''Perawakan pendek. In: Pedoman Pelayanan Medis Ikatan Dokter Anak Indonesia. Editor Pudjiaji, A.H., Hegar, B., Handryastuti, S., Idris, N.S., Gandaputra, E.P, Harmoniati, E.D.'' Jakarta : Badan Penerbit IDAI:Jakarta. Pp.243-49.
7. Riset Kesehatan Dasar 2013. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia tahun 2013.
8. Picauly, I., Toyl, S.M. (2013), ''Analisis determinan dan pengaruh stunting terhadap prestasi belajar anak sekolah di Kupang dan Sumba Timur, NTT.'' JGP,8,55-62.
9. Batubara, J.R.L., Tjahjono, H.A., Aditiawati. (2017), ''Perawakan pendek pada anak dan remaja di Indonesia.'' Badan Penerbit IDAI:Jakarta. Pp.1-6.
10. Nwosu, B.U., Lee, M.M. (2008) ''Evaluation of Short and Tall Stature in Children.'' Am Fam Physician,78,597-604.
11. Gopal-Kothandapani, J.S., Banerjee, I., Patel, L. (2011) ''Growth: importance and implications of variations. In: Practical paediatric endocrinology in a limited resource setting. Editor Zacharin M.'' Australia. Pp. 1-19.
12. Voss, L.D., Bailey, B.J., Mulligan, J., Wilkin, T.J., Betts, P.R. (1991) ''Short stature and school performance--the Wessex Growth Study.'' Acta Paediatr Scand,377,29-31.
13. Al-Agha, A.E., Jammal, H.H., Alzahrani, O.A., Sherian, K.A. (2016) ''The Impact of Short Stature on the Children's Psychology: An Examination of Child Psychology, Peer and Familial Relationships and Academic Performance.'' J Preg Child Health,2,1-3.
14. Mukudi, E. (2003) ''Nutrition status, education participation, and school achievement among Kenyan middle-school children.'' Nutrition,19,612-16.
15. Wheeler, P.G., Bresnahan, K., Shephard, B.A., Lau, J., Balk, E.M. (2004) ''Short stature and functional impairment : a systematic review.'' Arch Pediatr Adolesc Med,158,236-43.