

# Quality of Life Difference between Children with Obesity and Children without Obesity

Nelsi Marintan Tampubolon<sup>1\*</sup>, Endang Dewi Lestari<sup>2</sup>, Andri Iryawan<sup>1</sup>, Siti Munawaroh<sup>3</sup>

1. Fakultas Kedokteran Universitas Sebelas Maret
2. Bagian Ilmu Kesehatan Anak RSUD Dr. Moewardi
3. Laboratorium Anatomi Fakultas Kedokteran Universitas Sebelas Maret

## ABSTRAK

**Pendahuluan:** Obesitas telah menjadi masalah kesehatan global karena obesitas tersebar luas di banyak negara dan perlu mendapat perhatian dan penanganan yang tepat. Obesitas dapat menimpa siapa saja, termasuk anak-anak dan remaja. Hal ini dapat mempengaruhi kondisi fisik dan mental yang dapat mempengaruhi kualitas hidup mereka. Penelitian ini bertujuan untuk mengetahui apakah ada perbedaan kualitas hidup anak obesitas dan non obesitas di SMP Warga Kota Surakarta.

**Metode Penelitian:** Penelitian observasional analitik dengan pendekatan *cross sectional* melibatkan 66 siswa yang dibagi menjadi 2 kelompok. Masing-masing kelompok terdiri dari 33 siswa yang ditentukan dengan teknik *purposive sampling*. Pengukuran berat badan dilakukan untuk mendapatkan data status obesitas, sedangkan kualitas hidup siswa diukur dengan skor *Pediatric Quality of Life Inventory* (PedsQL) versi 4,0. Data yang diperoleh dianalisis dengan uji t tidak berpasangan.

**Hasil:** Kelompok anak dengan obesitas dan non obesitas berturut-turut memiliki rerata skor PedsQL 78,385, dan 83,807. Uji t tidak berpasangan pada kedua kelompok menunjukkan nilai p sebesar 0,056.

**Kesimpulan:** Tidak ada perbedaan kualitas hidup antara siswa yang mengalami obesitas dengan siswa yang tidak obesitas.

**Kata Kunci:** anak; kualitas hidup; obesitas; remaja

## ABSTRACT

**Introduction:** Obesity has become a global health problem because obesity is widespread in many countries and needs to be addressed immediately. Obesity can happen to anyone, including children and adolescents. Obesity in children can affect physical and mental conditions that can affect the quality of life. This study aims to determine whether there are differences in the quality of life of obese and non-obese children in Warga Junior High School Surakarta

**Research Methods:** An analytical observational study with a cross-sectional approach involved 66 students who were divided into 2 groups. Each group consisted of 33 students who were determined by the purposive sampling technique. Weight measurement was carried out to obtain data on obesity status, while the quality of life of students was measured by the *Pediatric Quality of Life Inventory* (PedsQL) score version 4.0. The data obtained were analyzed by unpaired t-test.

**Results:** The obese and non-obese children had a mean PedsQL score of 78,385 and 83,807, respectively. The unpaired t-test in both groups showed a p-value of 0.056.

**Conclusion:** The quality of life of obese and non-obese students Warga Junior High School Surakarta was not significantly different.

**Keywords:** children; quality of life; obesity; adolescent

## INTRODUCTION

According to WHO, quality of life is individual perception towards their position in life, in the context of their culture and value, related to goal, expectation, living standard, and concern<sup>1</sup>. Quality of life becomes an important indicator for everybody, including school children.

**Correspondence:** Nelsi Marintan Tampubolon, dr., Fakultas Kedokteran Universitas Sebelas Maret, nelsi\_marintan@yahoo.com

Assessment of quality of life in children include physical health, emotion, social, and academic performance<sup>2,3,4</sup>.

According to WHO, the definition of overweight or obesity is abnormal or excessive fat accumulation which can cause harm towards health<sup>5</sup>. Obesity prevalence is increasing fastly in the last decade both in developed or underdeveloped country. Hence, it makes a global health problem that should be managed immediately<sup>5,6</sup>.

In 2013, WHO reported there were about 42 millions children under 5 years old with overweight. In 2014, the prevalence of overweight in children under 18 was 39% and obese was 13%<sup>6</sup>. Obesity prevalence in children increase eight fold between 1975 to 2016 in age group of 5-19 years. There were more than 340 million overweight or obese children in 2016. Prevalence of children under 5 with overweight of obesity was more than 38,2 million children in 2019<sup>7</sup>.

According to Riset Kesehatan Dasar (Riskesdas) in 2013, prevalence of excessive weight in adolescents aged 13-15 years was 10,8% which consisted of 8,3% overweight and 2,5% obese. In age group of 16-18, the prevalence was 7,3%, consisted of 5,7% overweight and 1,6% obese<sup>8,9</sup>. Prevalence of obesity in Central Java province was higher than national prevalence for the age group of 16-18 years<sup>7,8</sup>. According to Riskesdas (basic health research) of Central Java province in 2013, prevalence of excessive weight in adolescents aged 13-15 years is 9,5%, consisted of 7,1% overweight and 2,4% obese while in age group of 16-18, the prevalence is 7,1% (5,4% overweight and 1,7% obese)<sup>8,10</sup>. The prevalence tend to increase over the years. National prevalence in 2018 was 20,0% in age group of 5-12, consisted of 11,2% overweight and 4,8% obese, 7,3% in age group of 16-18, consisted of 9,5% overweight and 4,0% obese<sup>11</sup>.

The effect of obesity is not only physical health disturbance but also psychosocial one. Thus, obesity can greatly affect quality of life. The problem caused by obesity have both short term and long term impact, including cardiovascular diseases, diabetes mellitus, cancer, breathing disturbance (asthma and sleep apnea), growth disturbance, depression, and anxiety<sup>12,13,14</sup>.

Some studies documented the difference in quality of life between children with or without obesity. The lower average score was found in obesity group. This score can be measured using Pediatric Quality of Life Inventory (PedsQL). The lower score in quality of life can be caused by depression in children with obesity. There were at high risk to have anxiety and discrimination from their peers<sup>4,15,16,17</sup>. Based on the previously mentioned, this study aims to assess the difference between quality of life in children with and without obesity in SMP Warga Surakarta.

## METHOD

This study is a cross sectional study that was done in SMP Warga, Surakarta city. Sample was gathered from population of Warga Junior High School that fulfilled the inclusion criteria and didn't have any of the exclusion criteria. There were 66 subjects in this study, consisted of 33 teenagers with obesity and 33 children without obesity. Samples were gathered using purposive sampling technique. The inclusion criteria are students from class VII to IX and signing informed consent form. The exclusion criteria are students with edema and visible congenital defect, consuming long term medicine, post surgery with hyphema, and students with chronic disease such as asthma, heart disease, kidney disease. All data in this study were taken using several instruments, such as informed consent form, identity form, PedsQL questionnaire 4.0 version, microtoise, scale with accuracy of 0,1 kg, and CDC growth chart (2000).

Children with obesity and without obesity is independent variable with nominal scale. Children with percentile  $\geq 5$  to  $< 85$  were categorized as normal weight, meanwhile children with

percentile  $\geq 95$  were categorized as obese<sup>4</sup>. Measurement was done by calculating Body Mass Index (BMI) then plotting it in CDC growth chart (2000). There were two different charts: for boys and for girls. Quality of life is dependent variable with interval scale, with range of 0-100. It's considered low if physical health, psychosocial health, emotional functioning, school functioning, and social functioning  $< 80$ . Measurement of quality of life was performed using PedsQL questionnaire 4.0 version<sup>4</sup>.

Data was processed using Statistical Product and Serve Solution (SPSS) for Windows. Data obtained in this study was analysed using independent t-test, which was used to find out whether there was significant difference in quality of life of children with obesity and without obesity in SMP Warga, Surakarta city.

## RESULT AND DISCUSSION

Subjects in this study are 66 respondent with age range of 12 to 15 years, consisted of 33 obese children and 33 non obese children. This study used purposive sampling method to choose sample. Samples were taken on September 21<sup>st</sup> to 30<sup>th</sup>, 2013. Data was obtained by asking some direct questions towards respondents. The questions were related to PedsQL questionnaire. PedsQL questionnaire is consisted of questions about physical function, emotional function, social function, and school function. The questions asked were general and easy to understand for both researcher and the subjects.

Table 1. Quality of life

Quality of Life	Children with Obesity		Children without obesity	
	n	%	n	%
Good (80-100)	18	54,5	24	72,7
Poor (0-80)	15	45,5	9	27,3

Table 2. Percentage of quality of life domain

Quality of life domain	BMI status	Quality of Life	
		Good n(%)	Poor n(%)
Physical function	Obese	19 (57,6)	14 (42,4)
	Non obese	31 (93,9)	2 (6,1)
Emotional function	Obese	14 (42,4)	19 (57,6)
	Non obese	15 (45,5)	18 (54,5)
Social function	Obese	25 (75,8)	8 (24,2)
	Non obese	23 (69,7)	10 (30,3)
School function	Obese	16 (48,5)	17 (51,5)
	Non obese	20 (60,6)	13 (39,4)

Tabel 3. Average of quality of life domain

Quality of life domain	BMI status	Average	Maximum score	Minimum score
Physical function	Obese	80,97	100	43,75
	Non obese	92,80	100	75
Emotional function	Obese	71,06	100	40
	Non obese	76,67	100	55
Social function	Obese	85,30	100	50
	Non obese	86,97	100	40
School function	Obese	76,21	100	50
	Non obese	78,79	100	50

Tabel 4. Result of Independent t-test Analysis

BMI status	n	Mean	Deviation standard	p
Obese	33	78,39	13,14	0.056
Non obese	33	83,81	9,06	

Obesity was part of environment factor that can affect quality of life. In this study, the function domain that was disturbed the most in obese children was emotional function. There were 19 children with proportion of 57,6%. This result corresponds well with the study by Rankin et al<sup>13</sup> that stated adolescents with obesity were more at risk in experiencing emotional dysfunction compared to adolescents without obesity. It is also mentioned that in average, adolescents with obesity have lower self esteem. Study by Rose et al<sup>17</sup> states that in adolescents with severe obesity, this emotional dysfunction is related to emotional eating and food addiction. Moreover, according to Lindberg et al<sup>18</sup>, obesity in adolescents could cause the risk of depression and anxiety.

Quality of life domain that got disturbed after emotional function was school function. There were 17 children, with proportion of 51,5%. This is supported by study result by Herlina et al<sup>19</sup> in 2013 which stated that academic performance in adolescents with obesity was lower than those ones without obesity. That study used mathematics and English as parameter.

Meanwhile, the biggest proportion of obese children with good quality of life domain could be found in social function domain. There were 25 children, with percentage of 75,8%. This result was supported by Tyler et al<sup>20</sup>, that only severe obesity had correlation with psychosocial function, especially social function.

From the study result, it was obtained that obese group and non obese group had the average score of PedsQL 78,385 and 83,807 respectively with the average gap 5,422. Using t-test analysis, the result is  $p=0,056$ . Value of  $p>0,05$  shows that there is no significant difference between average score of quality of life in children with obesity and children without obesity in SMP Warga, Surakarta city. Thus, the study hypothesis that there is difference between quality of life in obese children and non obese children can't be proven yet statistically.

Based on the quality of life assessment using PedsQL questionnaire 4.0 version that was translated to Indonesian language, it is known that among 33 obese children, there are 18 children with good quality of life (54,5%) and 15 children with poor quality of life (45,5%). Meanwhile,

among 33 non obese children, there are 24 children with good quality of life (72,7%) and 9 children with poor quality of life (27,3%).

### **Study Limitation and Suggestion**

Basically, quality of life in children is not solely affected by obesity status. It is also affected by environment, economic, and other health factor<sup>21</sup>. In health factor, poor quality of life could also be related to several chronic condition such as cancer, hypertension, and diabetes mellitus<sup>22</sup>. Gender factor is not concerned in this study, meanwhile girls tend to give lower estimation than boys in regards of quality of life<sup>23</sup>.

More studies should be done to look for other factors that haven't been observed, that could affect quality of life in children with obesity and without obesity, with bigger sample number and larger research scope, in the hope of making stronger conclusion and minimizing bias.

### **CONCLUSION**

There is no significant difference in quality of life score average between the group of obese and non obese children.

### **ACKNOWLEDGEMENT**

The author would like to thank Hari Wahyu Nugroho, dr., Sp.A, M.Kes and Made Setiamika, dr., Sp.THT-KL (K) who have given guidance and critics for this study. The author also thank the headmaster of SMP Warga Surakarta who has given permission for this study and helped obtain the data.

### **REFERENCES**

1. Fassio O, Rollero C, De Piccoli N. Health, Quality of Life and Population Density: A Preliminary Study on "Contextualized" Quality of Life. *Social Indicators Research*. 2012;110(2):479-488.
2. Ikeda E, Hinckson E, Krägeloh C. Assessment of quality of life in children and youth with autism spectrum disorder: a critical review. *Quality of Life Research*. 2013;23(4):1069-1085.
3. Eddolls W, McNarry M, Lester L, Winn C, Stratton G, Mackintosh K. The association between physical activity, fitness and body mass index on mental well-being and quality of life in adolescents. *Quality of Life Research*. 2018;27(9):2313-2320.
4. Lee C, Lin C, Strong C, Lin Y, Chou Y, Tsai M. Metabolic correlates of health-related quality of life among overweight and obese adolescents. *BMC Pediatrics*. 2018;18(1).
5. Chooi Y, Ding C, Magkos F. The epidemiology of obesity. *Metabolism*. 2019;92:6-10.
6. World Health Organization (WHO). Obesity and overweight. Geneva. 2015.
7. Jaacks LM, Vandevijvere S, Pan A, McGowan CJ, Wallace C, Imamura F, et al. The obesity transition: stages of the global epidemic. *Lancet Diabetes Endocrinol*. 2019;7:231-40.
8. Nuraini A, Murbawani E. Hubungan Antara Ketebalan Lemak Abdominal Dan Kadar Serum High Sensitivity C-Reactive Protein (Hs-Crp) Pada Remaja. *Journal of Nutrition College*. 2019;8(2):81.
9. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. Riset Kesehatan Dasar (RISKESDAS) 2013. Jakarta: Kementerian Kesehatan RI. 2013.
10. Santoso B, Sulistiowati E, Sekartuti, dan Lamid A. Pokok Pokok Hasil Riset Kesehatan Dasar (RISKESDAS) Provinsi Jawa Tengah 2013. Edisi pertama. Jakarta: Lembaga Penerbitan Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. 2013. hlm. 288-297.

11. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. Riset Kesehatan Dasar (RISKESDAS) 2018. Jakarta: Kementerian Kesehatan RI. 2018.
12. Hruby A, Manson J, Qi L, Malik V, Rimm E, Sun Q et al. Determinants and Consequences of Obesity. *American Journal of Public Health*. 2016;106(9):1656-1662.
13. Rankin J, Matthews L, Cobley S, Han A, Sanders R, Wiltshire H et al. Psychological consequences of childhood obesity: psychiatric comorbidity and prevention. *Adolescent Health, Medicine and Therapeutics*. 2016;Volume 7:125-146.
14. Karnik S, Kanekar A. A narrative review of public health policies for childhood obesity prevention in the United States. *Journal of Local and Global Health Science*. 2014;2014(1).
15. Hovsepian S, Qorbani M, Motlagh M, Madady A, Mansourian M, Gorabi A et al. Association of obesity and health related quality of life in Iranian children and adolescents: the Weight Disorders Survey of the CASPIAN-IV study. *Journal of Pediatric Endocrinology and Metabolism*. 2017;30(9).
16. Forste R, Moore E. Adolescent obesity and life satisfaction: Perceptions of self, peers, family, and school. *Economics & Human Biology*. 2012;10(4):385-394.
17. Lindberg L, Hagman E, Danielsson P, Marcus C, Persson M. Anxiety and depression in children and adolescents with obesity: a nationwide study in Sweden. *BMC Medicine*. 2020;18(1).
18. Rose M, Nadler E, Mackey E. Impulse Control in Negative Mood States, Emotional Eating, and Food Addiction are Associated with Lower Quality of Life in Adolescents with Severe Obesity. *Journal of Pediatric Psychology*. 2017;43(4):443-451.
19. Herlina N, Djais JTB, Rusmil K. Obesity and academic performances in adolescents. *Paediatrica Indonesiana* 2013; 53(1): 12-15.
20. Tyler C, Johnston CA, Fullerton G, Foreyt JP. Reduced quality of life in very overweight Mexican–American adolescents. *Journal of Adolescent Health* 2007; 40(4):366–368.
21. Cheng C, Li A. Internet Addiction Prevalence and Quality of (Real) Life: A Meta-Analysis of 31 Nations Across Seven World Regions. *Cyberpsychology, Behavior, and Social Networking*. 2014;17(12):755-760.
22. Lacy KE, Allender SE, Kremer PJ, de Silva-Sanigorski AM, Millar LM, Moodie ML, Mathews LB, dkk. Screen time and physical activity behaviours are associated with health-related quality of life in Australian adolescent. *Quality of Life Research* 2012; 21(6):1085-1099.
23. Buttitta M, Iliescu C, Rousseau A, Guerrien A. Quality of life in overweight and obese children and adolescents: a literature review. *Quality of Life Research*. 2013;23(4):1117-1139.