



Obesity in Indonesian and Taiwanese Adolescents Related to Self Perception, Diet, Exercise, and Body Image

Lukman Fauzi¹, Oktia Woro Kasmini Handayani¹ ✉, Mursid Tri Susilo¹, Arif Rahmat Kurnia², Sri Ratna Rahayu¹, Fajar Awang Irawan¹, Frank Jing-Horng Lu³, Cenyi Lin⁴, Mei Fen Lai⁴, Ya-Chiao Yu⁵

¹Faculty of Sports Science, Universitas Negeri Semarang, Indonesia

²Semarang Health Training Center, Ministry of Health of the Republic of Indonesia, Indonesia

³Graduate Institute of Sports Coaching Science, Chinese Culture University, Taiwan

⁴Graduate Institute of Physical Education, National Taiwan Sport University, Taiwan

⁵Graduate Institute of Health and Sport Science, National Changhua University of Education, Taiwan

Article Info

Article History:

Submitted May 2018

Accepted December 2021

Published January 2022

Keywords:

Self-perception, Body Mass Index, Obesity, Teenagers

DOI

<https://doi.org/10.15294/kemas.v17i3.34396>

Abstract

Obesity prevalence in Asia was raising. Self-perception became an increasingly determinant predictor of a healthier lifestyle. The purpose of this study was to investigate the relationship between self-perception and actual BMI among Indonesian and Taiwanese teenagers. This research was cross sectional and using participatory sampling of 415 participants from 6 high schools in Indonesia, and 717 participants from 7 high schools in Taiwan. The data was taken by enumerator using the Obesity Impact on the Quality of Life Perception Questionnaire (ObI-Q) and the Projective Test. Self-perception was statistically associated with actual BMI which state that obesity might be treated by hospital, clinics, or specialist ($p < 0.001$). Self-perception was also related to degenerative disease ($p = 0.003$) and social life ($p = 0.04$). Self-perception about sports stated that obese people could be as good as normal people ($p = 0.11$). Most teenagers had the correct perception regarding ideal body image ($p = 0.04$). The multivariable analysis showed that teenagers who did not have self-perception of desire to lose weight were 6.37 times more likely to have overweight than teenagers who had self-perception of desire to lose weight. Self-perception of desire to lose weight was a variable with major contribution to actual BMI among teenagers.

Introduction

Obesity is a nutrition-related disease with the highest prevalence globally. This condition impacts medical, psychological, social and economic problems faced by countries in the upcoming years (Cena et al., 2017; Khan et al., 2020). Obesity could began from the childhood period due to more consumption of high energy, sweet and fat contained meals compared to fiber and nutrition-rich food like fruits and vegetables (Xu & Xue, 2016). The typical problem occurs on obese teenagers were stress because of unsatisfied feeling about their body shape. This perception leads to the lost motivation thus making the weight reduction

program difficult (Kimber et al., 2015).

Adult obesity was not only related to genetic factors, but also related to their environment on the developmental stages. There was strong influence of child genetic on the adult Body Mass Index (BMI), especially by variations in the LEPR/LEPROT locus. These findings suggest that different genetic factors influence the BMI of infants and children. In light of the obesity epidemic, the findings are important to inform the time and target of the prevention strategy (Alves et al., 2019). Additional pediatric obesity locus was found by a trans-ancestor meta-analysis of the 13,005 cases and 15,599 control from Europe, Africa,

✉ Correspondence Address:
Faculty of Sports Science, Universitas Negeri Semarang, Indonesia.
Email : oktia2016@mail.unnes.ac.id

America, and East Asian ancestors (Bradfield et al., 2019).

Obesity prevalence on the people ages above 18 years old in Indonesia was steadily increasing. Data from Indonesian Basic Health Research (RISKESDAS) 2007, 2013 and 2018 the prevalences obesity ($IMT \geq 27$) consecutively were 10.5%; 14.8%; 21.8% (Balitbangkes, 2018). These numbers came along with the increase of central obesity prevalence on community aging ≥ 15 years old in those years were 18,8%; 26,6%; 31,0% (Balitbangkes, 2018). The proportion of poor physical activity (exercise less than 150 minutes per week) on Indonesian population aging > 10 years was increased from 26,1% in 2013 to 33,5% in 2018 (Balitbangkes, 2018). Obesity prevalence in Indonesia was higher in the urban areas (38,3%) compared to rural areas (28,2%) (Balitbangkes, 2018). This condition certainly is worrying due to obesity is the risk factors for diabetes, stroke, cancer, and some other degenerative disease.

Taiwan was close to Indonesia in terms of economy, social, and culture. There were many Indonesian lived in Taiwan, mostly as students and migrant workers. This condition created shared culture between two countries. Malnutrition was one of the shared problems in both countries. In Taiwan, the prevalence of overweight relatively stabilized, but the prevalence of morbid obesity and obesity increased sharply from 0,4% and 11,8% in 1993-1996 to 1,4% and 22% in 2013-2014 (Chang et al., 2017). The increasing prevalence mainly caused by low physical activity, decreased leisure sit time, and decreased sleep time. The problem is made worse by the low health literacy among school children and the high consumption of sugar-sweetened beverages (Lin et al., 2016). Fortunately, obese children in Taiwan are harboring some unique characteristics, they tend to have less disruptive behavior, have a lower prevalence of anxiety, and more unlikely to fall into depression (Puhl et al., 2013). The difference in self-perception of their own body were related to their respective cultures (Chiu et al., 2017; Handayani et al., 2020).

The community awareness regarding the risk of obesity was still low. People saw obesity as a negative trait, often showed by continuously shaming obese persons of their

own body. Increasing stigma to the obese person causing them to avoid any conversation of fat and physical activity (Webb et al., 2016). This condition particularly occurs in high school teenagers or those who just enter the college. This problem requires specific approaches, particularly related to the perception of health promotion target thus the community can accept and implement communicated messages (Redline et al., 1999). This research provided analysis of self-perception and actual body weight among Indonesian and Taiwanese teenagers.

Method

This study focused on understanding self-perceptions and actual weight teenagers in both Indonesia and Taiwan. This research was conducted using a quantitative approach with a cross-sectional design. The study was conducted after the proposal received ethical proof of ethics commissions in each country. The respondents were from 6 high schools in Indonesia and 7 high schools in Taiwan. The sampling technique used in this research was purposive sampling at the schools which meet three criterias. These criterias were: located in urban areas, public school with excellent accreditation, and agree to participate in the research. Students sit in the 11th grade were then asked for their consent to volunteered as respondents for the research. This consideration was taken to prevent our research from obstructing teaching and learning process. The reason behind the three criterias was for having similar school quality between Indonesia and Taiwan. Totally, there were 415 participants in Indonesia and 717 participants in Taiwan completed all survey package.

We adapt the questionnaire of the Obesity Impact on the Quality of Life Perception Questionnaire (ObI-Q), and the Projective Test (Hochdorn et al., 2014; Rendón-Macías et al., 2014; Zaman, 2015). The ObI-Q and the Projective Test were adapted as it is. In both countries, researcher employ translator and enumerator to help students in understanding the questions. Data analysis used a quantitative approach using the chi-square test for bivariate analysis and the logistic regression for multivariate analysis.

Results and Discussion

Data regarding self-perception and BMI were available from 1,138 teenagers. Among them, a total of 415 teenagers were from Indonesia, whereas 723 teenagers were from Taiwan. Descriptive characteristics of the teenagers are reported in Table 1. The mean age was 15.79 (± 1.48) years old, and there was a significant difference in means between Indonesian and Taiwanese teenagers ($p < 0.001$). Fifty four percent of the teenagers were males, and 149 of them were from Indonesia (24.39%). When compared to male teenagers between 2 countries, there was a statistical difference between groups ($p < 0.001$).

BMI was analyzed as a numeric variable from body weight (kg) and height (m). The

mean of BMI was 21.07 (+ 4.11) kg/m² and there was no significant difference of BMI between Indonesian and Taiwanese teenagers ($p = 0.77$). If categorized, underweight teenagers were found in 17% participants. Among them, 57,2% of them were from Indonesia and 42,7% were from Taiwan. Normal BMI were found in 59.1% teenagers. Among them, 35.6% of them were from Indonesia and 64.4% were from Taiwan. However, there were more overweight teenagers from Taiwan (86.4%) than from Indonesia (13.6%). Likewise, in obese teenagers, there were more obese teenagers from Taiwan (61.2%) than from Indonesia (38.2%). When compared to 4 categories of BMI between 2 countries, there was a statistical difference between groups ($p < 0.001$).

Table 1. Description statistics of participants

Characteristics	All	Indonesia	Taiwan	P value
Age (year), mean (SD)	15.79 (1.48)	16.12 (0.79)	15.59 (1.73)	<0.001*
Sex				
Male, n (%)	611 (53.7%)	149 (36.1%)	462 (63.7%)	<0.001*
Female, n (%)	527 (46.3%)	264 (63.9%)	263 (36.3%)	
BMI (kg/m ²), mean (SD)	21.07 (4.11)	21.12 (3.97)	21.04 (4.19)	0.77
BMI category				
Underweight, n (%)	194 (17%)	111 (26.9%)	83 (11.4%)	<0.001*
Normal, n (%)	672 (59.1%)	239 (57.9%)	433 (59.7%)	
Overweight, n (%)	169 (14.9%)	23 (5.6%)	146 (20.1%)	
Obesity, n (%)	103 (9.1%)	40 (9.7%)	63 (8.7%)	

* P value < 0.05 is considered significant.

Source: Primer Data, 2020

Table 2. Self-Perception and Actual Weight (BMI Category) in Indonesian dan Taiwanese Teenagers

Self-Perception	Overweight	Non-overweight	All	P value
Desire to lose weight				
No, n (%)	27 (5.1)	503 (94.9)	530 (100)	<0.001*
Yes, n (%)	174 (28.6)	434 (71.4)	608 (100)	
Reason to lose weight				
For appearance				
No, n (%)	83 (13.3)	540 (86.7)	623 (100)	<0.001*
Yes, n (%)	118 (22.9)	397 (77.1)	515 (100)	
For better health, n (%)				
No, n (%)	63 (10.2)	553 (89.8)	616 (100)	<0.001*
Yes, n (%)	138 (26.4)	384 (73.6)	522 (100)	
For better well-being, n (%)				
No, n (%)	150 (16.4)	765 (83.6)	915 (100)	0.02

Yes, n (%)	51 (22.9)	172 (77.1)	223 (100)	
To get in shape, n (%)				
No, n (%)	119 (17.1)	575 (82.9)	694 (100)	0.57
Yes, n (%)	82 (18.5)	362 (81.5)	444 (100)	
To fit the clothes, n (%)				
No, n (%)	154 (15.5)	841 (84.5)	995 (100)	<0.001*
Yes, n (%)	47 (32.9)	96 (67.1)	143 (100)	
The role of genetics in obesity				
Not important at all, n (%)	35 (23.8)	112 (76.2)	147 (100)	0.20
Somewhat important, n (%)	39 (15.8)	208 (84.2)	247 (100)	
Important, n (%)	70 (17)	342 (83)	412 (100)	
Very important, n (%)	57 (17.2)	275 (82.8)	332 (100)	
Diet and exercise might induce weight loss				
No, n (%)	47 (22.2)	165 (77.8)	212 (100)	0.05
Yes, n (%)	154 (16.6)	772 (83.4)	926 (100)	
Obesity might be treated by				
Hospital, clinics, or specialists, n (%)				
No, n (%)	142 (21)	535 (79)	677 (100)	<0.001*
Yes, n (%)	59 (12.8)	402 (87.2)	461 (100)	
General practitioners, n (%)				
No, n (%)	151 (18.7)	655 (81.3)	806 (100)	0.14
Yes, n (%)	50 (15.1)	282 (84.9)	332 (100)	
Dietitians/ nutritionists, n (%)				
No, n (%)	97 (18.8)	418 (81.2)	515 (100)	0.35
Yes, n (%)	104 (16.7)	519 (83.3)	623 (100)	
Social workers, n (%)				
No, n (%)	191 (17.9)	877 (82.1)	1068 (100)	0.44
Yes, n (%)	10 (14.3)	60 (85.7)	70 (100)	
Individual efforts to eat a healthy diet and do physical activity, n (%)				
No, n (%)	30 (19.5)	124 (80.5)	154 (100)	0.53
Yes, n (%)	171 (17.4)	813 (82.6)	984 (100)	
Bariatric surgery, n (%)				
No, n (%)	183 (17.9)	838 (82.1)	1021 (100)	0.50
Yes, n (%)	18 (15.4)	99 (84.6)	117 (100)	
Prescribed drugs, n (%)				
No, n (%)	191 (17.9)	878 (82.1)	1066 (100)	0.39
Yes, n (%)	10 (13.9)	62 (86.1)	72 (100)	
Obesity is related to degenerative disease				
No, n (%)	68 (23.4)	233 (76.6)	291 (100)	0.003*
Yes, n (%)	133 (15.7)	714 (84.3)	847 (100)	

Obesity is related to life expectancy				
No, n (%)	79 (18.8)	342 (81.2)	421 (100)	0.46
Yes, n (%)	122 (17)	595 (83)	717 (100)	
Obesity affects mental condition				
No, n (%)	145 (19.1)	615 (80.9)	760 (100)	0.08
Yes, n (%)	56 (14.8)	322 (85.2)	378 (100)	
Obesity affects social life				
No, n (%)	142 (19.4)	591 (80.6)	733 (100)	0.04*
Yes, n (%)	59 (14.6)	346 (85.4)	405 (100)	
In sports, obese people				
Be as good as anyone can be, n (%)	101 (19.6)	413 (80.4)	514 (100)	0.11
Never be good at any sports, n (%)	100 (16)	524 (84)	624 (100)	
Ideal body image				
Incorrect, n (%)	32 (13.1)	212 (86.9)	244 (100)	0.04*
Correct, n (%)	169 (18.9)	725 (81.1)	894 (100)	

* *P* value <0.05 is considered significant.

The association between self-perception and BMI among 2 countries was reported in Table 2. Out of 21 self-perception variables assessed, the bivariate analysis found 10 self-perceptions associated with BMI ($p < 0.05$): self-perception of desire to lose weight, reason to lose weight for appearance, reason to lose weight for better health, reason to lose weight for better well-being, reason to lose weight to fit the clothes, obesity might be treated by hospital, clinics, and specialist, obesity is related to degenerative disease, obesity affects mental condition, and ideal body image.

From 201 overweight teenagers, the proportion was more common in teenagers who had self-perception of desire to lose weight (86.7%) than those who did not have self-perception of desire to lose weight (15.5%). Current study also found that the proportion of overweight teenagers was higher among teenagers who had reason to lose weight for appearance (58.7%) and for better health (68.7%) compared to those who did not have reason for appearance (41,3%) and for better health (31,3%). However, teenagers who did not have reason to lose weight for better well-being, to get in shape, and to fit the clothes were more common in overweight teenagers. Seventy percent of overweight teenagers assumed that the role of genetics in obesity is important than

other assumption, however, this difference was not statistically significant ($p = 0.20$).

When compared with overweight teenagers, non-overweight teenagers had more self-perception that diet and exercise might induce weight loss (83.4%) than overweight teenagers (16.6%). Regarding the management of obesity, the perception that obesity might be treated was mostly owned by non-overweight teenagers than those who were overweight, treated by hospital, clinics, or specialists (87.2%), by general practitioners (84.9%), dietitians/ nutritionists (83.3%), social workers (85.7%), individual efforts (82.6%), bariatric surgery (84.6%), and prescribed drugs (86.1%). Of the 7 self-perceptions related to obesity management, the variable statistically associated was only obesity might be treated by hospital, clinics, or specialist ($p < 0.001$).

Other perceptions also showed that non-overweight teenagers had more self-perception that obesity is related to degenerative disease (84.3%), obesity is related to life expectancy (83%), obesity affects mental condition (85.2%), and obesity affects social life (85.4%) compared to those who were overweight. However, the variables statistically associated were self-perception of obesity is related to degenerative disease ($p = 0.003$) and obesity affects social life ($p = 0.04$). Self-perception that in sports,

obese people could be as good as normal people showed there was no significant difference, both in teenagers who were overweight and not overweight ($p=0.11$). Most teenagers who were

overweight and not overweight had the correct perception regarding ideal body image and it was statistically significant ($p=0.04$).

Table 3. Multivariable Logistic Analysis of Actual BMI based on Self-Perception

Self-Perception	Category	OR (95% CI)	P value
Desire to lose weight	No	6.37 (4.1-9.9)	<0.001*
	Yes		
Reason to lose weight for better health	No	2.26 (1.59-3.21)	<0.001*
	Yes		
Diet and exercise might induce weight loss	No	1.67 (1.11-2.5)	0.01*
	Yes		
Obesity might be treated by hospital, clinics, or specialists	No	1.84 (1.29-2.63)	0.001*
	Yes		
Obesity is related to degenerative disease	No	1.57 (1.09-2.25)	0.01*
	Yes		

* P value <0.05 is considered significant.

The multivariable logistic analysis is shown in Table 3. From 10 self-perceptions associated with BMI in bivariate analysis, the multivariable analysis found 5 associated self-perceptions: desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight lose, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease.

From this result, investigators concluded that self-perception of desire to lose weight was a variable with major contribution to actual BMI among teenagers. Teenagers who did not have self-perception of desire to lose weight were 6.37 times more likely to have overweight than teenagers who had self-perception of desire to lose weight.

This research was trying to explore the relationship between self-perception and actual BMI of teenagers in Indonesia and Taiwan. The data was collected from 1,138 11th graders spreading across 13 different schools in Indonesia and Taiwan. The average respondents age was 15.79 (± 1.48) years old. There were 53.7% male teenagers and 527 female teenagers with average BMI of 21.07.

Bivariate analysis showed that there was significant difference between categories of BMI in Indonesia and Taiwan ($p<0.001$), but no different in numeric BMI. In Indonesia, most

of teenagers were underweight and normal. On the other hand, most teenagers in Taiwan were normal and overweight. The questionnaires containing 21 self-perception variables, in which 10 self-perceptions associated with BMI ($p<0.05$): self-perception of desire to lose weight, reason to lose weight for appearance, reason to lose weight for better health, reason to lose weight for better well-being, reason to lose weight to fit the clothes, obesity might be treated by hospital, clinics, and specialist, obesity is related to degenerative disease, obesity affects mental condition, and ideal body image. The 10 self-perceptions then analyzed by using logistic regression. It has 5 associated self-perceptions: desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight lose, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease. The desire to lose weight was a variable with major contribution to actual BMI among teenagers, if teenagers did not have self-perception of desire to lose weight, they will be 6.37 times more likely to be overweight.

Result of this research is consistent with the results of another study proving that eating behavior and physical activity are thought to be the main triggers of the high prevalence of teenagers obese teenagers (Mahdiah et al.,

2004). Another study showed that obesity and stress could trigger hypertension (Korneliani & Meida, 2012). The results of data analysis showed that there was a relationship between central obesity with total blood cholesterol levels (Listiyana et al., 2013). In addition, environment factors such negative social support and stigma received resulted in psychological impact and less interactions (Muharry & Kumalasari, 2018). The study of the Gene-Environment Interaction (GEI) has shown that heritability had an impact on both monogenic and polygenic obesity. It provided convergent evidence wherein obesity-predisposition genes interact with various environments, lifestyle and exposure treatment (Reddon et al., 2016). Interventions with lifestyle approaches consisted of the promotion of healthy lifestyles, nutritional counseling, physical training, and behavioral change improved weight loss and reduced risk factors for cardiovascular disease (Galani & Schneider, 2007; Kurnia et al., 2018).

This research had different approach in understanding the nature of body weight and BMI. This uniqueness made it possible to conclude that self-perception played an important role in the actual BMI. Those with good self-perception of their own weight will be less likely to be overweight or obese. Differences in race, ethnicity, and tradition will result in differences in health treatment and health care which will shape different perception (Horowitz et al., 2000). This study combined data of Taiwanese and Indonesian teenagers, which showed that the shared culture shaped nearly similar self-perception. Correct perception of obesity will help teenagers to lose their weight (Yang et al., 2014).

Obese people tend to watch more television and rarely have a physical activity or in other words have a sedentary lifestyle (Cameron et al., 2003). The habits of Indonesian teenagers who watch shows on TV during their free time and idolize popular artists who influence perceptions related to obesity and activity. In line with the results of research which states that various online media such as advertisements and public figures provide the dogma that the ideal body is slim and thin so that it can influence people's perceptions about obesity (Faccio, 2013). Good community

perceptions about ideal body shape will motivate teenagers to reach a better body goal (Hesketh et al., 2005). The limitation of this research was there were no observations done in rural environments. This made the result of this research limited only to urban teenagers.

Conclusion

There were no significant differences in BMI between Indonesian and Taiwanese teenagers, but there was a significant difference in BMI categories. Most Indonesian teenagers were categorized as underweight and normal, where as Taiwanese teenagers categorized as overweight and normal. The desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight lose, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease were significant perceptions affecting the actual BMI. Teenagers with no self-perception to lose weight will be more likely to developed overweight than their counterparts. It is important to include the rural areas for the future research.

Acknowledgement

This study was funded by the "Hibah Dana DIPA PNBPFakultas Ilmu Keolahragaan" grant from Faculty of Sports Science, Universitas Negeri Semarang, Indonesia.

References

- Alves, A.C., Silva, N.M.G.D., Karhunen, V., Sovio, U., Das, S., Taal, H.R., Warrington, N.M., Lewin, A.M., Kaakinen, M., Cousminer, D.L., & Thiering, E., 2019. GWAS on Longitudinal Growth Traits Reveals Different Genetic Factors Influencing Infant, Child, and Adult BMI. *Sci Adv*, 5(9), pp.1–18.
- Balitbangkes., 2018. *Hasil Utama Riskesdas 2018*. <https://www.litbang.kemkes.go.id/hasil-utama-riskesdas-2018/>.
- Bradfield, J.P., Vogelesang, S., Felix, J.F., Chesi, A., Helgeland, O., Horikoshi, M., Karhunen, V., & Lowry, E., 2019. A Trans-Ancestral Meta-Analysis Of Genome-Wide Association Studies Reveals Loci Associated With Childhood Obesity. *Hum Mol Genet*, 28(19), pp.3327–3338.
- Cameron, A.J., Welborn, T.A., Zimmet, P.Z., Dunstan, D.W., Owen, N., Salmon, J., Dalton,

- M., Jolley, D., & Shaw, J.E., 2003. Overweight and Obesity in Australia: the 1999-2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab). *Med J Aus*, 178(9), pp.427-432.
- Cena, H., Stanford, F.C., Ochner, L., Fonte, M.L., Biino, G., Giuseppe, R. de, Taveras, E., Misraf, M., Cena, H., Stanford, F.C., & Ochner, L., 2017. Association Of A History Of Childhood-Onset Obesity And Dieting With Eating Disorders. *Eat Disord*, 25(3), pp.216-229.
- Chang, H.-C., Yang, H.-C., Chang, H.-Y., Yeh, C.-J., Chen, H.-H., Huang, K.-C., & Pan, W.-H., 2017. Morbid Obesity In Taiwan: Prevalence, Trends, Associated Social Demographics, And Lifestyle Factors. *Plos One*, 12(2), pp.1-13.
- Chiu, C.-H., Ko, M.-C., Wu, L.-S., Yeh, D.-P., Kan, N.-W., Lee, P.-F., Hsieh, J.-W., Tseng, C.-Y., & Ho, C.-C., 2017. Benefits Of Different Intensity Of Aerobic Exercise In Modulating Body Composition Among Obese Young Adults: A Pilot Randomized Controlled Trial. *Health Qual Life Outcome*, 13(1), pp.1-9.
- Faccio, E., 2013. *The Corporeal Identity: When the Self-image Hurts*. The Springer.
- Galani, C., & Schneider, H., 2007. Prevention And Treatment Of Obesity With Lifestyle Interventions: Review And Meta-Analysis. *Int J Public Health*, 52(6), pp.348-359.
- Handayani, O.W.K., Nugroho, E., & Hermawati, B., 2020. Determinant of Diabetes Mellitus Focusing on Differences of Indonesian Culture: Case Studies in the Java and Outer Java Region in Indonesia. *Open Public Health J*, 13(1), pp.323-340.
- Hesketh, K., Waters, E., Green, J., Salmon, L., & Williams, J., 2005. Healthy Eating, Activity and Obesity Prevention: a Qualitative Study of Parent and Child Perceptions in Australia. *Health Promot Int*, 20(1), pp.19-26.
- Hochdorn, A., Baldi, I., Paramesh, E.C., Kumar, M., Gulati, A., & Gregori, D., 2014. Is My Kid Out Of Size? Indian Mothers' Desirability Bias In Evaluation Of Their Children's Weight. *Indian J Pediatr*, 81(S1), pp.39-46.
- Horowitz, C.R., Davis, M.H., Palermo, A.G., & Vladeck, B.C., 2000. Approaches to Eliminating Sociocultural Disparities in Health. *Health Care Financ Rev*, 21(4), pp.57-74.
- Khan, M.D.S., Halder, H.R., Rashid, M., Afroja, S., & Islam, M., 2020. Impact Of Socioeconomic And Demographic Factors For Underweight And Overweight Children In Bangladesh: A Polytomous Logistic Regression Model. *Clin Epidemiol Glob Heal*, 8(4), pp.1348-1355.
- Kimber, M., Georgiades, K., Couturier, J., Jack, S.M., & Wahoush, O., 2015. Adolescent Body Image Distortion: A Consideration of Immigrant Generational Status, Immigrant Concentration, Sex and Body Dissatisfaction. *J Youth Adolesc*, 44(11), pp.2154-2171.
- Korneliani, K., & Meida, D., 2012. Obesitas dan Stress Dengan Kejadian Hipertensi. *Jurnal Kesehatan Masyarakat*, 7(2), pp.117-121.
- Kurnia, A.R., Susilo, M.T., & Mardiana, M., 2018. Developing Balanced Nutrition Snakes and Ladders as Educational Media for Balanced Nutrition Tumpeng on Elementary School Student. *J Dunia Gizi*, 1(2), pp.65-70.
- Lin, P.Y., Lin, F.Y., Chen, T.C., Chen, W.L., Doong, J.Y., Shikanai, S., Sarukura, N., & Yamamoto, S., 2016. Relationship between Sugar Intake and Obesity among School-Age Children in Kaohsiung, Taiwan. *J Nutr Sci Vitaminol*, 62(5), pp.310-316.
- Listiyana, A.D., Mardiana, & Prameswari, G.N., 2013. Obesitas Sentral dan Kadar Kolesterol Darah Total. *KESMAS - Jurnal Kesehatan Masyarakat*, 9(1), pp.37-43.
- Mahdiah, M., Hadi, H., & Susetyowati, S., 2004. Prevalensi Obesitas dan Hubungan Konsumsi Fast Food dengan Kejadian Obesitas pada Remaja SLTP Kota dan Desa di Daerah Istimewa Yogyakarta. *J Gizi Klin Indones*, 1(2), pp.69-77.
- Muharry, A., & Kumalasari, I., 2018. Social Epidemiology Analysis of Overweight in Toodler at Sukagumiwang Public Health Center Indramayu District. *Jurnal Kesehatan Masyarakat*, 14(2), pp.264-271.
- Puhl, R., Peterson, J.L., & Luedicke, J., 2013. Fighting Obesity Or Obese Persons? Public Perceptions Of Obesity-Related Health Messages. *Int J Obes*, 37(6), pp.774-782.
- Reddon, H., Guéant, J.-L., & Meyre, D., 2016. The Importance Of Gene-Environment Interactions In Human Obesity. *Clin Neurosci Res*, 130(18), pp.1571-1597.
- Redline, S., Tishler, P.V., Schluchter, M., Aylor, J., Clark, K., & Graham, G., 1999. Risk Factors For Sleep-Disordered Breathing In Children: Associations With Obesity, Race, And Respiratory Problems. *Am J Respir Crit Care Med*, 159(5), pp.1527-1532.
- Rendón-Macias, M.-E., Rosas-Vargas, H., Villasis-Keever, M.-Á., & Pérez-García, C., 2014. Children's Perception On Obesity And Quality Of Life: A Mexican Survey. *BMC Pediatr*, 14(1), pp.1-8.

- Webb, J.B., Fiery, M.F., & Jafari, N., 2016. "You Better Not Leave Me Shaming!": Conditional Indirect Effect Analyses Of Anti-Fat Attitudes , Body Shame , And Fat Talk As A Function Of Self-Compassion In College Women. *Body Image*, 18, pp.5–13.
- Xu, S., & Xue, Y., 2016. Pediatric obesity: Causes, Symptoms, Prevention and Treatment. *Exp Ther Med*, 11(1), pp.15–20.
- Yang, K., Turk, M.T., Allison, V.L., James, K.A., & Chasens, E., 2014. Body Mass Index Self-Perception And Weight Management Behaviors During Late Adolescence. *J Sch Health*, 84(10), pp.654–660.
- Zaman, G.S., 2015. Influence Of Lifestyle Patterns On Perceptions Of Obesity And Overweight Among Expatriates In Abha City Of Kingdom Of Saudi Arabia. *J Nat Sci Biol Med*, 6(2), pp.329–334.