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MANAGEMENT OF WALKING PHYSICAL ACTIVITY IN ADOLESCENTS WITH OBESITY IN RT 07 RW 016 SRENGSENG SAWAH, JAGAKARSA, SOUTH JAKARTA

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ABSTRACT

Introduction: Obesity is one of the health problems that must be handled properly because it can affect individuals of all ages, from children to adults. Obesity occurs in school-age children because it can interfere with the health and body image of the child. Some interventions are believed to help lose weight in school-age children who are obese. Self Hypnosis therapy is one intervention that has been proven to be able to lose weight.The application of nursing care aims to determine the effectiveness of Self Hypnosis therapy on weight loss in school-age children who are obese.

Method: Obesity is one of the most common nutritional health problems in children and adolescents. Obesity is a serious problem and requires immediate treatment to avoid complications and adverse effects on the future of children and adolescents, both in terms of physical health and on the child's body image. In addition to diet, physical activity plays an important role in reducing the incidence of obesity. Physical activity walking is one form of obesity management that has been proven to reduce weight. This writing aims to perform the management of physical activity walking on weight loss in adolescents with obesity.

Results: This intervention was given for 12 times to two teenagers in the Srengseng Sawah area, Jagakarsa, South Jakarta who had the criteria for obesity results with a BMI more than the 95th percentile. The results of the implementation for 4 weeks showed that there was a weight loss of 3.1kg for the first client and 2kg for the second client after the intervention of walking physical activity, so it can be concluded that the intervention of walking physical activity has an effect on weight loss in adolescents with obesity.

Conclusion: Community nurses are expected to apply walking physical activity interventions as one of the interventions in overcoming obesity in adolescents.

Keywords: *Adolescents, Obesity, Walking*

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INTRODUCTION

Obesity is a health problem that often appears in patients from young to adulthood. Obesity is a condition that shows a person's weight shows a number more than the normal body mass index (BMI) according to age. Initially, overweight problems will be found and continue with obesity problems, this incident is explained in the Global Burden of Disease/GBD data 2017,

which explains obesity as the fifth highest risk factor for death, which is 4.72 million deaths (Dai et al., 2020). Obesity has a risk of complications in the form of chronic diseases such as heart disease, diabetes to a high risk of cancer (Kemenkes RI, 2018).

The Centers for Disease Control and Prevention (CDC) states that the prevalence of obesity is very high in the United States. In children aged 2 to 5 years, obesity rates reach 13.4%, ages 6 to 11 years reach 20.3%, and ages 12 to 19 years reach 21.2% (CDC, 2021). In Indonesia, there is an increase in the percentage of adolescents who are obese, as evidenced in Riskesdas data in 2018 where there was an increase in the percentage from 26.6% initially, now increasing to 31.0% the percentage of adolescents suffering from obesity. Obesity is also a contributor to a fairly large percentage that causes diabetes mellitus for adolescents and allows the incidence of obesity in adulthood which will become a problem in glucose metabolism and in degenerative diseases such as problems with the heart and blood vessel health (Sembiring et al., 2022). The risk of developing problems with the heart and blood flow increases as the obese adolescent grows up (McPhee et al., 2020).

The incidence of obesity in adolescents can be seen as a stressor that occurs due to changes in appearance and body structure that are not ideal and cause disturbances in adolescent body image. A teenager's mental health is also related to his satisfaction with his weight and appearance. Dissatisfaction with body shape will lead to self-confidence and depressive symptoms in obese adolescents (Sagar & Gupta, 2018). Study of Lestari et al (2021), get the results that the incidence of obesity in adolescents is considered very serious, because it can affect the success of adolescents in self-acceptance both for themselves and in the social environment.

In an effort to avoid and overcome obesity in adolescents, physical activity management, regulation of healthy and appropriate food intake and parental supervision can be carried out. It is said that low physical activity in adolescents has a three times greater risk of obesity compared to adolescents who have a habit of doing physical activity in their daily lives (Telisa et al., 2020). The importance of physical activity makes it a target for teenagers to be able to carry out physical activities on a daily basis, even if only with simple physical activities that can be easily done and have minimal contraindications. Physical activity walking is a simple physical activity that can be done in daily life, can be done at any time with individual portions and limits, beneficial for physical and mental health and regardless of age, technique and has a very small risk of injury (Son et al., 2017).

Applying the physical activity of walking in daily life increases the decrease in BMI of obese adolescents and the habit of infrequent movement in adolescents themselves (Darmawati et al., 2020). Study of Hamila et al (2017) concluded that physical activity walking is an effective strategy in making positive changes in body composition, heart rate variability and aerobic fitness in obese adolescents. When aerobic fitness increases, the fat content in the adolescent's body will decrease which is indicated by weight loss, decreased abdominal circumference and increased body fitness (Silva et al., 2020). This physical activity if done regularly is beneficial in increasing exercise tolerance, decreasing body mass (BMI) and decreasing triglyceride and total cholesterol levels (Kucio et al., 2017).

In Japan, physical activity walking is promoted in school-age children by walking to school for students with a radius of 2 to 4 kilometers and has been proven to be able to overcome obesity in children and also be able to increase the level of physical fitness of children (Mori et al., 2012). Complaints of adolescents with obesity in the form of tiredness, shortness of breath and fast heart rate during activities were also denied after managing regular walking activities (Khairunnisa & Dermawan, 2021).

Observations were made in the area of RT 07 RW 016, Srengseng Sawah, Jagakarsa, South Jakarta. The results showed that there were several teenagers in the age range of 10-19 years who suffered from obesity problems. As many as 40% of adolescents said they had never gone on a diet and as many as 70% of adolescents admitted that they had never done physical

activity regularly for reasons of laziness and lack of interest because they get tired easily when exercising. Everyday teenagers use motorized vehicles in carrying out their activities. Physical activity on foot can be used as a solution to the problem of inactive adolescents because it can be easily done, does not require a fee and can be done at any time according to the leeway of the teenager's own time. Based on this phenomenon and the results of previous studies, researchers are interested in discussing research related to the management of physical activity walking in adolescents with obesity health problems.

METHOD

The research design used a descriptive case study. The research instruments used were SOPs for physical activity on foot, assessment sheets, and activity monitoring cards.

The data that has been found during the assessment are grouped and analyzed based on the type of data, namely subjective data and objective data, so that several nursing diagnoses are produced, and then a nursing plan or nursing intervention is carried out. Furthermore, the interventions that have been made will be implemented and evaluated for managed patients and resumed patients. The innovation intervention of walking physical activity was carried out for 4 weeks with 12 meetings with a duration of ± 50 minutes. Researchers will also continue to monitor the patient's body condition before, during and after physical activity in the form of measuring the child's weight before and after doing physical activity, walking, pulse and reviewing the complaints felt during the intervention.

RESULTS

The nursing problems found from the assessment data that have been scoring problems in Mr. W's family are obesity problems in Mr. W's family, especially An.A in managed patients and obesity problems in Mr. S's family, especially An.C in resume patients. The general goal of the main intervention is obesity can be overcome characterized by weight loss and improvement of body mass index (BMI) (PPNI, 2018).

The innovation intervention was given to adolescent patients with obesity in RT 07 RW 016, Srengseng Sawah Village, Jagakarsa District, South Jakarta. The number of patients in this study were two adolescents with 1 patient managed and 1 patient resume, namely An.A and An.C. Management carried out in the form of providing health education about obesity and physical activity walking.

Providing health education about obesity includes understanding obesity, causes and signs of obesity, knowing how to assess a child's BMI, the impact and complications of obesity, and obesity management. The expected evaluation in providing this intervention is in the form of patients being able to say they understand in the material presented, patients being able to re-explain the material on understanding obesity, causes and signs of obesity, assessing obesity based on a child's BMI, and explaining the impact and complications of obesity on health.

The intervention given next is the management of physical activity on foot which is carried out for each teenager. This walking physical activity intervention begins with providing information related to the management in the form of understanding, benefits and objectives, procedures and expected results. This treatment does not require much attention from adolescents, so that teenagers who have a habit of infrequent movement can easily do it. Walking is one form of exercise that is easy, safe, cheap and fun. Performed by moving forward and stepping without breaking with the ground because each step must touch the ground before the back foot is lifted or every one step there will be one foot on the ground, the position of the foot is upright and the supporting foot is in an upright and vertical position (Sumaryoto & Nopembri, 2017).

Prior to the nursing intervention, the authors conducted an assessment in the form of body weight measurements. The results of weight measurements An.A weighed 92.1 kg with BMI reaching the 98th percentile and An.C weighing 86 kg kg with BMI reaching the 99th percentile. Body weight was measured using a digital scale for body weight. In one session of walking physical activity, body weight was

measured twice, namely before and after walking physical activity.

The stages of doing physical activity walking begins with a warm-up movement and ends with a cool-down movement, not just regular walking (Gichara, 2019). Adolescents be given information related to several techniques in carrying out physical activities on foot, starting from good posture in carrying out physical activities on foot and what preparations are considered in order to support the success of the goal and reduce the risk of injury (Haryono & Prastowo, 2020).

Basically, this physical activity of walking can be done by anyone and at any time. It would be better for teenagers to choose certain times to carry out this intervention, such as in the afternoon or other times that support comfort in carrying out physical activities on foot. The intervention was carried out on An.A and An.C, 3 times a week for 4 weeks, so that the total implementation carried out by each teenager was 12 meetings of physical activity on foot with a duration of ± 50 minutes per meeting. Acceleration when doing physical activity walking is equivalent to 100 steps per minute or 4-5km/hour which is attempted to be useful in losing weight (Kemenkes, 2017).

Increased physical activity which was originally exercised only once a week to three times a week with low intensity resulted in weight loss, body fat percentage and blood cholesterol levels due to an increase in energy sources derived from burning body fat reserves. The same is the case with the time the author has done with An. A and An. C, namely for 12 meetings, which initially lacked physical activity, so, during the intervention there was an increase in physical activity in children.

Study of Silva et al (2020), states that weight loss in obese individuals will decrease after doing physical activity walking regularly, because excess calories will be wasted and burned with an increase in metabolic rate when doing physical activity walking. The muscles and strength of the lower extremities of each client also felt better than before, complaints of back and waist pain also decreased.

Table 1 shows the distribution of the evaluation of the walking physical activity intervention in managed patients and resumed patients.

Table 1. Weight gain in Managed Patients and Resume

An.A (Patient Management)												
Meeting	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Weight before intervention	92,1 kg	92 kg	91,6 kg	91,4 kg	91,1 kg	91 kg	90,8 kg	90,5 kg	90,4 kg	90 kg	89,9 kg	89,5 kg
Weight after intervention	91,8 kg	91,7 kg	91,4 kg	91 kg	91 kg	90,8 kg	90,5 kg	90,2 kg	90 kg	89,8 kg	89,6 kg	89 kg
Total weight loss after twelve meetings										3,1kg		
An.C (Patient Resume)												
Meeting	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Weight before intervention	86 kg	86 kg	85,8 kg	85,7 kg	85,6 kg	85,5 kg	85,3 kg	85 kg	84,7 kg	84,6 kg	84,5 kg	84,2kg
Weight after intervention	85,9 kg	85,8 kg	85,6 kg	85,6 kg	85,4 kg	85,3kg	85 kg	84,8 kg	84,6 kg	84,4 kg	84,2 kg	84 kg
Total weight loss after twelve meetings										2 kg		

Based on table 1, it can be seen that An.A's weight loss after twelve meetings was 3.1 kg. Meanwhile, An.C experienced a weight loss of 2 kg after managing regular physical activity walking in 12

meetings. It can be concluded that physical activity walking can lose weight in obese adolescents. Similarly, research conducted in Sukaharjo Regency in 2021 found that physical activity on foot was able to lose weight effectively (Khairunnisa & Dermawan, 2021).

DISCUSSION

The results obtained from the weight loss of An.A and An.C have a difference of 1.1 kg where An.A managed to lose more weight than An.C. This may be caused by the habit of doing activities that are usually done daily. An.A said that he liked physical activities such as playing bicycles and playing volleyball even though he didn't do it often, while An.C said he didn't have any sports or physical activities that he liked and did at certain times. Doing activities such as cycling and playing actively with peers is one form of light physical activity that can help burn fat accumulation in the body of obese individuals, although not significantly (Wahyuningsih & Pratiwi, 2019).

Light physical activity that can be done in daily life can easily be done by increasing the habit of leisurely walking or avoiding the intensity of sitting time in playing games or social media (Setiawati et al., 2019). In the case of An.C, he said he prefers to interact and communicate or play together virtually compared to participating in direct communication, so An.C spends more time playing gadgets.

The next difference can be seen from the fast food eating habits of the two clients. An.C from a family that has a better economic status, data shows that Mr. S's family, especially An.C, consumes fast food more often because Mrs. K explained that An.C's eating patterns and habits were chosen and carried out on the basis of An's wishes. C itself. While for An.A, although he has the same habit of eating snacks as An.C, An.A's statement said that he likes to eat fast food but rarely, because he often eats cheap snacks that he can easily find from stalls. According to research Istiqomah & Herdiani (2020) that adolescents who have the habit of consuming fast food with the amount and intensity exceeding their needs will lead to an increased risk of accumulation of fat in the body so that body weight will tend to increase easily and lead to obesity. This can indirectly explain that a person's economic status can be a factor causing obesity, therefore parents play a role in regulating the provision of pocket money to children, so that children can minimize the purchase of snacks that can lead to obesity (Telisa et al., 2020).

Although there is a difference in weight loss between An.A and An.C, physical activity walking is still proven to have an effect on weight loss. Based on the above discussion, it can be concluded that walking physical activity is a form of physical activity management that can be used to lose weight in adolescents and can be easily done, does not require special costs and techniques in its implementation.

In carrying out activities, the client said that after walking regularly there were changes in his body that he indirectly felt. Feelings of chest palpitations and an increase in heart rate after doing activities as well as respiratory problems such as shortness of breath begin to decrease. According to research Bhammar et al (2017) walking can be useful in improving blood flow and research Hamila et al (2017) also said that doing physical activity walking with the recommended frequency can keep the heart rate normal after doing the activity.

In addition to having a good physical impact, each client also feels that after doing physical activity walking on a regular basis, it indirectly makes themselves and their minds fresher when done at a time and place that can support comfort in walking. According to the statement (Kemenkes, 2019) that walking can relax the mind and provide positive changes to the brain.

The results of this study are in line with previous research conducted Khairunnisa & Dermawan (2021) which aims to describe the management of walking in obese children is carried out by implementing physical activity walking for 60 minutes in three meetings to get the evaluation results that children experience weight loss due to burning calories and increasing normal metabolic functions in the body. The decrease in complaints in doing physical activity can be denied in the form of complaints of getting tired and increasing body fitness. Research conducted (Darmawati et al., 2020) related to the implementation of the walking program for school children, it is carried out in 3 months and using a physical activity report card produces data on changes in the child's body mass index (BMI) and an increase in the habit of doing daily physical activities from a sedentary lifestyle to a positive habit of doing moderate physical activity. Changes in these habits can improve healthy lifestyles and reduce sedentary lifestyle habits that can increase the rate of calorie waste and lose weight. The pattern of physical activity applied, namely walking and cycling is an effective strategy in reducing abdominal and visceral fat in children.

Research conducted Darmawati et al (2020) related to the implementation of the walking program for school children, it is carried out in 3 months and using a physical activity report card produces data on

changes in the child's body mass index (BMI) and an increase in the habit of doing daily physical activities from a sedentary lifestyle to a positive habit of doing moderate physical activity. Changes in these habits can improve healthy lifestyles and reduce sedentary lifestyle habits that can increase the rate of calorie waste and lose weight. The pattern of physical activity applied, namely walking and cycling is an effective strategy in reducing abdominal and visceral fat in children.

Research conducted in implementing obesity management by Son et al (2017) This is done by doing a physical activity program of walking every 3 sessions in one week and includes 10 minutes of warming up and cooling down. Active walking has a significant positive effect on obesity rates. The results of the analysis showed that there was a decrease in body weight and BMI, an increase in body strength and flexibility which was marked by an increase in muscle tissue and a decrease in waist circumference of obese individuals after the implementation of physical activity walking.

Physical activity walking can increase tolerance in moderate and high physical activity in daily life according to research conducted Kucio et al (2017) who said that the application of walking activity in 4 weeks in obese individuals was able to produce significant changes in increasing exercise tolerance, decreasing body mass and body mass index values in obese individuals. Blood lab results also showed a decrease in triglyceride levels and total cholesterol levels after the implementation of walking physical activity.

Research conducted by Darmawati 2017) explained that changes to healthier living behavior can support the achievement of an ideal body weight in children. This approach includes hypnosis, physical activity and nutrition involving the behavior of children and parents. Effective weight loss by doing physical activity types of endurance for example walking. This activity is carried out in interval training and continuously with other therapies. This therapy results in an increase in a healthy lifestyle and weight loss to a more ideal figure in the child.

CONCLUSION

The results of the study showed that An.A's weight was 92.1 kg and her height was 163 kg. BMI calculation results reached the 98th percentile, which means that An.A is obese. An.A feels ashamed and insecure about her posture because she is often ridiculed by others for being fat. An.A rarely does simple physical activity and does not know the definition of obesity, its signs and symptoms, effects and diseases and management of obesity. Nursing problems that arise in Mr.W's family are Obesity in Mr.W's family, especially An.A (D.0030) and Body Image Disorders in Mr.W's family, especially An.A (D.0083). Implementation of physical activity walking is done three times a week in a span of four weeks. Lasts for 50 minutes starting with heating to cooling. There was weight loss in An.A after doing physical activity on foot, starting from 92.1kg to 89kg for 12 physical activity meetings. The results of the management of walking activities in managed cases prove that the management has an effect on weight loss in obese adolescents.

REFERENCES

Bhammar, D. M., Sawyer, B. J., Tucker, W. J., & Gaesser, G. A. 2017. Breaks in Sitting Time: Effects on Continuously Monitored Glucose and Blood Pressure. *Medicine and Science in Sports and Exercise*. https://doi.org/https://doi.org/10.1249/mss.0000000000001315

CDC. 2021. *About Child & Teen BMI*. https://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html

Dai, H., Alsalhe, T. A., Chalghaf, N., Riccò, M., Bragazzi, N. L., & Wu, J. 2020. The global burden of disease attributable to high body mass index in 195 countries and territories, 1990–2017: An analysis of the Global Burden of Disease Study. *PLOS Medicine*, *17*(7). https://doi.org/10.1371/JOURNAL.PMED.1003198

Darmawati, I. 2017. Literature Review: Application of Han Therapy (Hypnosis, Physical Activity, Nutrition) in Families of School-Age Children with Obesity. Comprehensive Nursing Journal, 3(2), 86–93. https://doi.org/10.33755/jkk.v3i2.89

Darmawati, I., Setiawan, A., & Fitriyani, P. 2020. Implementation of the Walking and Cycling Program for School Age Children in Depok City. Journal of Sports Education, *9*(2), 181–191. https://doi.org/10.31571/jpo.v9i2.1913

Gichara, J. 2019. Healthy Walk For Fitness and Body Strength. Library Friends.

Hamila, A., Younes, M., Cottin, F., Amor, Y. Ben, Shephard, R., Tabka, Z., & Bouhlel, E. 2017. Effects of walking exercises on body composition, heart rate variability, and perceptual responses in overweight and obese adolescents. *Science Direct : Science & Sports*, *33*(5).

https://doi.org/https://doi.org/10.1016/j.scispo.2018.03.076.

Haryono, I. R., & Prastowo, N. A. 2020. Counseling on Correct Walking Techniques for Elderly Groups at the Nurdin Indonesian Christian Church, Jakarta. Indonesian Community Service Journal, *3*(1), 284–292. https://doi.org/10.24912/jbmi.v3i1.8056

Istiqomah, V. P. I., & Herdiani, N. 2020. Literature Review: Diet and Physical Activity in Obese Adolescents. *National Conference for …*. https://103.106.72.138/index.php/NCU2020/article/view/634%0Ahttps://103.106.72.138/index.php/NCU2020/article/download/634/315

Kelen, H. O., Situngkir, R., & Paembonan, H. 2020. The Relationship between Obesity and Body Image in Adolescents at Brothers Senior High School Makassar. Florence Nightingale's Journal of Nursing *(JKFN)*, *3*(1), 25–29. https://doi.org/10.52774/jkfn.v3i1.51

Kemenkes. 2017. Guidelines for the Implementation of the Nusantara Movement to Reduce Obesity Rates (GENTAS) (pp. 1–41). http://p2ptm.kemkes.go.id/uploads/N2VaaXIxZGZwWFpEL1VlRFdQQ3ZRZz09/2017/11/Pedoman_Umum_Gentas_Gerakan_berantas_obesitas.pdf

Kemenkes. 2019, May 2. What Happens to Your Body If You Walk Every Day?http://p2ptm.kemkes.go.id/artikel-sehat/apa-yang-terjadi-pada-tubuh-jika-rajin-jalan-kaki-tiap-hari

Kemenkes RI. 2018. Basic Health Research National Report (RISKESDAS) 2018. Indonesian Ministry of Health, 1–582. https://dinkes.kalbarprov.go.id/wp-content/uploads/2019/03/Laporan-Riskesdas-2018-Nasional.pdf

Khairunnisa, W. A., & Dermawan, D. 2021. Management of Walking Sports in School-Age Children with Obesity Nursing Problems in Sengon Village, Sukoharjo Regency. Indonesian Journal On Medical Science, *8*(1), 66–74.

Kucio, C., Narloch, D., Kucio, E., & Kurek, J. 2017. The application of nordic walking in the treatment hypertension and obesity. *Family Medicine and Primary Care Review*, *19*(2), 144–148.https://doi.org/10.5114/fmpcr.2017.67870

Lestari, S. R., Trilianto, A. E., & Siddiq, P. 2021. Relationship between Adolescent Obesity and Body Image in MTSN 1 Bondowoso, Traktakan Village, Wonosari District. Journal of Professional Nursing, *9*(1), 36–46. https://doi.org/10.33650/jkp.v9i1.2036

McPhee, P. G., Singh, S., & Morrison, K. M. 2020. Childhood Obesity and Cardiovascular Disease Risk: Working Toward Solutions. *Canadian Journal of Cardiology*, *36*(9), 1352–1361.https://doi.org/10.1016/j.cjca.2020.06.020

Mori, N., Armada, F., & Willcox, D. C. 2012. Walking to school in Japan and childhood obesity prevention: New lessons from an old policy. *American Journal of Public Health*, *102*(11), 2068–2073. https://doi.org/10.2105/AJPH.2012.300913

PPNI. 2018. *Indonesian Nursing Outcome Standards Definition and Criteria for Nursing Outcomes (SLKI) (1st ed.).* PPNI Central Executive Board.

Sagar, R., & Gupta, T. 2018. Psychological Aspects of Obesity in Children and Adolescents. *Indian Journal of Pediatrics*, *85*(7), 554–559. https://doi.org/10.1007/s12098-017-2539-2

Sembiring, B. A., Rosdewi, N. N., & Yuningrum, H. 2022. Relationship of Physical Activity with Obesity Incidence in Adolescents at SMA Swasta Cerdas Bangsa, Deli Tua District, Deli Serdang Regency, Medan.*Jurnal Formil (Forum Ilmiah) Kesmas Respati*, *7*(1), 87. https://doi.org/10.35842/formil.v7i1.421

Setiawati, F. S., Mahmudiono, T., Ramadhani, N., & Hidayati, K. F. 2019. Intensity of Social Media Use, Sports Habits, and Obesity in Adolescents at SMA Negeri 6 Surabaya in 2019. *Amerta Nutrition*, *3*(3), 142. https://doi.org/10.20473/amnt.v3i3.2019.142-148

Setiyaningrum, E. 2017. *The Development of Adolescent Health Problems and Solutions* (1st ed.). Indomedia Pustaka.

Silva, D. A. S., Lang, J. J., Petroski, E. L., Mello, J. B., Gaya, A. C. A., & Tremblay, M. S. 2020. Association between 9-minute walk/run test and obesity among children and adolescents: Evidence for criterion-referenced cut-points. *PeerJ*, *2020*(2), 1–13. https://doi.org/10.7717/peerj.8651

Son, S., Jeon, B., & Kim, H. 2017. Effects of a walking exercise program for obese individuals with intellectual disability staying in a residential care facility. *Journal of Physical Therapy Science*, *28*(3), 788–793. https://doi.org/10.1589/jpts.28.788

Sulaiman, H., Purnama, S., Holilulloh, A., Hidayati, L., & Saleh, N. H. 2020. *Child and Adolescent Developmental Psychology. Cross-Cultural*

Parenting (N. Asri (ed.); 1st ed.). Remaja Rosdakarya.

Sumaryoto, & Nopembri, S. 2017. *Physical Education, Sports and Health Class XI. Center for Curriculum and Books,* Balitbang, Ministry of Education and Culture.

Telisa, I., Hartati, Y., & Haripamilu, A. D. 2020. Risk Factors for Obesity in High School Teenagers Risk Factors of Obesity among Adolescents in Senior High School.*Faletehan Health Journal*, *7*(3), 124–131.

Wahyuningsih, R., & Pratiwi, I. G. 2019. The relationship between physical activity and the incidence of obesity in adolescents at the Department of Nutrition at the Mataram Health Polytechnic. *AcTion: Aceh Nutrition Journal*, *4*(2), 163. https://doi.org/10.30867/action.v4i2.180