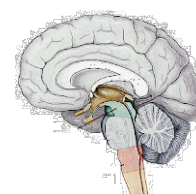


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EFFECTIVENESS OF PSYCHOEDUCATIONAL TRANSFORMATION MODEL FOR ADOLESCENT GIRLS WITH OBESITY

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ABSTRACT

Obese adolescent girls have a higher risk of developing depression, which can significantly affect quality of life. Therefore, this study aimed to evaluate the effectiveness of Psychoeducational Transformation Model as a depression prevention strategy. A quasi-experimental method was used with a pre-posttest control group design. The sample consisted of 58 obese adolescent girls, divided into two groups, namely intervention and control. The results showed that Psychoeducational Transformation Model significantly improved the knowledge, attitudes, and actions to prevent depression in obese adolescent girls ($p < 0.05$). Furthermore, the intervention group showed greater improvement compared to the control. These results supported the effectiveness of the Psychoeducational Transformation Model as a depression prevention strategy. It can be concluded that the Model was effective in increasing understanding and preventing depression. In addition, the involvement of various parties in the adolescent support system is key to creating an environment that supports mental and emotional health.

INTRODUCTION

The global prevalence of obesity has increased to more than 1.9 billion (WHO, 2017). World Population Review reported that countries in Pacific Region have the highest rates in the world, where more than 50% of the population was obese (WHO, 2021). Furthermore, obesity is a chronic disease that causes biological and psychological health problems (*National Center for Health Statistics*, 2020). Depression is the most common form of psychological disorder in adolescents and a study showed that depressive symptoms increased during early and middle adolescence (Wilson, et. al., 2021). Based on a study of 69,893 obese adolescents in China, the prevalence of depression ranged from 10.1% to 26.7% (Mannan, Mamun, & Clavarino, 2016). The prevalence among overweight and obese adolescent girls was significantly higher than boys (depression: 21.73%, OR = 1.46, 95% CI: 1.14, 1.87, $p = 0.003$) (Andrie, et.al., 2021). In Indonesia, the results of a study on 144,000 respondents showed obese adolescent girls were 40% more at risk of experiencing depression than those with ideal weight (Felix, et.al., 2020). These results were supported by other surveys, showing 40% of adolescent girls had symptoms of depression than boys with 24% (Mcmanus, & Temples, 2021). Obesity and depression are serious problems and burden of disease because they affect quality of life based on the calculation of Disability Adjusted Life Years (DALYs) and higher treatment costs as adults (Wilson, et. al., 2021). According to

World Health Organization (2017), financing of obesity and depression in some developed countries ranged from 2-7% of total health financin. Moreover, depression can cause engagement in unhealthy and inappropriate habits of controlling obesity which has an impact on the digestive, cardiovascular, and renal systems. Obese adolescent girls reported that the majority of peers do body shaming, bullying, discrimination, and intimidation (92%), others were physical education teachers (8%) (Rao, et.al., 2020). Therefore, serious efforts are needed from various parties to overcome this challenge.

Strategies to prevent depression include increasing knowledge, building positive attitudes, and promoting personal development (Andrie et. al, 2021). The prevention of psychological and social impacts of obesity, specifically for adolescent girls, has not yet existed in Indonesia. Comprehensive synergy is needed in obesity control including psychological and social methods. Various nursing models have relevance in handling this problem through personal, family, and other socio-environmental methods (Id, Lynne, Witherspoon & Black, 2020). However, the three models are still compartmentalized, and it is necessary to develop a comprehensive model that includes all parties.

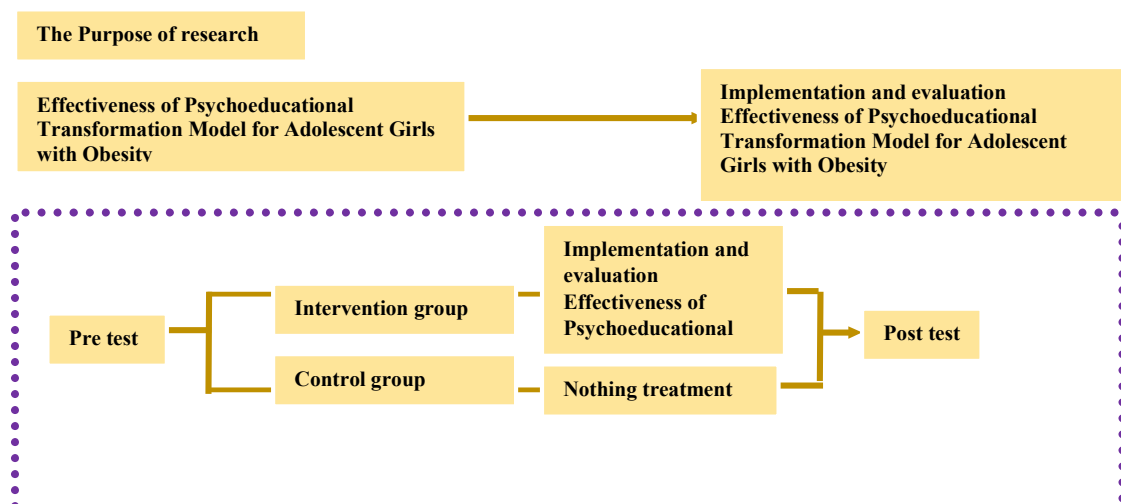
Psychoeducational Transformation Model is an innovation and solution in the prevention of depression. Psychoeducation is defined as an intervention with a systematic and structured knowledge transfer, integrating emotional and motivational aspects to prevent depression. Meanwhile, Psychoeducational Transformation is a comprehensive intervention change for adolescent girls and supporting systems, namely family, peers, teachers, and Puskesmas in comprehensively building psychological resilience (Roy, et.al., 2021). Therefore, it is more effective in preventing depression and adolescents can correctly and appropriately control obesity.

METHODS

1. Study design, setting, and sampling strategy

This study used a quantitative method with a quasi-experimental and pre-posttest control group design. Module interventions and Psychoeducational Transformation models were provided in the intervention group. Furthermore, the sample selection used a randomized trial method to assess changes in knowledge, attitudes, actions related to prevention efforts, and the level of depression risk. A total sample of 58 adolescent girls was obtained and divided into experimental and control groups.

Figure 1. Diagram Consortium of Study



2. Participants

A total of 29 respondents were divided into experimental and control groups each, with specific criteria, namely being obese, having compos mentis consciousness, can speak Indonesian, reading and writing, currently attending lower and cooperative higher secondary school, willing to participate in the study, and domiciled in Pekanbaru City, Riau.

3. Intervention

Psychoeducational Transformation Implementation process was carried out for three sessions. The first session included material about the concept of depression, adolescence, and obesity, while the second was knowledge about depression prevention efforts. Furthermore, the third session included skills on depression prevention efforts. The implementation time of the activity was carried out in 2 weeks. In the following week, psychoeducation was carried out on the support system, including 29 families, 15 peers, 10 school teachers, and 4 Puskesmas nurses in 2 sessions. The first session covered the knowledge of providing support and motivation to prevent depression, while the second session included the skills of providing support and motivation. After teaching was carried out to the support system, it was expected that adolescents have received motivational support from various parties. In addition, a post-test was conducted the following week to assess the effectiveness of the activities.

4. Data collection

The intervention and control groups were independent of each other. After participating in the study by providing Psychoeducational Transformation model for 10 weeks, both groups were measured to assess knowledge, attitudes, actions to prevent depression, and the level of risk. Furthermore, data collection techniques and procedures differed between both groups. Before receiving any treatment, the intervention group completed a pre-test questionnaire. Measurements were subsequently taken 3 weeks after the intervention (Tompkins, Laurent, & Brock, 2017). In the intervention process, the intervention group received Psychoeducational Transformation model, while the control group did not undergo such treatment. Respondents were asked to complete questionnaires on knowledge, attitude, and behavior related to depression prevention. The knowledge questionnaire comprised 10 questions, with a maximum point of 20. The attitude and depression prevention behavior questionnaires comprised 10 questions each, with a maximum score of 40. The responses were categorized as low or high based on whether they fell below or above the predetermined cutoff points, respectively, according to the average score on each questionnaire.

5. Statistical analysis

Statistical analysis was carried out to examine various aspects of the data. Univariate data analysis was conducted to assess the distribution of respondent demographic data, the dependent variable, namely prevention of depression in obese adolescent girls, and independent variables, namely knowledge, attitudes, and actions. This included measuring the proportion and frequency distribution for each variable. Bivariate analysis was conducted in two stages. Firstly, data normality test was carried out to determine the appropriate type of statistical test for both the intervention and control groups. Paired t-test was used for normally distributed data, while Wilcoxon test was used for non-normally distributed data. Hypothesis testing aimed at evaluating differences between treatment groups used independent t-test for normally distributed data and Mann-Whitney test for non-normally distributed data.

RESULTS AND DISCUSSION

Characteristics of participants

Table 1 shows the frequency distribution and equality analysis of homogeneous respondent characteristics from a total of 58 respondents. The analysis showed $p > 0.05$ for both the experimental and control groups, with homogeneity in body weight of 0.234, height of 0.208, age of 0.254, and degree of obesity of 0.078. Therefore, the characteristics of the two groups were similar, minimizing bias in data.

Table 1. Characteristics of Adolescent Girls with Obesity (n=58)

Characteristics	Intervention		Control		p-value
	f	%	f	%	
Weight (kg)					
70-80	19	65.5	16	55.2	0.234
81-90	8	27.6	6	20.7	
91-101	2	6.9	7	24.1	
Height (cm)					
148-154	12	41.4	8	27.6	0.208
155-161	12	41.4	11	37.9	
162-168	5	17.2	10	34.5	
Age (years)					
15-16	7	24.1	4	13.8	0.254
17-18	17	58.6	19	65.5	
19-20	5	17.2	6	20.7	
Obesity Category (n)					
Obesity I	29	100	26	89.7	0.078
Obesity II	0	0	3	10.3	
Religion (n)					
Islam	25	86.2	28	96.6	0.194
Protestant	4	13.8	0	0	
Catholic	0	0	1	3.4	
Ethnic Group (n)					
Malay	9	31.0	6	20.7	0.161
Minang	8	27.6	10	34.5	
China	1	3.4	0	0	
Batak	5	17.2	1	3.4	
Others	6	20.7	12	41.4	
Economic Status (n)					
Less than minimum wages	12	41.4	20	69.0	0.127
More than minimum wage	17	58.6	9	31.0	

* Statistically significant at $p < 0.05$

Homogeneity Test for Early Detection of Depression in the Intervention and Control Groups of Obese Adolescent Girls

Based on Table 2, the equality test of respondents in both the intervention and control groups regarding early detection of depression in adolescents resulted in a significant value greater than 0.05 (p value > 0.05). Therefore, there was no significant difference in respondents' characteristics.

Table 2 Homogeneity Test of Early Detection of Depression in the Intervention and Control Groups of Obese Adolescent Girls

Variable	Intervention Group		Control Group		p-value
	Mean $\pm$ SD	Min-Max	Mean $\pm$ SD	Min-Max	
Early detection of depression in adolescents	33.66 $\pm$ 11.15	21-65	33.52 $\pm$ 12.28	11-64	0.893

* Statistically significant at $p > 0.05$

Differences in Knowledge, Attitudes, and Preventive Measures of Obese Adolescent Girls in the Intervention Group

Table 3 shows that the knowledge, action, and attitude scores of adolescents had a p value <0.05 . The paired t -test showed a significant difference between the scores before and after the intervention, as further supported by the median and mean values. For instance, the knowledge variable of adolescents initially had a mean value of 6.00, which increased to 9.00 after the intervention. The variable of depression prevention actions increased significantly from 18.00 to 29.00. This trend was also observed in the adolescent attitude variable, where the mean value increased from 29.59 before the intervention to 35.90 after the intervention. Therefore, Psychoeducational Transformation effectively improved the knowledge, attitudes, and preventive actions of adolescents.

Table 3 Differences in knowledge, attitudes and preventive measures of obese adolescent girls in the intervention group

Variable	Intervention (n= 29)		<i>p</i> -value
	Pre-test	Post-test	
	Median $\pm$ SD	Median $\pm$ SD	
Adolescent Knowledge	6.00 $\pm$ 1.370	9.00 $\pm$ 0.704	0.001 ^a
Precautions	18.00 $\pm$ 6.032	29.00 $\pm$ 4.892	0.001 ^a
Variable	Pre-test	Post-test	
	Mean $\pm$ SD	Mean $\pm$ SD	
Adolescent Attitudes	29.59 $\pm$ 4.975	35.90 $\pm$ 2.554	0.001 ^b

* Statistically significant at $p < 0.05$ ^a = Wilcoxon test. ^b = Dependent t -test

Differences in Knowledge, Attitudes, and Preventive Measures of Obese Adolescent Girls in the Control Group (Control Group Dependent t-test)

Based on Table 4, the knowledge and attitude scores of adolescents had a p value > 0.05 , showing that there was no significant difference before and after the intervention. These results were supported by the median and mean values. Specifically, the median adolescent knowledge variable was relatively stable at 6.28, with a negligible change of 0.03. Similarly, the adolescent attitude variable observed a change of only 0.01. These results showed the lack of significant progress in adolescents' knowledge and attitudes without the intervention of Psychoeducational Transformation. In the case of adolescent precautions, the control group showed a difference in results before and after the intervention. This change in value amounted to 0.04, confirming some improvement, although not as significant as observed in the intervention group.

Table 4 Differences in Knowledge, Attitudes, And Preventive Measures Of Obese Adolescent Girls In The Intervention Group

Variable	Control (n= 29)		<i>p</i> -value
	Pre-test	Post-test	
	Mean $\pm$ SD	Mean $\pm$ SD	
Adolescent Knowledge	6.28 $\pm$ 1.437	6.31 $\pm$ 1.312	0.887 ^a
Variable	Pre-test	Post-test	
	Median $\pm$ SD	Median $\pm$ SD	
Adolescent Attitudes	29.00 $\pm$ 4.975	30.00 $\pm$ 4.702	0.696 ^b
Precautions	17.00 $\pm$ 6.594	21.00 $\pm$ 4.880	0.010 ^b

* Statistically significant at $p < 0.05$ ^a = Dependent t -test. ^b = Wilcoxon test

Effects of Psychoeducational Transformation Model in Knowledge, Attitudes, and Actions to Prevent Depression for Adolescent Girls with Obesity

Based on Table 5, adolescents' knowledge, attitudes, and preventive actions against depression in both the intervention and control groups had a p value < 0.05 . The results showed that Psychoeducational Transformation intervention contributed to changes in knowledge, attitudes and preventive actions. This was further supported by the standard deviation, confirming the relative closeness of the distribution of data.

Table 5 Differences In Knowledge, Attitudes, And Actions To Prevent Adolescent Depression Before And After Health Education In Intervention And Control Groups (n=58)

Final HIV/AIDS Health Education in Intervention and Control Groups (n = 58)			
Variable	Group (n= 58)		p-value
	Difference	Difference	
	Intervention	Control	
	Mean $\pm$ SD	Mean $\pm$ SD	
Adolescent Knowledge	2,72 $\pm$ 1,386	0,03 $\pm$ 1,295	0,001 ^a
Adolescent Attitudes	6,31 $\pm$ 4,302	0,41 $\pm$ 4,468	0,001 ^a
Variable	Pre-test	Post-test	0.001 ^b
	Median $\pm$ SD	Median $\pm$ SD	
Precautions	10,0 $\pm$ 4,894	1,00 $\pm$ 6,140	

* Statistically significant at $p < 0.05$ ^a= Independent t-test. ^b= Mann Whiney test

The results showed that Psychoeducational Transformation intervention model statistically influenced knowledge, attitudes and depression prevention actions in adolescents, with a significant p value = 0.001. The mean and median scores of the intervention group, through Psychoeducational Transformation model, showed an increase of 3.00 points in knowledge, 11.00 in preventive actions, and 6 in attitudes. This difference was statistically significant with p value < 0.05 . Conversely, the control group only experienced a maximum change of 4.00 points, with a significance level of p value > 0.05 .

The results were supported by Reece, et.al. (2021), stating that health education, through modules, influenced the knowledge, attitudes and behavior of adolescents with obesity. Several other studies also supported that education, through printed media instruments, affected the knowledge and behavior of adolescents with excess body weight (McLaughlin & King, 2021). Studies using effective media instruments for obesity prevention efforts significantly increased knowledge and attitudes, and weight loss among adolescents in the intervention group (Brumarin, & Kerns, 2010). In support of the current study, module teaching media could foster knowledge about mental health and change attitudes in female students (Krishen, & Worthen, 2011).

Modules serve as valuable learning tools to facilitate the acquisition of knowledge, understanding, and application of taught material. As an educational medium, modules address the constraints of time and space inherent in conventional teaching methods by fostering independent learning. The results were supported by other studies showing that peer nutrition education modules had a positive influence on adolescents' knowledge and attitudes toward obesity. Therefore, an educational method constituting peers and using modules as learning tools can effectively improve adolescents' understanding and attitudes toward obesity issues (Fenner, et. al 2016).

Obesity is not only a physical issue but also as an implicit social problem leading to stigmatization. Previous studies on the correlation between being overweight and bullying provided various explanations, all showing that being overweight deviated from social norms (Levers-landis, Dykstra & Riordan, 2011).

Furthermore, obese individuals often struggle to fully accept themselves, prompting some to seek changes through invasive surgery such as bariatric surgery to rediscover lost identity (Wilson, et. All., 2021).

Psychological issues associated with obesity originate from feelings of shame, regret, and guilt about a body condition. Some resort to extreme dieting, medications, or even experience suicidal thoughts. Failure to effectively address this issue can have serious consequences, specifically for adolescents experiencing depression due to obesity (Wang, Bai, Wei & Jia, 2019).

This condition arises from decreased satisfaction with body parts, such as the shape of the face, upper, middle, and lower body, prompting individuals to consider altering their appearance. A positive response can lead to improvements, but maladaptive coping mechanisms may trigger Overweight Preoccupation (Anxiety about being fat), further leading to self-image disturbances (Sutaria, Devakumar & Saxena, 2020).

Psychoeducational Transformation model, implemented through Psychoeducational Transformation health module targeting families, peers, teachers, and health workers, contributes to increasing knowledge, attitudes, and actions to prevent depression in obese adolescents. These results were supported by participants' enthusiasm for psychoeducation sessions summarized in the evaluation questionnaire. Approximately 90% expressed satisfaction with teachers' ability to deliver material and the facilities available.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, Psychoeducational Transformation, as an innovative strategy, was effective in preventing depression among obese adolescents. It can be integrated into adolescent support systems, such as peers, families, school teachers, and health workers to provide reinforcement to adolescents in adopting adaptive coping mechanisms for their physical conditions. Therefore, the engagement of various parties is crucial to establishing a supportive system that strengthens the mental and emotional resilience of adolescents in navigating health challenges within a conducive social environment.

Ethics approval

This study protocol was approved by the Medical and Health Research Ethics Committee of Andalas University, Padang, West Sumatra, Indonesia. Furthermore, it was conducted in accordance with the Declaration of Helsinki and the Nuremberg Code of Ethics with reference number 163/UN.16.2/KEP-FK/2023.

Competing interests

The authors declare no conflicts of interest.

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Underlying data

Derived data supporting the findings of this study are available from the corresponding author on request.

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REFERENCES

- Andrie, E. K., Melissourgou, M., Gryparis, A., Vlachopapadopoulou, E., Michalacos, S., Renouf, A., Sergeantanis, T. N., Bacopoulou, F., Karavanaki, K., Tsolia, M., & Tsitsika, A. (2021). *Psychosocial Factors and Obesity in Adolescence : A Case-Control Study*. 1–12.
- Brumarin, L. E., & Kerns, K. A. (2010). Parent–child attachment and internalizing symptoms in childhood and adolescence: A review of empirical findings and future directions. *Development and psychopathology*, 22(1), 177-203.
- Felix, J., Stark, R., Teuner, C., Leidl, R., Lennerz, B., Brandt, S., Schnurbein, J. von, Moss, A., Bollow, E., Sergeyev, E., Mühlig, Y., Wiegand, S., Holl, R. W., Reinehr, T., Kiess, W., Scherag, A., & Hebebrand, J. (2020). *Health related quality of life associated with extreme obesity in adolescents – results from the baseline evaluation of the YES-study*. 1–12.
- Fenner, A. A., Howie, E. K., Davis, M. C., & Straker, L. M. (2016). Relationships between psychosocial outcomes in adolescents who are obese and their parents during a multi-disciplinary family-based healthy lifestyle intervention : One-year follow-up of a waitlist controlled trial (Curtin University ' s Activity , Food . *Health and Quality of Life Outcomes*, 1–10. <https://doi.org/10.1186/s12955-016-0501-z>
- Id, Y. W., Lynne, S. D., Witherspoon, D., & Black, M. M. (2020). *Longitudinal bidirectional relations between body dissatisfaction and depressive symptoms among Black adolescents : A cross-lagged panel analysis*. 1–17. <https://doi.org/10.1371/journal.pone.0228585>
- Krishen, A. S., & Worthen, D. (2011). Body image dissatisfaction and self-esteem: A consumer-centric exploration and a proposed research agenda. *Journal of Marketing Analytics*. 24, 90-106
- Levers-landis, C. E., Dykstra, C., Uli, N., & Riordan, M. A. O. (n.d.). *Weight-Related Teasing of Adolescents Who Are Primarily Obese : Roles of Sociocultural Attitudes Towards Appearance and Physical Activity Self-Efficacy*. 1–17.
- Mannan, M., Mamun, A., Doi, S., & Clavarino, A. (2016). *Prospective Associations between Depression and Obesity for Adolescent Males and Females- A Systematic Review and Meta- Analysis of Longitudinal Studies*. 1–18. <https://doi.org/10.1371/journal.pone.0157240>
- McLaughlin KA, King K. Developmental trajectories of anxiety and depression in early adolescence. *Journal of Abnormal Child Psychology*. 43: 311-23. DOI: 10.1007/S10802-014-9898-1
- Mcmanus, K., & Temples, H. (2021). The Journal for Nurse Practitioners Obesity in Adolescents : Prevention and Treatment to Change Their Future. *TJNP: The Journal for Nurse Practitioners*, 17(8), 972–978. <https://doi.org/10.1016/j.nurpra.2021.04.018>
- National Center for Health Statistics (NCHS, 2020). NCHS Fact Sheet, December 2020. U.S. Department of Health and Human Services
- Rao, W., Zong, Q., Zhang, J., An, F., Jackson, T., Ungvari, G. S., Xiang, Y., Su, Y., Arcy, C. D., & Xiang, Y. (2020). Obesity increases the risk of depression in children and adolescents: results from a systematic review and meta-analysis. *Journal of Affective Disorders*. <https://doi.org/10.1016/j.jad.2020.01.154>
- Reece, L. J., Bissell, P., Sachdev, P., Wright, N., Mihrshahi, S., & Copeland, R. J. (2021). *the rest myself ” : Adolescents living with severe obesity experiences of an intra-gastric balloon alongside a lifestyle support programme*. 1–10. <https://doi.org/10.1186/s12887-021-02902-x>
- Roy, S. K., Jahan, K., Alam, N., Rois, R., Ferdaus, A., Israt, S., & Karim, R. (2021). Perceived stress , eating behavior , and overweight and obesity among urban adolescents. *Journal of Health, Population and Nutrition*, 1–13. <https://doi.org/10.1186/s41043-021-00279-2>

- Sutaria, S., Devakumar, D., Yasuda, S. S., Das, S., & Saxena, S. (2020). Is obesity associated with depression in children? Systematic review and meta-analysis. *Archives of disease in childhood*, 104(1), 64-74.
- Tompkins, C. L., Laurent, J., & Brock, D. W. (2017). *Management for Obese Adolescents*. X(X), 1–8. <https://doi.org/10.1089/chi.2017.0003>
- W Burniat, T Cole, I Lissau, E Poskitt, eds. *Child and Adolescent Obesity*. (2002). *Causes and Consequences, Prevention and Management*. Cambridge, UK: Cambridge University Press. doi:10.1079/PHN2003495
- Wang, S., Sun, Q., Zhai, L., Bai, Y., Wei, W., & Jia, L. (2019). *The Prevalence of Depression and Anxiety Symptoms among Overweight / Obese and Non-Overweight / Non-Obese Children / Adolescents in China : A Systematic Review and Meta-Analysis*. <https://doi.org/10.3390/ijerph16030340>
- Wilson, D. K., Sweeney, A. M., Quattlebaum, M., Loncar, H., Kipp, C., & Brown, A. (2021). *The Moderating Effects of the Families Improving Together (FIT) for Weight Loss Intervention and Parenting Factors on American Adolescents*.
- World Health Organization. (2017). The 2017 World Obesity Day and obesity prevention and control efforts in China. *Global Health Journal*.
- World Population Review. (2021). Developed Countries List 2021. *World Popul. Rev*.
- World Health Organization. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. WHO, Rev
- Wilson, D. K., Sweeney, A. M., Quattlebaum, M., Loncar, H., Kipp, C., & Brown, A. (2021). *The Moderating Effects of the Families Improving Together (FIT) for Weight Loss Intervention and Parenting Factors on American Adolescents*.