Factors Affected the Physical Activity in Adolescents with Risk of Obesity in Rural Aceh

Risqina Putri1,2
Popi Lya Destari2
Afriilia Fazrina3

1,2 Department of Family Nursing, Academy of Nursing Kesdam Iskandar Muda Banda Aceh, Banda Aceh, Indonesia
3 Department Management of Nursing, Academy of Nursing Kesdam Iskandar Muda Banda Aceh, Banda Aceh, Indonesia

ABSTRACT
Physical activity is any movement that requires energy expenditure by the body’s skeleton and muscles. Lack of physical activity can increase the risk of obesity which has the potential of negative impacts on the physical and psychological health of adolescents. It can also increase the incidence of non-communicable diseases in adulthood. This study was conducted to determine the factors that affected the physical activity of adolescents at risk of obesity in rural Aceh. A cross-sectional study was conducted at two senior high schools in rural Aceh. There were 134 respondents were taken by using a simple random sampling technique. Data were collected using a demographic data questionnaire, The Adolescents Sedentary Activity Questionnaire (ASAQ), the Social Support for Exercise Scale and the Physical Activity Questionnaire-Adolescents (PAQ-A). The analysis was carried out using chi-square test and multiple logistic regression test. The results showed that parental education (p=0.025; OR=7.142) was the most affected factor toward physical activity in adolescents with a risk of obesity. Its suggested that local schools to increase the involvements of adolescents at risk of obesity in school extracurricular programs and collaborate with the public health centre to provide health education for parents of adolescents about the importance of physical activity for adolescent’s health.

KEYWORDS
Physical Activity; Adolescents; Risk of Obesity; Parental Education

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Introduction
Adolescence is a transition from childhood to adulthood, not only transitioning in terms of ages, but also including lifestyle aspects (Wagner et al., 2016). Overweight or obesity is one of health problem which attacks adolescents in modern times (Sundar et al., 2018). Globally, more than 340 million children and adolescents aged 5-19 years have been overweight and obese. It could happen because more than 80% of the world’s youth population has less physical activity (World Health Organization, 2021). Indonesian Center for Health Data and Information reported that the prevalence of obesity with a Body Mass Index (BMI) of 25-27 and BMI of 27 in the population aged 15 years is 35.4% (Ministry of Health of Republic Indonesia, 2020). Aceh Province is one of the provinces with an increasing prevalence of obesity in Indonesia. Proved from the report of the visitors of the Public Health Center in Aceh aged ≥15 years were detected in the obese category as many as 42,441 (10%), which women were 31,295 people (12%) and men were 11,146 people (7%) (Public Health Office of Aceh, 2019).

The high obesity prevalence above caused millions of adolescents in this modern era are less aware of the importance of physical activity and already have sedentary lifestyles (Shaw & Shaw, 2014). Adolescents with high sedentary lifestyles have the potential to experience cardiovascular disease and metabolic syndrome. A sedentary lifestyle also causes negative psychological impacts and a high risk of experiencing mental health disorders such as depression and anxiety (Throuvala et al., 2021). Adolescents with obesity often experience social discrimination due to changes in body shape, become victims of bullying, impaired body image, and can experience low self-esteem (Loring & Robertson, 2014). To prevent risk conditions of obesity in adolescents, nurses as health professionals need to be aware of the physical activity habits of adolescents, especially at school. School is the main target for increasing the prevention of obesity risk due to the lack of physical activity in adolescents (Foubister et al., 2021).

Health Promotion Model (HPM) developed by Pender in 1996 was applied as a conceptual framework in this study. HPM consists of three basic components regarding health-related behavior, such as characteristics and individual experience (previous behavior and personal factors), knowledge (perceived benefits, barriers, self-efficacy), (commitment to action plans, demands and preferences) (Alligood, 2014).

Based on HPM, the previous study found that demographic characteristics, sedentary activity, social support including family/parents support and situational factors such as school sports facilities and sports...
facilities at home by parents have significant correlation with physical activity in adolescents (Gontarev & Kalac, 2016). Based on this description, the researchers want to determine the factors that affect the physical activity of adolescents with a risk of obesity in rural Aceh.

Method

A cross-sectional study was conducted on August 6th-24th, 2022 at two senior high schools in rural Aceh. The nutritional status screening was carried out in July 2022, so we found a total population that confirmed having risks of obesity at that school were 138 adolescents. The adolescents with the risk of obesity category had BMI in the range between +1 SD until +2 SD. The independent variables in this study were gender, parental education, parental occupation, parental income, situational factors, sedentary activity, family social support and peer social support. While the dependent variable was the physical activity of adolescents. This research was analyze by using IBM SPSS Statistic Ver. 21.

Participants

The population of this study were all of adolescents with a risk of obesity in two senior high schools in rural Aceh. The sample size was determined using Cohen’s, and then we used a simple random sampling technique to determine the total number of respondents, so we got 135 respondents. Adolescents’ risk of obesity with endocrine disease, musculoskeletal disease, neurologist disease, disability, and lack of parental permission were excluded from the study. Based on that exclusion criteria, one sample didn't have permission from the parent to participate in this study, so there were 134 adolescents with a risk of obesity recruited in this study.

Instruments

The study instruments were questionnaire forms, including a sociodemographic characteristics questionnaire (respondent code, class, age, gender, and parental data such as parental education level, parental occupation, and parental income per month), Physical Activity Questionnaire Adolescents (PAQ-A) to collect the physical activity data of respondents for the last 7 days with the Cronbach alpha coefficient between 0.79 - 0.89 (Kowalski et al., 2004; Mohamadian & Arani, 2014; Porres et al., 2016), The Adolescents Sedentary Activity Questionnaire (ASAQ) with the Cronbach alpha coefficient is 0.86 (Hardy et al., 2007; Pramita & Griadhi, 2016) and Social Support for Exercise Scale to collect the data of family social support and peer social support with the Cronbach alpha coefficient are 0.90 and 0.89 respectively (Hsu et al., 2011).

Data analysis

The statistical test used is the chi-square test and multiple logistic regression test to determine which independent variables have the strongest relationship with physical activity in adolescents with a risk of obesity.

Results

Socio-demographic Characteristics

| Table 1. Frequency Distribution of Socio-demographic Characteristics and Factors Affected Variables of Respondents (n=134) |
|---|---|---|
| **Socio-demographic Characteristics** | **Frequency (f)** | **Percentage (%)** |
| Gender | | |
| Female | 71 | 53.0 |
| Male | 63 | 47.0 |
| Parental Education | | |
| Low education level | 123 | 91.8 |
| High education level | 11 | 8.2 |
| Parental Occupation | | |
| Agraris | 71 | 53.0 |
| Non Agraris | 63 | 47.0 |
| Parental Income/Month | | |
| Less than the public minimum salary | 115 | 85.8 |
| More than the public minimum salary | 19 | 14.2 |
| Situational Factor | | |
| Not Involved in school extracurricular | 87 | 64.9 |
Table 1 shows that majority of the respondents were female as many as 71 adolescents (53.0%). Most respondents have parents with low education levels as many as 123 people (91.8%). The majority of parental occupations were agrarian as many as 71 people (53.0%) and the dominant parent's income per month in less than the public minimum salary category of as many as 115 people (85.8%). Then, most of the respondents were not involved in school extracurricular activity as many as 87 adolescents (64.9%) and dominant in high sedentary activity as many as 129 adolescents (96.3%). Most of the respondents have high family social support and low peer social support as many as 75 people (56.0%) and 69 people (51.5%), respectively.

Table 2 shows that the majority of the respondents had low physical activity level as many as 126 adolescents (94.0%).

**Bivariate analysis**

Table 3 shows there were a significant relationship between parental education (p=0.002 < 0.05) and situational factors(p=0.003 < 0.05) with physical activity in adolescents at risk of obesity in rural Aceh.

**Validity of content**

Table 4 shows that the factor that affected physical activity in adolescents with a risk of obesity in rural Aceh was parental education (p=0.025; OR 7.142).

**Discussion**

The parental education level was the strongest factor that affected physical activity in risk of obesity adolescents (p-value 0.025; OR 7.142) in this study. It means parents with high education have the opportunity to increase the physical activity in adolescents with a risk of obesity as many as 7 times higher than parents with low education levels.

Parental education is a reflection of parents’ knowledge, attitudes and behavior in maintaining a healthy lifestyle for their adolescents (Falese et al., 2021). The systematic review and meta-analysis study by Laird et al. (2016) explained that parental involvement play a fundamental role in adopting and maintaining the active lifestyle either in the school setting or in the home. Parents with high education will give their support, availability and encouragement to monitor adolescents's physical activity. All
of that are critical factors that influence adolescents's attitude towards physical activity (Santos et al., 2023).

Sekulic et al. (2021) also found that parental education is the most affected factor toward physical activity in late adolescence with the OR of the initial measurement being 1.42 and the OR of the final measurement being 1.23. According to this study, that could happen because parents with a high educational background know the benefits of physical activity for health and they also practice this for themselves and motivate their families to do that. Highly educated parents also take the initiative to facilitate school-based physical activity for their adolescents and encourage them to be active in extracurricular sports activities, but this is not seen in parents with low education (Polo-Recuero et al., 2023).

The other study by Maric et al. (2020) also found the same results that parental education was the most affected factor toward physical activity behavior in early adolescence, this study shows first OR was 1.38 and the final OR was 1.35. This study assumed that parents as one of the role models and sources that facilitate the adolescents to be involved in sports organizations actively either in school or in out of school. Besides that, the majority of parents with high education levels have high socioeconomic status, so they can pay for adolescents' needs in sports facilities, but parents with low education are unable to do the same things (Nezhad, Rahmati & Nezhad, 2012). Jurczak et al. (2021) explained that health-related behaviors, such as physical activity was determined by family’s economic status. This study proved that students from families with higher socio-economic status displayed a higher level of physical activity, highly educated parents engaged their adolescent in physical activity 4-7 times a week than parents with lower education (22.64% vs 9.93%; p<0.05).

Based on the explanation above from the previous study and this study’s results, we can assume that the majority of highly educated parents have a high economic status, where the higher the economic status, the higher their activity. It should be noted that people who have a high economic status have a low level of physical activity. It was compared to lower economies, at a low economic level, survival requires hard work whose activities exceed those of people with a higher economic status.

The other study argues that it is necessary to improve the provision of health education for parents about the importance of physical activity in adolescents. That is because the result shows that parents are the subjects who have the most influence on whether adolescents have high or low physical activity. This study also explains that it is recommended for public agents at the ministry, national, school and regional levels to develop health promotion interventions about the importance of physical activity for all adolescents' parents to increase parents' insight into this information and pass it into their adolescents (Putri, Asniar & Tahlil, 2023).

Meanwhile, a family social support, study by Khan et al. (2020) found that there was a significant relationship between parental support and adolescent’s physical activity. Youth physical activity habits are shaped by their parent’s support. This is because parents can be role models by setting an example that regular exercise can improve body fitness, prevent sedentary lifestyles such as limiting time watching television and playing gadgets, facilitate more care and spend more time doing sports together, especially during weekends. Then, parents' support toward adolescents' physical activity can also by prevent sedentary activity behavior such as passive transportation to school. For example, encouraging their adolescents to walk or facilitate the bicycle to school (Ha et al., 2019).

Then, Pluta et al. (2020) also found that peer support is important for adolescent physical activity. Because adolescence is a period of life in which peer relationships become increasingly important. Adolescents have a greater likelihood of taking risks when they are with peers, so peer support is more strongly related to the level of physical activity in adolescents (Knoll et al., 2015). The higher of peer support could increase the higher of adolescents' enjoyment of physical activity, peer support could promote adolescents' exercise adherence. Self-efficacy and self-regulation are mediating factors of peer support on exercise adherence in adolescents, self-regulation as well as self-efficacy-imposed chain-mediating effects on peer support and adolescents’ exercise adherence (Zou et al., 2023).

Based on this study, parental education is the most affected factor toward physical activity in adolescents with a risk of obesity in rural Aceh. The majority of respondents have parents with low education and also have socio-economic status in the low category. The unstable finances make the respondent’s parents show less attention to the health-related behaviours of adolescents and allow them to get sedentary behavior. It was proven by this study's findings that the participation of adolescents in extracurricular physical activity at school in the not involved category of as many as 87 adolescents (64.9%). It could occur because their parents are unable to facilitate adolescents’ daily physical activity and spend time to do sports together (Ricci et al., 2020).

**Conclusion**

Based on the results, the conclusion of this study is the parental education was a strongest factor that affected physical activity in adolescents with risk of obesity in rural Aceh. It is suggested for the next researcher to assess the other determinants such as self-efficacy and body image towards physical activity in adolescents or conduct further research with a qualitative design.
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References


