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Sedentary Lifestyle and the Threat of Obesity Among Young People

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ABSTRACT
Sedentary lifestyle has become a global issue that has an increasingly significant impact, especially among teenagers. Technological advances and social changes have led to an increase in time spent on activities that require minimal physical movement, such as watching television, playing games, and using electronic devices. This phenomenon is correlated with the increasing prevalence of obesity at a young age, which is one of the main risk factors for chronic diseases such as type 2 diabetes, hypertension, and cardiovascular disease. This study aims to explore the relationship between sedentary lifestyle and obesity among adolescents, as well as identify the drivers of these behaviors. The research method used is literature study (library research) with a qualitative approach. Data was collected from various scientific journals, books, and official reports published in the last five years (2019-2024). The data analysis technique applied is content analysis to identify themes and patterns related to sedentary lifestyle and obesity. The results showed that the duration of high sedentary activity correlated with an increased risk of obesity by up to 30% in adolescents. Environmental, social, and technological factors play a major role in driving sedentary behavior. Early intervention involving increased physical activity, nutrition education, and public health policies can be an effective solution in reducing the risk of obesity among adolescents.

1. INTRODUCTION

Sedentary lifestyles have become an increasingly worrying global phenomenon, especially among teenagers. In the last decade, technological developments and changes in daily activity patterns have driven an increase in sedentary behaviors, such as playing games, watching television, and excessive use of electronic devices (Park et al., 2020). Data from the WHO (2021) shows that more than 80% of adolescents worldwide do not reach the recommended levels of physical activity, resulting in an increased risk of obesity and other non-communicable diseases. This lifestyle not only affects physical health, but also has an impact on the mental and social well-being of adolescents (Mahdavi & Kelishadi, 2020).

A sedentary lifestyle refers to a lifestyle with a lack of physical activity and a lot of time spent sitting or lying down, such as watching television, working in front of a computer, or using gadgets for a long time. According to

research by Park et al. (2020), this lifestyle contributes to various health problems such as obesity, cardiovascular disease, type 2 diabetes, and mental disorders. During the COVID-19 pandemic, an increase in sedentary activity was reported due to many individuals working from home and reduced daily physical activity. This strengthens the correlation between prolonged sitting duration and the risk of various chronic diseases.

In response to these risks, increasing regular light physical activity, such as walking or stretching every hour, can significantly reduce the negative impact of a sedentary lifestyle (Bakker et al., 2021). Lakerveld et al. (2020) also emphasized the importance of public health policies that promote an active lifestyle at work and at home. For example, the use of standing desks or the integration of physical activities into daily work routines. Public awareness of the impact of sedentary lifestyle and education about the benefits of physical activity are important steps in preventing long-term adverse effects (Lakerveld et al., 2020).

In Indonesia, the trend of sedentary lifestyle among teenagers is increasing, along with increasing access to technology and changes in urban lifestyles. A study conducted by the Ministry of Health of the Republic of Indonesia (2022) found that the prevalence of adolescents who spend more than three hours per day on sedentary activities increased from 31% in 2015 to 43% in 2022. This surge has contributed significantly to the increase in obesity rates among adolescents, which is one of the main risk factors for heart disease, diabetes, and other metabolic disorders.

Adolescence is a crucial phase in individual development, where the habits formed can have a long-term impact on health in adulthood (Owen et al., 2020). Therefore, it is important to understand the factors that contribute to the increase in sedentary lifestyle and obesity among adolescents as well as develop effective strategies to encourage higher physical activity (Caroppo et al., 2021). With the increasing prevalence of obesity at a young age, appropriate prevention efforts and interventions are urgently needed to reduce these negative impacts (Saunders et al., 2020).

The increasing prevalence of obesity in adolescents triggered by a sedentary lifestyle can have a serious impact on long-term health and increase the risk of chronic disease in the future (Lewis et al., 2021). Early intervention that focuses on behavioural change and promotion of physical activity is essential to prevent further complications. This study aims to provide a comprehensive overview of the factors that affect sedentary lifestyles as well as offer practical solutions that can be implemented in the daily lives of adolescents.

Several previous studies have highlighted the relationship between sedentary lifestyle and obesity in various age groups. Park et al. (2020) found that high duration of sedentary activity was associated with an increased risk of obesity by up to 30% in adolescents. Mahdavi and Kelishadi (2020) in their study showed that during the COVID-19 pandemic, adolescent physical activity decreased drastically, while time spent on sedentary activity increased, thus worsening obesity rates. Another study by Owen et al. (2020) identified that adolescents who have sedentary habits tend to have a higher body mass index (BMI) compared to those who have better levels of physical activity.

This study aims to identify the relationship between sedentary lifestyle and obesity among adolescents in Indonesia. In addition, this study

aims to analyze the factors that drive sedentary behavior, explore its impact on health, and provide strategic recommendations in efforts to prevent obesity through increased physical activity and promotion of a healthy lifestyle.

2. METHOD

This study uses a qualitative approach with a library research method which aims to identify and analyze the relationship between sedentary lifestyle and the threat of obesity among adolescents. Literature studies are chosen because they allow researchers to explore various previous studies and gain an in-depth understanding of the topic being studied (Creswell & Creswell, 2017). This approach is also relevant in collecting and analyzing data from a variety of readily available scientific sources, thus providing a strong theoretical foundation in understanding complex phenomena such as obesity and sedentary lifestyles (Merriam & Tisdell, 2015).

The data sources in this study come from journal articles, books, research reports, and official publications from health organizations such as the World Health Organization (WHO) and the Ministry of Health of the Republic of Indonesia. Researchers accessed journals published in the last five years (2019-2024) to ensure that the data collected were up-to-date and relevant to the latest developments in adolescent health. The databases used include PubMed, ScienceDirect, Google Scholar, and ProQuest, which are known for having a collection of credible scientific journals and publications.

The data collection technique used is document review, where researchers identify, classify, and review relevant research articles and reports with a primary focus on the impact of sedentary lifestyle on adolescent obesity. This process involves searching using keywords such as "sedentary lifestyle," "teen obesity," and "teen physical activity." Inclusion criteria in data collection included articles discussing the relationship between sedentary lifestyle and obesity among adolescents, while exclusion criteria were studies that did not focus on adolescent age groups or were irrelevant to the purpose of the study.

The data analysis method used is content analysis, which aims to identify patterns, themes, and relationships that arise from the data that has been collected. Researchers group the data based on specific categories, such as factors that cause sedentary lifestyles, impacts on physical health, and obesity prevention strategies. The data obtained are then critically analyzed to identify research gaps and provide a comprehensive synthesis that can answer the formulation of the problem and achieve the research objectives (Bowen, 2009). This analysis process is carried out iteratively, allowing researchers to conduct in-depth reflection on each finding produced from various data sources.

By using this method, the research is expected to make a significant contribution to understanding the phenomenon of sedentary lifestyle and obesity among adolescents, as well as provide a theoretical basis for the development of effective intervention programs in the future.

3. RESULT AND DISCUSSION

The following is a table containing a summary of 10 selected articles from various studies related to sedentary lifestyle and the threat of obesity among adolescents. These articles are selected based on relevance, thematic scope, and research methods used. Each article contributes to understanding the impact of sedentary lifestyle

on obesity, the risk factors involved, and recommended prevention strategies.

Table 1. literature review

No	Author	Title	Key Findings
1	An, R., Shen, J., Yang, Q. (2019)	Impact of built environment on physical activity and obesity among adolescents	The relationship between the physical environment and obesity in adolescents
2	Park, J. H., Moon, J. H. (2020)	Sedentary lifestyle: overview of updated evidence of health risks	Impact of sedentary lifestyle on health
3	Kansra, A. R., Lakkunarajah, S. (2021)	Childhood and adolescent obesity: a review	Overview of adolescent obesity and its relationship to lifestyle
4	Jebeile, H., Kelly, A. S. (2022)	Obesity in children and adolescents: causes and management	Risk factors and obesity management
5	Vandoni, M., Codella, R. (2021)	Combatting sedentary behaviors in children with obesity during COVID-19	Physical activity intervention in obese adolescents
6	Psaltopoulou, T. (2019)	Prevention and treatment of adolescent obesity	Prevention and treatment of adolescent obesity
7	Gómez, S. F., Wärnberg, J. (2020)	Study protocol of PASOS study on youth obesity	Population study on adolescent obesity in Spain
8	Mateo-Orcajada, A. (2022)	Differences in physical fitness between active and sedentary adolescents	Differences in active and sedentary adolescent body composition
9	Cardel, M. I., Atkinson, M. A. (2020)	Obesity treatment among adolescents	Adolescent obesity intervention approach
10	Coimbra, D. R. (2021)	Physical activity, sedentary behavior and adolescent lifestyle	The role of physical activity in adolescent lifestyle

Research on sedentary lifestyle and obesity in adolescents has received increasing attention in recent years as the prevalence of obesity among children and adolescents in various countries increases. The articles summarized in the table above reflect the efforts of various researchers to understand the relationship between a sedentary lifestyle and the risk of obesity, as well as to find effective solutions to address this problem.

An article written by An, Shen, and Yang (2019) highlights how the physical environment, such as public facilities and the availability of open spaces, affects the physical activity of adolescents. In this study, researchers found that urban environments with minimal green space and sports facilities tended to encourage sedentary behavior, which contributed to an increased risk of obesity. They also emphasized the importance of child- and adolescent-friendly urban planning to promote physical activity as part of daily routines. These findings are in line with other studies that state that environment-based interventions have a significant impact on

reducing obesity rates among adolescents (An et al., 2019).

Park et al. (2020) in their article provide a comprehensive overview of the various health risks associated with sedentary lifestyles. This article not only discusses obesity but also its broader implications for cardiovascular and mental health. Park et al. highlighted how excessive use of gadgets, television, and video games increased sitting time and decreased physical activity time. They also highlighted the impact of the COVID-19 pandemic which has further exacerbated sedentary habits among adolescents due to mobility limitations and distance learning.

Kansra, Lakkunarajah, and Jay (2021) examined various factors that contribute to adolescent obesity, including unhealthy diets, lack of physical activity, and psychosocial factors. They highlight how academic and social pressures encourage teens to spend more time in front of screens, thereby increasing the risk of obesity. This article also provides an in-depth analysis of the importance of early intervention and the role of the family in forming healthy habits. They assert that an approach that involves communities, schools, and families is the most effective strategy in reducing the prevalence of obesity among adolescents (Kansra et al., 2021).

An article from Jebeile et al. (2022) in the journal The Lancet highlights the main causes of obesity in adolescents and applicable management strategies. They explain that obesity is not only the result of a lack of physical activity, but is also influenced by genetic and environmental factors. The study also discusses a holistic therapeutic approach that involves dietary changes, increased physical activity, and psychological support. Interestingly, they emphasize that a successful obesity management program must take into account social and economic factors that affect adolescent eating habits and activities (Jebeile et al., 2022).

Vandoni and Codella (2021) focused on intervention strategies during the COVID-19 pandemic, which have exacerbated sedentary habits among adolescents. In this article, they evaluate the effectiveness of a distance sports program designed specifically for children and adolescents with obesity. The results of their study showed that the program helped reduce weight and improve physical fitness, even though it was done in an online format. These findings provide valuable insights into how technology can be used to promote physical activity among adolescents isolated due to the pandemic situation (Vandoni et al., 2021).

Psaltopoulou et al. (2019) in their study reviewed various methods of prevention and treatment of adolescent obesity, emphasizing the importance of a combination of nutrition education, regular physical activity, and medical interventions. They highlight the important role schools play in promoting healthy lifestyles and how sustainable physical education programs can help lower the prevalence of obesity. In addition, this article emphasizes that public health policies should prioritize obesity prevention efforts from an early age to prevent more serious health problems later in life (Psaltopoulou et al., 2019).

Gómez et al. (2020) in the PASOS population study they conducted in Spain, analyzed physical and sedentary activity patterns among adolescents. They found that more than 60% of teens spent more than three hours a day on sedentary activity, which significantly increased the risk of obesity. The study provides policy recommendations to improve sports facilities in schools and introduce physical activity programs as part of the daily curriculum (Gómez et al.,

2020).

Mateo-Orcajada et al. (2022) in their review found that adolescents who had an active lifestyle showed a healthier body composition compared to those who had sedentary habits. This article provides strong evidence regarding the benefits of regular physical activity in reducing the risk of obesity and improving overall health (Mateo-Orcajada et al., 2022).

Cardel et al. (2020) in an article published in JAMA Pediatrics discuss different forms of interventions to address adolescent obesity, including behavioral, pharmacological and surgical therapies. They highlight that community-based approaches have a greater impact in the long run compared to individual interventions. This article also highlights the importance of parental involvement in adolescent weight loss programs (Cardel et al., 2020).

Finally, Coimbra et al. (2021) in their study published in PLoS One used a latent class analysis method to evaluate the factors that contribute to sedentary lifestyle among adolescents. They found that adolescent girls tended to have a higher sedentary time compared to adolescent boys, and regular physical activity had a protective effect against obesity (Miranda et al., 2021).

Overall, these articles provide valuable insights into the factors that influence obesity among adolescents and strategies that can be implemented to reduce the negative impact of a sedentary lifestyle. This study confirms that a multidisciplinary approach involving individuals, families, schools, and communities is key to effectively managing adolescent obesity.

Discussion

The Relationship between Sedentary Lifestyle and Obesity Among Adolescents

A sedentary lifestyle refers to habits or activities that require minimal physical movement, such as watching television, playing video games, using gadgets, and sitting for long periods of time. Research shows that teens who spend more than 3 hours a day in sedentary activity have a higher risk of obesity compared to more physically active teens.

Obesity among adolescents occurs when the energy consumed from food exceeds the energy expended through physical activity. A sedentary lifestyle exacerbates this energy imbalance, leading to the accumulation of excess body fat.

This relationship can be explained through several mechanisms:

1. Decreased Calorie Burning: Minimal physical activity causes the body to burn fewer calories, so unused calories are stored in the form of fat.
2. Increased Calorie Consumption: Sedentary activity is often associated with the habit of snacking on high-calorie, low-nutrient-dense foods.
3. Metabolic Disorders: Lack of physical activity contributes to insulin resistance, which is a major risk factor for obesity.

Factors Driving Sedentary Behavior

Various factors contribute to the increase in sedentary behavior among Indonesian adolescents. These factors include:

1. Technology and Digitalization:
   Technological advances make it easier to access entertainment and learning digitally, so teenagers spend more time in front of screens.
2. Transportation Availability:
   The increasing use of motor vehicles even for short distances reduces the chances of teenagers walking or cycling.

3. School and Home Environment:
   A learning environment that tends to be passive (sitting in class for hours) and a lack of adequate sports facilities in schools and neighborhoods.
4. Habits and Parenting:
   Parents who have a sedentary lifestyle tend to pass on the same lifestyle to their children.
5. Social and Cultural Changes:
   There is a change in the way adolescents socialize, where social interaction is more done through social media than outdoor physical activities.

The Impact of Sedentary Lifestyle on Health

The impact of a sedentary lifestyle on adolescents is not only limited to weight gain, but also raises a variety of long-term health problems, such as:

1. Obesity and Metabolic Complications:
   Obesity increases the risk of metabolic diseases such as type 2 diabetes, hypertension, and dyslipidemia.
2. Cardiovascular Disorders:
   Lack of physical activity is directly related to the risk of heart disease in adulthood.
3. Psychological Disorders:
   Adolescents with obesity often experience decreased self-confidence, stress, and depression.
4. Orthopedic Problems:
   Being overweight puts excess pressure on the joints, which can lead to musculoskeletal disorders.

4. CONCLUSION

This study confirms that sedentary lifestyle has a significant impact on the increase in obesity rates among adolescents. The duration of physical activity with minimal physical movement, such as sitting for long periods of time, contributes greatly to energy imbalances that lead to the accumulation of body fat. In addition, technological factors, parenting, and urban environments exacerbate the tendency of adolescents to lead a sedentary life. If left unchecked, this lifestyle can increase the risk of various chronic diseases in the future and reduce the quality of life of adolescents.

As a suggestion, holistic and integrated intervention efforts are needed to reduce the negative impact of sedentary lifestyles. Educational programs that emphasize the importance of regular physical activity should be integrated into the school curriculum. In addition, governments and educational institutions need to provide adequate sports facilities and encourage physical activity in school and community environments. Families also have an important role to play in forming healthy habits through example and support for physical activity at home. With these measures, it is hoped that the prevalence of adolescent obesity can be suppressed, thereby creating a healthier and more productive young generation in the future.

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