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COMPARATIVE STUDY: HEALTH RISK BEHAVIOUR IN URBAN AND RURAL INDONESIAN ADOLESCENTS

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ABSTRACT

Introduction: In 2019, the prevalence of cigarette smoking among adolescents in Indonesia increased to 18.8%. **Aim**: To assess health risk behaviours among Indonesian students in both urban and rural areas. **Methods:** This study's survey items, were developed using items questionnaire that focuses on smoking, eating, socioeconomic status (SES), and social relationships among teenagers aged 14 to 18. The study used two separate, demographically and culturally varied school-based populations**. Results:** The study found that teenagers in urban areas were more likely to smoke cigarettes, whilst adolescents in rural areas were more likely to practice healthy eating habits. Significant disparities in socioeconomic level (P 0.05) and social interactions (P 0.05) were also discovered, which may have an impact on the health risk behaviours seen in teenagers. The development of focused therapies and public health initiatives to address teenage health risk behaviours will benefit from these findings. **Conclusion:** More study is necessary to further understand the relationship between risk factors and health behaviours in both urban and rural teenagers in Indonesia. This will make it possible to find efficient preventive techniques and plans adapted to pupils' particular environments and cultural backgrounds.

Keywords: health risk behaviour, adolescents, eating behaviour, smoking behaviour

INTRODUCTION

The transitional stage between childhood and maturity is known as adolescence. It is a necessary time to research different facets of human behaviour, including health risk behaviours (Brooks et al., 2012; York et al., 2010), as it is a time of rapid physical, cognitive, emotional, and social transformation. The different dimensions of human behaviour, with health risk habits at the forefront, are explored in great detail throughout this phase. Understanding these adolescent behaviours is of utmost importance because they significantly impact physical and mental health. Notably, adolescence marks a formative chapter where behaviours and habits instilled during this period can leave enduring imprints on health and overall wellbeing throughout adulthood (Bonino et al., 2005; Sawyer et al., 2012) . Delving into the health risk behaviours among adolescents unveils a rich tapestry of insights. It provides a window into the multifaceted factors contributing to positive or negative health outcomes. It equips us with the tools to develop targeted interventions and strategies to foster healthier behaviours among this vulnerable demographic. Scrutinising these risk behaviours offers a profound understanding of the motivating forces and influences at play, empowering us to design precise interventions that can help mitigate potential harm.

Like many countries, Indonesia grapples with the escalating prevalence of health risk behaviours among adolescents. The statistics tell a compelling story, with most cigarette smoking among Indonesian adolescents aged 13-15 years old soaring to 40% in 2019 (UNICEF, 2020). In two

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decades, smoking prevalence among youth has multiplied more than fourfold, a staggering statistic (Dartanto et al., 2018). Unhealthy eating behaviours are another pressing concern within the Indonesian adolescent population. It is been observed that economic factors drive 40% of adolescents to consume a narrower variety of foods, while 30% consume less essential dietary components like eggs and plant-based proteins (UNICEF, 2020).

The prevalence and nature of these behaviours may vary between rural and urban areas due to distinct socio-cultural, economic, and environmental factors shaping adolescents' lives in these settings. In rural areas, adolescents often face unique challenges and opportunities that can impact their health risk behaviour (Curtis et al., 2011). Specific risk behaviours, such as tobacco use and dietary habits, may be influenced by restricted access to healthcare services, that make fewer opportunities to receive preventive programmes, for example smoke cessation programmes and nutritional counselling, a lower socioeconomic position, and a lack of social infrastructure. Contrarily, urban environments offer a unique mix of conditions that can affect teenagers' risky health behaviours. Urban environments are characterised by higher population densities, more media exposure, various social networks, and easier access to recreational resources. These elements may influence habits like smoking and eating preferences (Haye et al., 2014; Nurwanti et al., 2019).

As it has far-reaching implications for public health and wellbeing, the complex interplay of health risk behaviours among teenagers living in rural and urban settings has gained increasing relevance as a research topic. It is crucial to comprehend these disparities to create successful preventative measures and the design of tailored interventions. Researchers and policymakers can learn essential lessons about the varied difficulties and particular needs of teenagers in rural and urban locations by thoroughly examining the frequency, drivers, and effects of health risk behaviours in these different contexts.

This study is purposefully designed to offer a panoramic view of adolescents' current health risk behaviours in rural and urban settings. By amalgamating and synthesising the findings from our investigations, we endeavour to discern prevalent patterns, illuminate existing disparities, and delve into the diverse factors that potentially contribute to the observed variations. Notably, this research is particularly significant for Indonesia, where a conspicuous absence of studies addressing health risk behaviours and their influencing determinants among Indonesian adolescents exists. Consequently, this study emerges as a pioneering effort to bridge this knowledge gap and add to the existing body of research.

In essence, the overarching goal of this study is to provide a foundation for a more profound comprehension of the distinctive dynamics governing health risk behaviours among adolescents in rural and urban areas. These differences can profoundly impact the health behaviours, making it crucial to study them separately. While many studies have focused on general population. Our study specifically examines on adolescents. Policymakers and practitioners can develop interventions grounded in empirical evidence by identifying and elucidating the key factors that influence these behaviours. These interventions will be thoughtfully tailored to address adolescents' specific needs and challenges in these diverse settings, ultimately propelling their overall health and wellbeing to the forefront of the public health agenda.

METHODS

Study Design and Participants

The research was carried out in May-October 2022, marking a

contemporary and up-to-date investigation into the health behaviours of Indonesian adolescents. The dataset utilised in this study was collected through a cross-sectional survey administered to junior and senior school children hailing from both urban and rural regions of Banten, Indonesia.

Due to the pandemic, the survey was conducted using Google Forms and distributed through teachers in selected schools registered in health services in urban and rural areas with the assistance of school representatives, following the school's policy. With the time given the school representatives were distributed to students with suitable with the age criteria. This method was chosen to ensure the safety and accessibility of participants during the pandemic. Even though this approach did not yield the level of participation we anticipated, but the response rate is 60%, which is still acceptable with similar study.

In the urban setting, the survey was conducted in a prominent metropolitan city within the Tangerang region of Banten, Indonesia, which shares a geographical border with the nation's capital, Jakarta. Sixty school-aged students between 14-18 years old willingly participated in the study. This urban school served as the primary site for data collection. 60 school-aged students between 14 and 18 years old willingly participated in the study. Among the participants, approximately 36.6% (n = 22) were identified as male, while the remaining 63.4% (n = 38) were female, reflecting a diverse and balanced representation.

The rural school, on the other hand, was located in Lebak, a sizable subdistrict with various landscapes, including lowlands, mountains, and coastal regions. This school, around 64.5 kilometres from Tangerang City, was the leading site for data collection in the rural area. In total, 60 students between 14 and 18 took the survey. The sample had an attractive gender distribution, with male students making up 73.3% (n = 44) and female students making up the remaining 26.7% (n = 16).

A comprehensive picture of teens' health practices in varied environmental contexts is offered by carefully choosing urban and rural schools for data collection. It is crucial to have a solid understanding of the research's environment and the unique demographics of each region.

Measurements

A survey tool was created especially for the study's purpose of learning more about adolescents' food and smoking habits. The questionnaire was thorough and included questions on eating and smoking habits. Aside from that, it had two queries meant to gauge the socioeconomic and social standing of the participating adolescents. These two variables were chosen because the literature review showed a close relation with the health risk behaviour in adolescents. These factors included socioeconomic status, social relationships (including family dynamics), and the adolescents' access to health information through various media channels.

To validate the survey instrument, a sample of 30 individuals was selected from diverse rural and urban areas adjacent to the primary survey location. The validation process confirmed the questionnaire's reliability and internal consistency, as indicated by a Cronbach's alpha coefficient exceeding 0.08. This robust validation process ensured the survey instrument's effectiveness in accurately measuring and assessing the variables under investigation.

This school-based survey primarily targeted students aged 14 to 18 years. Due to the pandemic, the survey was conducted using Google Forms and distributed through teachers in selected schools registered in health services with the assistance of school representatives, following the school's policy. The validated anonymous questionnaire

included items related to crucial health behaviours and protective factors among students, forming the core modules of the survey. Prior to completing the questionnaire, both parents and students were required to provide their informed consent. Before participating in the survey, the teachers were giving written instructions emphasising that the study was anonymous and that they should not include their names to the parents of the students. They were also informed that their participation was voluntary and would not impact their academic standing or school status.

Smoking Behaviour

The smoking behaviour was analysed from computing three questions that obtained from the following questions: Have you ever smoked cigarettes, Have you ever smoked shisha? or Have you ever smoked electronic cigarettes? The answers were coded 2 for "Yes" and 1 for "No".

Eating Behaviour

Eating behaviour was analysed from data obtained from the following questions within the questionnaire: Do you usually have breakfast? Do you consume fruit every day? Do you consume vegetables every day? Do you consume sweet snack every day? Do you consume soft drink every day? The variables were scored as follows: Yes=2 and No=1 for breakfast, milk, fruit, and vegetables; Yes=1 and No=2 for sweet snacks and soft drinks.

Socioeconomic Status (SES)

Socioeconomic status was analysed from data obtained from the following questions within the questionnaire: Do your father work? Does your mother work? Do you have a private car? Do you have your own bedroom? Do you have a computer or laptop? Have you had family vacation within the last 12 months? These questions showed the economic status of the participant by computing the score: 2= Yes and 1=No for each question.

Social Relationship

Social relationships were analysed from data obtained from the following questions within the questionnaire: Do you often after-school time spent with friends? Do you often spend time at night with friends? Do you often spend the time online chat or using the internet? These questions aimed to capture various dimensions of social interaction, encompassing in-person gatherings and digital communication, thereby providing a comprehensive understanding of the participation's social engagements and relationships. Each score was coded 1 for "No" and 2 for "Yes". The combined responses offered insight into the frequency and modality of adolescents' social connectivity, which may influence behavioural and emotional outcomes."

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 22. $P<0.05$ was considered statistically significant. Subsequently, all participants' socio-demographic, risk factor and health behavioural data, including smoking and eating behaviour data, were compared between rural and urban adolescents using T-test after the data were found to be distributed normally. The variables were calculated using the score from each item in the questionnaire. A T-test was applied to the variables and each item question to examine the discrepancies distribution in urban and rural setting. This approach allowed for a detailed comparison of behavioural patterns and potential socio-environmental influences unique to each geographic context.

The authors of this study have fully complied with ethical considerations, including but not limited to plagiarism, informed consent, misconduct, data fabrication and/or falsification, double

publication and/or submission, and redundancy. These ethical principles have been strictly adhered to throughout the research process. This study was part of a larger research project on adolescent health behaviour in Banten, which aimed to explore various risk and protective factors influencing youth health outcomes, and has passed the ethical review from the ethics committee of Universitas Esa Unggul with reference number 0922-07.033/DPKE-KEP/FINAL-EA/UEU/VII/2022.

RESULTS

Table 1. Differentiation of Health Risk Behaviour in Adolescents in Rural and Urban Area

Variable	Rural Mean (SD)	Urban Mean (SD)	N (per group)	P-Value
Smoking	4.30 (1.430)	5.70 (0.908)	60	0.000
Eating behaviour	9.67 (0.696)	7.48 (2.515)	60	0.003
Socioeconomic status (SES)	8.55 (1.383)	9.48 (1.372)	60	0.000
Social Relation	4.76 (0.621)	5.30 (0.646)	60	0.000

The statistical analysis revealed smoking behaviour was more common in urban area compared to rural areas with p-value of 0.000 ($p<0.05$). A significant p-value of 0.003 ($p<0.05$) was observed for the eating behaviour variable, demonstrating that the eating behaviour was slightly healthier in rural locations. The statistical analysis in socioeconomic status showed that urban areas had a higher status compared to rural areas ($p<0.05$). A p-value of 0.000 ($P<0.05$) was obtained for the social relation, demonstrating a significant difference in social characteristics between rural and urban locations, with urban areas having higher score.

Table 2. Differentiation of the Items of Questionnaire in Adolescents in Rural and Urban Area

Variable	Rural Mean (SD)	Urban Mean (SD)	N (Per group)	P-Value
Have you ever used tobacco products?	1.40 (0.494	1.90 (0.303)	60	0.000
Have you ever smoked shisha?	1.40 (0.494)	1.90 (0.303)	60	0.000
Have you ever smoked electronic cigarettes?	1.50 (0.504)	1.90 (0.303)	60	0.000
Do you eat breakfast every day?	1.98 (0.198)	1.55 (0.502)	60	0.000
Do you consume fruit every day?	2 (0.000)	1.88 (0.127)	60	0.002
Do you consume vegetables every day?	1.96 (0.197)	1.68 (0.462)	60	0.000
Do you consume	1.82 (0.389)	1.67 (0.522)	60	0.000

Variable	Rural Mean (SD)	Urban Mean (SD)	N (Per group)	P-Value
sweet snacks every day?				
Do you consume soft drink everyday	1.91 (0.191)	1.6 (0.501)	60	0.000
Does your father have a job?	1.67 (0.475)	1.77 (0.427)	60	0.224
Does your mother have a job?	1.27 (0.446)	1.40 (0.494)	60	0.117
Do you have a private car in your family?	1.20 (0.403)	1.38 (0.490)	60	0.027
Do you have a bedroom of your own?	1.78 (0.415)	1.77 (0.427)	60	0.843
Within 12 months, did you take a family vacation?	1.50 (0.504)	1.78 (0.415)	60	0.01
Do you own a computer or laptop?	1.13 (0.343)	1.38 (0.490)	60	0.001
Do you often after-school time spent with friends?	1.50 (0.504)	1.82 (0.390)	60	0.001
Do you often spend time at night with friends?	1.48 (0.504)	1.65 (0.481)	60	0.040
Do you often spend the time online chat or using the internet?	1.78 (0.415)	1.83 (0.376)	60	0.471

The results show substantial differences between teenagers from rural and urban areas in several areas, including eating and smoking habits ($P<0.05$). A laptop, a family car, and the frequency of family trips are examples of socioeconomic indicators that also revealed significant differences ($P<0.05$). There were also substantial differences in social interactions, with adolescents in rural areas spending less time with their peers after school and at night than those in urban areas ($P<0.05$). How youth from rural and urban regions received health information from medical professionals also showed significant disparities ($P<0.05$). These findings highlight the persistent structural inequalities in access to resources and opportunities that shape

adolescents' health behaviours across different geographical settings.

DISCUSSION

This study's main objective was to compare adolescents' health risk behaviours in Indonesia's rural and urban areas. As there is little information on sexual activity and alcohol usage, the study specifically looked at smoking and eating habits. Questions about sexual conduct can be unsettling due to the stigma attached to the topic and typically generate few honest and open responses. The study specialises in eating and smoking habits because they can provide crucial insights into the patterns of health-risk behaviour among young people in rural and urban areas. The prevalence of smoking and the consumption of fruits and vegetables in urban and rural areas were strongly correlated in this study.

Smoking Behaviour

The study's findings show that adolescents who live in cities are more likely to smoke. These results are in contrast to earlier studies that suggested a higher prevalence of teen smoking in rural areas, which they attributed to things like lower recall of anti-tobacco messages (Kim & Selya, 2022), increased susceptibility to tobacco (Roberts et al., 2020), and laxer enforcement of anti-tobacco laws in rural areas (York et al., 2010). This did not appear to be the case in Indonesia because there was no anti-tobacco advertising enforcement in urban areas, which would have reduced the prevalence of teen smokers there compared to rural areas.

As seen in this study, the higher incidence of smoking in metropolitan regions can be ascribed to several reasons that are more prevalent there. Urban adolescents' increased exposure to tobacco marketing is one significant element (Choi et al., 2002; Nurhayati et al., 2022). Urban people are the target audience for these advertising initiatives, which use various marketing techniques to give smoking a favourable reputation. This survey also showed it to be statistically significant (P 0.05) that adolescents living in metropolitan areas were likelier to own laptops. Thanks to this access to personal computers, they have easier access to tobacco commercials and events funded by cigarette corporations.

In essence, the urban environment makes it more likely for teenagers to be exposed to pro-smoking messaging in advertising, and the fact that they own personal laptops makes it easier for them to interact with such content and marketing initiatives. This increased exposure may cause the higher prevalence of smoking and other tobacco-related behaviours among urban youths.

Accessibility to cigarette merchants is another essential factor influencing smoking behaviour in urban settings (Hoe et al., 2022; Leatherdale & Strath, 2007). Some urban areas typically have strong enforcement of tobacco control policies, such as smoke-free zones in office, restaurants, and public transport, and greater exposure to media anti-smoking messages, which can reduce smoking uptake. Rural areas might lag in enforcement, making smoking more socially acceptable. This urban–rural gap is echoed in other countries; for example, National survey data in 2015 found that 27.9% of adults in rural Malaysia were current smokers, versus 21.2% in urban areas (Lim et al., 2018). Malaysia has implemented many tobacco control measures (bans on advertising), graphic health warning on packs (also in Indonesia), tobacco taxes, etc.), under its Control of Tobacco Product Regulations. Indonesia, while not a signatory to the WHO Framework Convention on Tobacco Control for many years, has gradually introduced some controls, for instance, a 2012 law established smoke-free public places, pictorial park warning, and partial

advertising restrictions (Megatsari et al., 2023).

However, these policies in Indonesia are less uniform; tobacco advertising is still visible in certain media and regions, and cigarette prices remain relatively affordable despite annual tax hikes (Megatsari et al., 2023). In Malaysia, by contrast, stronger regulation is evident and even plans for a "General End Game" Law (banning sales to anyone born after 2007) have been discussed to eventually phase out smoking (Dyer, 2022). Nevertheless, both countries face challenges in curbing tobacco use, as ingrained habits and industry influence can undermine policy impact. Ongoing efforts, from public education to stricter enforcement are crucial to address the urban-rural smoking particularly in adolescents.

The study's results also showed that urban adolescents' higher socioeconomic position is essential to the equation. In urban areas, adolescents often find cigarettes more affordable, the higher their social position. By removing one of the financial obstacles that would have prevented urban youths from buying cigarettes; this financial accessibility increases the prevalence of smoking among young people. Apart from the economic status, lower education level is also associated with higher smoking rates. Urban residents in Malaysia are generally more educated and more exposed to anti campaigns, which correlates with lower likelihood of smoking (Lim et al., 2018)

Peer smoking is another element frequently cited as having the most significant influence on adolescents' behaviour (Littlecott et al., 2023; Robalino & Macy, 2018). The data gathered for this study strongly support this idea by showing that teenagers in urban settings are more likely to hang out with their friends after school and at night. This pattern emphasises how simple it is for young people to interact socially and communicate in metropolitan settings. Peer smoking has many different effects. Teen smoking initiation is strongly correlated with the number of smoking peers and the approval of smoking by peers (Mayhew et al., 2000). Furthermore, Nargiso et al. (2012), mentioned that in a high risk sample of adolescents, it was found that peer characteristics would influence smoking outcomes more than family variables.

The presence of crowded areas, schools and community centres in metropolitan settings also encourages youth interaction and socialisation. In urban environments, where peers are easily accessible, social influence, especially peer pressure, can majorly impact habits like smoking (Maxwell, 2002; McMillan et al., 2018). Studies have shown that teenagers are more likely to start smoking if they have friends or acquaintances who smoke, demonstrating the influence of peers on smoking behaviour. Urban regions have a more extensive peer network, which increases the likelihood that a person will run into peers who smoke, increasing exposure and the possible influence on smoking behaviour.

Eating Behaviour

The study also discovered that adolescents from rural areas had healthier eating habits than those from metropolitan ones. Greater access to fresh fruit, proximity to agricultural areas, and cultural values that support healthy eating could all impact how people eat in rural places. Similar results were discovered in another study, which indicated that adolescents in remote rural Scotland consumed vegetables most frequently while consuming sweets and chips the least often (Levin, 2014). In addition, this study revealed a connection between eating habits and socioeconomic position, which we assessed through measures of automobile ownership and family trips. This phenomenon, a nutrition transition with urbanisation, is also found in

Malaysia. Malaysia has seen increased westernisation of urban diets in recent decades (Ramadas et al., 2021). One clear outcome of these dietary differences is in health indicators like overweight and obesity. Urban lifestyles tend to promote higher caloric intake and sedentary behaviour, so obesity rates are generally higher in urban areas. In Malaysia, fast food consumption is prevalent among rural (32.7% once a month), suburban (17.4% at least once a week), and urban (25%, more than four times per month) communities (CodeBlue, 2023).

This study also highlights the connection between eating habits and socioeconomic level, which was determined by elements including automobile ownership and family trips. These imply that both rural and urban adolescents' eating habits may be influenced by the resources available to them and the lifestyle that goes along with their social position.

The stark socioeconomic disparities between adolescents in rural and urban areas, highlighted in this study, shed light on why some teenagers could choose poor dietary options. According to an earlier study (Story & Resnick, 1986; Yoshikawa et al., 2012), this socioeconomic disparity significantly influences how people eat, think, and behave. The quantity of fruits and vegetables at lower prices than those in urban settings in rural areas like Lebak, where agriculture is a significant source of employment (Widiastuti, 2022) gives a strong incentive for better eating choices. Research in Malaysia highlighted that healthy eating is often costlier, putting it "beyond the affordability" of many low-income urban (and rural) households (Ramadas et al., 2021).

The interaction of these variables highlights the nuanced relationship between socioeconomic position, dietary preferences, and the environment surrounding food, emphasising the need for specialised interventions and techniques to encourage better eating among teenagers in rural and urban locations. Malaysia introduced an excise tax on sugary drinks in 2019 (40 sen per litre on drinks with high sugar content), intending to discourage excessive sugar intake and prod manufacturers to reformulate products (Mohd Hanim et al., 2021). Early indications showed public support for this "soda tax" due to its health benefits, and the government has since discussed increasing the rate to further reduce sugar consumption. Such taxes are in line with WHO recommendations to curb obesity by raising the price of sugary drinks by at least 20%. Several other countries in the region (e.g. Thailand, Philippines) have implemented similar SSB taxes, though Indonesia has not yet done so.

Adolescents who live in cities often have a more significant amount of disposable income available to them. They can access and purchase various food options, including some that would be considered less healthful but are frequently marketed as appealing and easily accessible thanks to their financial advantage. Their economic prosperity may have a significant impact on their eating habits. For instance, a study among Chinese teenagers found that consumption of dairy and meals with a Western aesthetic is positively correlated with socioeconomic status (SES) (Shi et al., 2005). Their overall food choices may be impacted by this SES-driven pattern (Vlismas et al., 2009). Additionally, studies have indicated that higher-income households are more likely to buy sugary goods (Murayama, 2015; Perera & Ekanayake, 2011). Many things, including food insecurity, commonly linked to lower socioeconomic status and poverty, may contribute to the availability and prevalence of these sugary foods in urban settings (Angeles-Agdeppa et al., 2021).

In conclusion, due to income inequality and metropolitan surroundings, teenagers are frequently exposed to good

and bad food options. Their general health and wellbeing may be significantly and permanently impacted by this income disparity and the dietary decisions accompanying it. The study's results also shed light on the critical part peer relationships may play in influencing urban adolescents' poor eating habits. Young people in urban settings interact with their peers more regularly than rural ones. Urban adolescents may develop less wholesome eating habits due to the increased peer interaction in urban environments. In fact, adolescents spend more time with their friends, and they become more independent in their eating choices as a result of having more access to money to buy meals on their own (Viner et al., 2012). A possible explanation for the higher frequency of unhealthy eating practices seen in urban environments is the impact of peers on food decisions and behaviour, in addition to the complicated social dynamics and norms that are common there.

According to repeated findings in the literature, teenagers' normative ideas about the eating behaviours of their friends and peers significantly impact how they choose to eat (Salvy et al., 2012). Therefore, peer relationships can substantially impact what urban teenagers decide to eat, contributing to their dietary inclinations. Although this study provides insightful information about the differences in health-related activities between teenagers in rural and urban areas, it is essential to recognise some limitations, particularly concerning sample size. The sample employed in this study may only partially represent Indonesia's diverse population, which has many different facets. However, it's important to stress that the study's conclusions have merit because they highlight the differences in teenagers' health habits in urban and rural environments. These variations have a solid socioeconomic and interpersonal foundation and are of utmost significance to public health professionals.

Despite its limitations, this research establishes the groundwork for a greater understanding of teenage health and provides insights that can be extremely helpful in creating successful intervention programmes. Public health professionals can use these findings to develop treatments specifically tailored to the requirements of teenagers in Indonesia's rural and urban locations. As a result, the study's findings significantly contribute to the body of knowledge expanding on adolescent health, directing both researchers and policymakers. These discoveries will help encourage better practices and lower health risks among teenagers, eventually increasing wellbeing and paving the way for a brighter future for Indonesia's children.

CONCLUSIONS

The results of this study highlight the aim to assess health risk behaviours in rural and urban adolescents, revealing significant differences among Indonesian teenagers residing in these different settings. These differences are intimately related to the wide ranges in their socioeconomic level and interpersonal connections. These findings highlight the need to understand the numerous, intricate aspects affecting adolescents' health behaviour.

These findings are significant because they have the potential to guide the creation of carefully targeted interventions and public health initiatives meant to address health risk behaviours among Indonesian teenage populations. Interventions can be created to be more effective and culturally appropriate by identifying the particular difficulties and factors at play in various contexts.

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REFERENCES

Angeles-Agdeppa, I., Toledo, M. B., & Zamora, J. A. T. (2021). Moderate and Severe Level of Food Insecurity Is Associated with High Calorie-Dense Food Consumption of Filipino Households. *Journal of Nutrition and Metabolism*, *2021*, e5513409. https://doi.org/10.1155/2021/5513409

Bonino, S., Cattelino, E., & Ciairano, S. (2005). Risk Behavior in Adolescence. In E. Cattelino, S. Bonino & S. Ciairano (Eds.), *Adolescents and Risk: Behavior, Functions, and Protective Factors* (pp. 1–31). Springer Milan. https://doi.org/10.1007/88-470-0393-8_1

Brooks, F. M., Magnusson, J., Spencer, N., & Morgan, A. (2012). Adolescent multiple risk behaviour: An asset approach to the role of family, school and community. *Journal of Public Health*, *34*(suppl 1), i48–i56. https://doi.org/10.1093/pubmed/fds001

Choi, W. S., Ahluwalia, J. S., Harris, K. J., & Okuyemi, K. (2002). Progression to established smoking: The influence of tobacco marketing. *American Journal of Preventive Medicine*, *22*(4), 228–233. https://doi.org/10.1016/S0749-3797(02)00420-8

CodeBlue. (2023, March 3). Fast Food Environment And Obesity—Kimberly Wong & Prof Dr Moy Foong Ming. *CodeBlue*

Curtis, A. C., Waters, C. M., & Brindis, C. (2011). Rural adolescent health: The importance of prevention services in the rural community. *The Journal of Rural Health: Official Journal of the American Rural Health Association and the National Rural Health Care Association*, *27*(1), 60–71. https://doi.org/10.1111/j.1748-0361.2010.00319.x

Dartanto, T., Moeis, F. R., Nurhasana, R., Satrya, A., & Thabrany, H. (2018). Parent smoking behavior and children's future development: Evidence from Indonesia Family Life Survey (IFLS). *Tobacco Induced Diseases*, *16*(3). https://doi.org/10.18332/tid/94561

Dyer, O. (2022). Groundbreaking anti-smoking laws advance in Malaysia and New Zealand. *BMJ*, *378*, o1967. https://doi.org/10.1136/bmj.o1967

Haye, K. de la, D'Amico, E. J., Miles, J. N. V., Ewing, B., & Tucker, J. S. (2014). Covariance among Multiple Health Risk Behaviors in Adolescents. *PLOS ONE*, *9*(5), e98141. https://doi.org/10.1371/journal.pone.0098141

Hoe, C., Cohen, J. E., Yang, T., Peng, S., & Zhang, W. (2022). Association of cigarette production and tobacco retailer density on secondhand smoke exposure in urban China. *Tobacco Control*, *31*(e2), e118–e125. https://doi.org/10.1136/tobaccocontrol-2021-056655

Kim, S., & Selya, A. (2022). Rural disparities in adolescent smoking prevalence. *The Journal of Rural Health*, *38*(2), 360–363. https://doi.org/10.1111/jrh.12610

Leatherdale, S. T., & Strath, J. M. (2007). Tobacco retailer density surrounding schools and cigarette access behaviors among underage smoking students. *Annals of Behavioral Medicine*, *33*(1), 105–111. https://doi.org/10.1207/s15324796abm3301_12

Levin, K. A. (2014). Urban–rural differences in adolescent eating behaviour: A multilevel cross-sectional study of 15-year-olds in Scotland. *Public Health Nutrition*,

17(8), 1776–1785. https://doi.org/10.1017/S1368980013002127

Lim, K. H., Teh, C. H., Pan, S., Ling, M. Y., Yusoff, M. F. M., Ghazali, S. M., Kee, C. C., Lim, K. K., Chong, K. H., & Lim, H. L. (2018). Prevalence and factors associated with smoking among adults in Malaysia: Findings from the National Health and Morbidity Survey (NHMS) 2015. *Tobacco Induced Diseases*, *16*, 01. https://doi.org/10.18332/tid/82190

Littlecott, H. J., Moore, G. F., Evans, R. E., Melendez-Torres, G. J., McCann, M., Reed, H., Mann, M., Dobbie, F., Jennings, S., Donaldson, C., & Hawkins, J. (2023). Perceptions of friendship, peers and influence on adolescent smoking according to tobacco control context: A systematic review and meta-ethnography of qualitative research. *BMC Public Health*, *23*(1), 424. https://doi.org/10.1186/s12889-022-14727-z

Maxwell, K. A. (2002). Friends: The Role of Peer Influence Across Adolescent Risk Behaviors. *Journal of Youth and Adolescence*, *31*(4), 267–277. https://doi.org/10.1023/A:1015493316865

Mayhew, K. P., Flay, B. R., & Mott, J. A. (2000). Stages in the development of adolescent smoking. *Drug and Alcohol Dependence*, *59*, 61–81. https://doi.org/10.1016/S0376-8716(99)00165-9

McMillan, C., Felmlee, D., & Osgood, D. W. (2018). Peer influence, friend selection, and gender: How network processes shape adolescent smoking, drinking, and delinquency. *Social Networks*, *55*, 86–96. https://doi.org/10.1016/j.socnet.2018.05.008

Megatsari, H., Astutik, E., Gandeswari, K., Sebayang, S. K., Nadhiroh, S. R., & Martini, S. (2023). Tobacco advertising, promotion, sponsorship and youth smoking behavior: The Indonesian 2019 Global Youth Tobacco Survey (GYTS). *Tobacco Induced Diseases*, *21*, 163. https://doi.org/10.18332/tid/174644

Mohd Hanim, M. F., Md Sabri, B. A., & Yusof, N. (2021). Online News Coverage of the Sugar-Sweetened Beverages Tax in Malaysia: Content Analysis. *JMIR Public Health and Surveillance*, *7*(8), e24523. https://doi.org/10.2196/24523

Murayama, N. (2015). Effects of Socioeconomic Status on Nutrition in Asia and Future Nutrition Policy Studies. *Journal of Nutritional Science and Vitaminology*, *61*(Supplement), S66–S68. https://doi.org/10.3177/jnsv.61.S66

Nargiso, J. E., Becker, S. J., Wolff, J. C., Uhl, K. M., Simon, V., Spirito, A., & Prinstein, M. J. (2012). Psychological, Peer, and Family Influences on Smoking Among an Adolescent Psychiatric Sample. *Journal of Substance Abuse Treatment*, *42*(3), 310–318. https://doi.org/10.1016/j.jsat.2011.07.010

Nurhayati, N., Kusuma, D., Tarigan, A., Siregar, P., Hasibuan, R., & Ahsan, A. (2022). Exposure to Outdoor Tobacco Advertisements Near Home is Associated with Smoking among Youth in Indonesia. *Asian Pacific Journal of Cancer Prevention*, *23*(7), 2179–2183. https://doi.org/10.31557/APJCP.2022.23.7.2179

Nurwanti, E., Hadi, H., Chang, J.-S., Chao, J. C.-J., Paramashanti, B. A., Gittelsohn, J., & Bai, C.-H. (2019). Rural–Urban Differences in Dietary Behavior and Obesity: Results of the Riskesdas Study in 10–18-Year-Old Indonesian Children and

Adolescents. *Nutrients*, *11*(11), 2813. https://doi.org/10.3390/nu11112813

Perera, I., & Ekanayake, L. (2011). Influence of oral health-related behaviours on income inequalities in oral health among adolescents. *Community Dentistry and Oral Epidemiology*, *39*(4), 345–351. https://doi.org/10.1111/j.1600-0528.2010.00606.x

Ramadas, A., Tham, S. M., Lalani, S. A., & Shyam, S. (2021). Diet Quality of Malaysians across Lifespan: A Scoping Review of Evidence in a Multi-Ethnic Population. *Nutrients*, *13*(4), 1380. https://doi.org/10.3390/nu13041380

Robalino, J. D., & Macy, M. (2018). Peer effects on adolescent smoking: Are popular teens more influential? *PLoS ONE*, *13*(7), e0189360. https://doi.org/10.1371/journal.pone.0189360

Roberts, M. E., Teferra, A. A., Keller-Hamilton, B., Patterson, J. G., & Ferketich, A. K. (2020). Shared and unique risk factors for tobacco use among rural versus urban adolescents. *Preventive Medicine*, *140*, 106239. https://doi.org/10.1016/j.ypmed.2020.106239

Salvy, S.-J., De La Haye, K., Bowker, J. C., & Hermans, R. C. J. (2012). Influence of peers and friends on children's and adolescents' eating and activity behaviors. *Physiology & Behavior*, *106*(3), 369–378. https://doi.org/10.1016/j.physbeh.2012.03.022

Sawyer, S. M., Afifi, R. A., Bearinger, L. H., Blakemore, S.-J., Dick, B., Ezeh, A. C., & Patton, G. C. (2012). Adolescence: A foundation for future health. *The Lancet*, *379*(9826), 1630–1640. https://doi.org/10.1016/S0140-6736(12)60072-5

Shi, Z., Lien, N., Kumar, B. N., & Holmboe-Ottesen, G. (2005). Socio-demographic differences in food habits and preferences of school adolescents in Jiangsu Province, China. *European Journal of Clinical Nutrition*, *59*(12), 1439–1448. https://doi.org/10.1038/sj.ejcn.1602259

Story, M., & Resnick, M. D. (1986). Adolescents' views on food and nutrition. *Journal of Nutrition Education*, *18*(4), 188–192. https://doi.org/10.1016/S0022-3182(86)80015-2

UNICEF. (2020). *Education and Adolescents | UNICEF Indonesia*.

Unicef. (2020). *Education and Adolescents* | UNICEF Indonesia.

Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet, 379*(9826), 1641–1652. https://doi.org/10.1016/S0140-6736(12)60149-4

Vlismas, K., Stavrinos, V., & Panagiotakos, D. B. (2009). Socio-economic Status, Dietary Habits and Health-Related Outcomes in Various Parts of the World: A Review. *Central European Journal of Public Health, 17*(2), 55–63. https://doi.org/10.21101/cejph.a3475

Widiastuti, A. (2022). Analisis Sektor Ekonomi Unggulan di Kabupaten Lebak Periode Tahun 2016-2020. *Jurnal Ekonomi-Qu*, *12*(1), Article 1. https://doi.org/10.35448/jequ.v12i1.16303

York, N. L., Rayens, M. K., Zhang, M., Jones, L. G., Casey, B. R., & Hahn, E. J. (2010). Strength of tobacco control in rural communities. *The Journal of Rural Health: Official Journal of the American Rural Health Association and the National Rural Health Care Association*, *26*(2), 120–128. https://doi.org/10.1111/j.1748-0361.2010.00273.x

Yoshikawa, H., Aber, J. L., & Beardslee, W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. *American Psychologist*, *67*(4), 272–284. https://doi.org/10.1037/a0028015