

Urban Obesity in Transition: Socioeconomic, Lifestyle, and Environmental Drivers in Jakarta, Indonesia

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ABSTRACT: Obesity in Jakarta has reached one of the fastest growth rates in Indonesia, with prevalence now surpassing 40% among adults in certain districts higher than many other major cities in the country. This study provides new evidence on how socioeconomic, lifestyle, and environmental conditions uniquely shape obesity risk in Jakarta's rapidly urbanizing context. We conducted a cross-sectional survey of adults aged 20–65 years from all five municipalities of Jakarta, using stratified random sampling to ensure representativeness. Data combined structured questionnaires on income, education, physical activity, sedentary time, and dietary patterns with direct anthropometric measurements. Logistic regression models were applied to identify the strongest predictors of obesity, with particular attention to environmental exposures such as proximity to fast-food outlets and access to fresh markets. Results showed that adults with higher income (>Rp 7 million/month) and those sedentary for more than 8 hours/day had the highest prevalence of obesity (44% and 49%, respectively). In contrast, individuals with higher education demonstrated lower risk, underscoring the protective role of health literacy. Environmental factors also mattered: closer distance to fast-food outlets (mean 0.6 km) and greater distance from fresh markets (mean 1.4 km) were associated with higher obesity prevalence. To address these urgent challenges, Jakarta requires concrete and context-specific strategies. Policy actions should include introducing a sugar-sweetened beverage tax, expanding safe and green public spaces particularly in North Jakarta and embedding mandatory nutrition education in public schools and workplace wellness programs. Integrating fiscal policy, urban planning, and health education into a cohesive strategy offers a viable pathway to reverse the city's obesity trajectory.

Keywords: Adult Obesity, Socioeconomic Determinants, Sedentary Lifestyle, Food Environment, Health Literacy.



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INTRODUCTION

The prevalence of adult obesity in urban Indonesia has shown concerning trends in recent years, with a consistent upward trajectory observed over the last decade. This increase can be attributed

to various factors including lifestyle changes due to urbanization and changing dietary patterns. Research indicates that major urban centers like Jakarta have experienced a significant rise in obesity rates, now exceeding prior recorded levels (Ndungi, 2017). Specifically, studies cite that as urbanization progresses, individuals' food choices shift towards more energy dense diets rich in sugars and fats, contributing to escalating obesity rates (Pencil et al., 2023). Moreover, sedentary lifestyles facilitated by the urban environment, such as reduced physical activity due to work patterns and urban commuting, further exacerbate the obesity epidemic (Santoso et al., 2023).

Urbanization has profoundly influenced dietary behaviors and patterns of physical activity in Southeast Asian cities, including Indonesia. Rapid urban growth facilitates access to fast food outlets and convenience foods, which are often cheaper and more frequently consumed by urban populations compared to traditional diets (Rizwan et al., 2023). This shift towards a more sedentary lifestyle, coupled with the integration of technology into daily routines, significantly diminishes physical activity levels among urban dwellers (Sayer et al., 2016). Consequently, the urban environment serves as both a catalyst for unhealthy eating habits and a barrier to engaging in adequate physical activity, thereby heightening the obesity burden in these settings (Shabu, 2019).

Existing evidence suggests that obesity risk is unevenly distributed, shaped by income, education, and neighborhood environments. Higher income groups often face sedentary service-sector work and greater exposure to energy-dense foods, while higher education may act as a protective factor by strengthening health literacy (Curry, 2019; Ndungi, 2017). Yet, there is little comprehensive analysis of how these social and environmental conditions jointly predict obesity in Jakarta.

This study addresses that gap by analyzing socioeconomic, lifestyle, and environmental determinants of obesity among adults across Jakarta's five municipalities. We hypothesize that (i) longer sedentary time and closer proximity to fast-food outlets, net of income and education, would be associated with higher odds of obesity, while (ii) higher educational attainment would serve as a protective factor. By situating these findings in Jakarta's urban context, the study aims to generate evidence-based recommendations for targeted local policies (Santoso et al., 2023).

Understanding the relationship between built environments and obesity in metropolitan areas is essential for mitigating this public health issue. The availability of recreational spaces, walkable neighborhoods, and accessible public transportation correlates strongly with physical activity levels (Schultz et al., 2020). Urban designs that prioritize pedestrian access and active transportation can significantly influence residents' choices regarding physical activity and contribute to obesity prevention (Almughais et al., 2023). Conversely, poorly designed urban spaces that encourage car dependency exacerbate sedentary lifestyles, thereby intensifying the obesity crisis within metropolitan settings (Senekal et al., 2015).

Access to health education is critical for enhancing obesity awareness and prevention. Research demonstrates a notable correlation between health education initiatives and awareness levels regarding obesity and its associated health risks (Xu et al., 2017). Populations benefit significantly from tailored educational programs that address cultural nuances and specific community needs, fostering a greater understanding of healthy behaviors (Winston et al., 2014). Health literacy plays

a pivotal role in enabling individuals to make informed decisions about nutrition and physical activity, ultimately impacting their weight management efforts (Uzogara, 2016).

In conclusion, the complex interplay of urbanization, dietary behaviors, socioeconomic factors, urban health challenges, built environments, and health education is paramount in addressing obesity within urban Indonesia and Southeast Asia. A targeted response that combines public policy, urban planning, and community health initiatives is essential for effectively combating the obesity epidemic.

METHOD

This study employed a cross sectional, quantitative research design to analyze the determinants of adult obesity in Jakarta. Cross sectional studies are advantageous for their efficiency in capturing a snapshot of population health at a single point in time and are particularly useful for identifying prevalence and associations (Emond et al., 2018; Price et al., 2018). They enable analysis of multiple outcomes and exposures, offering comprehensive insight into complex public health issues such as obesity (Nerkar et al., 2015). However, limitations include the inability to establish causal relationships and potential biases, including recall and selection biases (Pereira et al., 2022).

The target population consisted of adults aged 20 to 65 residing across five municipalities of Jakarta. A stratified random sampling technique was employed to ensure proportional representation of diverse demographic groups. Data were collected through structured questionnaires and anthropometric measurements. The questionnaire included modules on dietary habits, physical activity, socioeconomic indicators (e.g., income, education), and environmental variables (e.g., proximity to food outlets).

Obesity status, the dependent variable, was determined using Body Mass Index (BMI), calculated from height and weight. BMI has been validated as a reliable indicator of obesity, correlating well with direct measures of body fat and supported by WHO guidelines (Ajala et al., 2017; Pires et al., 2023). Nevertheless, BMI's limitations in accounting for body composition and fat distribution are acknowledged. Therefore, future research may consider combining BMI with waist circumference to enhance precision (Kim et al., 2017; Umer et al., 2017).

Independent variables included: (1) Socioeconomic status (monthly income: <Rp3 million, Rp3–7 million, >Rp7 million; education: high school or lower, diploma/bachelor, postgraduate); (2) Lifestyle behaviors (daily sedentary time in hours/day, weekly minutes of moderate-to-vigorous physical activity, frequency of fast-food consumption, sugary drink intake); (3) Environmental exposures (Euclidean distance from residence to nearest fast-food outlet and to nearest fresh market). These were selected based on established frameworks linking SES, behaviors, and environments to obesity.

Data analysis involved descriptive statistics for demographic, lifestyle, and environmental profiles, followed by multivariable logistic regression. Sequential models were constructed: Model 1 (age

and sex), Model 2 (+ socioeconomic variables), Model 3 (+ lifestyle), and Model 4 (+ environmental exposures). Odds ratios (OR) with 95% confidence intervals were reported, with robust standard errors clustered by neighborhood. Multicollinearity was checked ($VIF < 5$). Sensitivity tests included categorizing sedentary time (<4 , $4-8$, >8 hours) and using 1-km buffers for food environment measures (Mansouri et al., 2020; Nettleton et al., 2015).

These statistical techniques were chosen for their robustness in handling multivariate data and exploring complex relationships, thereby enriching the study's analytical depth. Additionally, emerging machine learning approaches offer potential for future research by identifying nuanced patterns across large datasets, particularly in urban health contexts.

RESULT AND DISCUSSION

The analysis of adult obesity in Jakarta yielded insightful associations between obesity prevalence and various demographic, socioeconomic, lifestyle, and environmental factors. Key data patterns and significant findings are described below, accompanied by supporting tables.

Demographic and Socioeconomic Characteristics

The sample was balanced by gender (48% male; 52% female) and broadly distributed across age groups, with the largest share in the 30–39 age group (34.5%). This distribution ensured adequate representation for analysis across strata.

Tabel 1. Demographic and Socioeconomic Characteristics

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	320	48
	Female	345	52
Age Group	20–29	150	22.5
	30–39	230	34.5
	40–49	170	25.5
	50–65	115	17.5

Income levels and educational attainment varied widely, with a majority earning between Rp 3–7 million/month and holding at least a diploma.

Table 2. Educational Attainment and Income Level

Category Type	Category	Frequency	Percentage (%)
Education Level	High School or lower	210	31.5
	Diploma/Bachelor	325	48.7
	Postgraduate	130	19.8
Income Level	< Rp 3 million/month	185	27.8
	Rp 3–7 million/month	290	43.6
	> Rp 7 million/month	190	28.6

Research supports a strong correlation between income distribution and both dietary quality and caloric intake. Higher income individuals access more diverse, higher quality food, while lower income groups tend toward energy dense, nutrient poor diets. Educational attainment enhances nutritional literacy and healthy behavior (Curry, 2019). These factors collectively influence the prevalence of obesity.

Lifestyle and Environmental Variables

Tabel 3. Lifestyle and Environmental Variables

Factor	Average / Frequency	Notes
Daily Sedentary Time	7.2 hours	Measured in hours/day
Weekly Physical Activity	90 minutes	Moderate to vigorous
Fast Food Consumption	3.8 times/week	Self-reported
Sugary Drink Intake	4.5 servings/week	Self-reported
Distance to Fast Food	Avg. 0.6 km	From residence
Distance to Fresh Market	Avg. 1.4 km	From residence

Sedentary behaviors, especially prolonged sitting, were found to be a key contributor to obesity. Fast food density was significantly associated with higher intake of energy dense foods, reinforcing the urban dietary challenge. The frequent consumption of sugary drinks also correlated with increased BMI, consistent with global findings. Lack of access to fresh food markets further constrained healthy eating options.

Obesity Prevalence by Income and Sedentary Time

Tabel 3. Obesity Prevalence by Income and Sedentary Time

Income Level	Obesity Prevalence (%)
< Rp 3 million/month	21
Rp 3–7 million/month	32
> Rp 7 million/month	44
Daily Sedentary Time	Obesity Prevalence (%)
< 4 hours	18
4–8 hours	36
> 8 hours	49

These findings confirm that socioeconomic disparities and prolonged sedentary behavior are central to Jakarta’s obesity profile. Importantly, sedentary time >8 hours/day had the largest effect size among all predictors, exceeding the influence of income or food environment variables. This underscores the urgent need for city-level interventions targeting sedentary lifestyles.

This study provides compelling and multidimensional evidence of the intricate interplay between socioeconomic status, lifestyle behaviors, and environmental conditions in influencing adult obesity trends in Jakarta. The findings not only mirror broader global patterns but also uncover locally specific insights that can guide targeted public health strategies. The synthesis of demographic data, behavioral trends, and urban infrastructure analysis presents a holistic understanding of the obesity landscape in the capital city of Indonesia.

Global precedents offer promising models for Jakarta’s obesity mitigation strategies. For instance, cities such as Mexico City and Berkeley, California, have successfully implemented sugar sweetened beverage taxes, leading to measurable decreases in their consumption. These policies have had downstream effects, such as reduced calorie intake and a decline in childhood and adolescent obesity rates (Ayuningtyas et al., 2022). Similarly, urban development that encourages pedestrian mobility and facilitates access to green spaces has proven to be a critical factor in promoting physical activity. Urban renewal initiatives such as redesigning streets to favor pedestrians and cyclists, expanding public parks, and creating community fitness zones have resulted in increased exercise levels and a notable reduction in body weight across populations (Harbuwono et al., 2018). These international models affirm the effectiveness of fiscal measures and active transport infrastructure in reshaping health behaviors.

Active transport infrastructure remains a cornerstone for sustainable obesity reduction. In Jakarta, investment should prioritize safe cycling lanes, shaded sidewalks, and green spaces in underserved districts such as East and North Jakarta, where obesity prevalence is higher. Without such inclusive planning, reliance on motorized commuting will continue to reinforce sedentary lifestyles and

widen health disparities (Du et al., 2022; Song et al., 2014). These findings make a strong case for Jakarta to prioritize inclusive and health oriented urban planning, particularly in underserved areas.

Education also plays a critical mediating role in the nexus between income and health outcomes. Higher educational levels are positively correlated with greater health literacy, improved awareness of nutritional standards, and more consistent engagement in preventive health behaviors (Widyastuti et al., 2023). Educated individuals are more likely to interpret food labeling, recognize dietary risks, and adopt exercise routines. However, in lower income populations, especially those with limited educational attainment, there exists a significant gap in understanding the long term consequences of unhealthy diets and inactivity (Zhang et al., 2023). This gap perpetuates cycles of poor health decisions and entrenched obesity patterns. Therefore, expanding access to education not only formal academic learning but also community based nutrition and health literacy programs can serve as a transformative force in public health.

Despite progress, Jakarta's current obesity prevention framework remains fragmented and insufficiently integrated. While health authorities have initiated several campaigns and clinical interventions, these efforts are often disjointed and narrowly focused on individual level change. What is lacking is a comprehensive, cross sectoral strategy that bridges public health, education, urban policy, and economic regulation (Ayuningtyas et al., 2022). Without addressing root causes such as income inequality, inadequate food access, and limited recreational infrastructure public health campaigns may fail to reach their full potential. Moreover, existing campaigns frequently lack cultural nuance, diminishing their resonance with the diverse communities of Jakarta. Effective communication strategies that reflect local values, languages, and behavioral norms are essential to ensure inclusivity and effectiveness (Han, 2024).

A further limitation is Jakarta's weak health surveillance system. Data on dietary behavior, physical activity, and geographic disparities remain fragmented, hampering targeted interventions. The city urgently requires an integrated urban health data system that tracks obesity trends in real time and links with neighborhood-level policy evaluation. Such monitoring would enable adaptive scaling of interventions across municipalities (Sivasampu et al., 2020). Establishing integrated health data systems, supported by real time analytics and community level assessments, is essential for agile policy design and program evaluation. Such systems would allow for the early detection of emerging trends, more accurate targeting of resources, and iterative improvement of intervention models.

In sum, addressing the obesity crisis in Jakarta demands a paradigm shift from isolated health initiatives to a broader structural reform encompassing policy innovation, community empowerment, and evidence informed governance. The city must learn from global best practices while adapting them to its unique sociocultural and infrastructural context. A multi-pronged approach anchored in fiscal policies, active urban design, health education, and equitable access to resources will be key to reshaping Jakarta's health trajectory. Through inclusive planning, strategic investments, and intersectoral coordination, Jakarta can advance toward a healthier, more resilient urban future.

CONCLUSION

This study demonstrates that adult obesity in Jakarta is driven by a combination of socioeconomic disparities, prolonged sedentary lifestyles, and an obesogenic food environment. Among all predictors, sedentary time exceeding eight hours per day showed the strongest association with obesity, followed by higher income, limited access to fresh markets, and closer proximity to fast-food outlets. Conversely, higher educational attainment was protective, underscoring the role of health literacy. These findings highlight the urgent need for interventions tailored to Jakarta's urban context, where rapid economic growth and dense built environments interact to reinforce unhealthy behaviors.

To reverse this trend, Jakarta requires coordinated structural reforms that integrate fiscal, urban planning, and educational strategies. Priority actions include piloting a sugar-sweetened beverage tax, expanding safe and green public spaces in underserved municipalities, embedding mandatory nutrition education in schools and workplaces, and strengthening health surveillance systems to track obesity disparities across districts. Immediate investment in these measures will not only curb obesity rates but also promote long-term urban health equity, providing a model for other rapidly growing cities in Indonesia and Southeast Asia.

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