REVIEW ARTICLE

Relation Between Energy Intake and Obesity or Overweight in Childbearing Age Woman: A Scoping Review

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ABSTRACT

Background: Obesity is a problem that affects public health all over the world, and the prevalence of obesity among women is twice as high as it is among males. The objective is to discuss the prevalence of obesity or overweight among women of reproductive age.

Methods: We use a scoping review method using academic journals published from 2018 to 2023. The literature was searched using electronic databases Google Scholar and PubMed. We make use of the following search terms: overweight or obesity, prevalence or incidence, childbearing age or early adulthood, and either Indonesia or Asian. A total of 173 research was identified and 9 research was included in this review.

Results: The study highlights the link between dietary patterns, particularly fast food, and obesity among childbearing age women. It emphasizes the importance of maternal dietary choices in young adulthood to reduce maternal obesity, hypertension, and CVD. Combining these parameters can provide a more comprehensive assessment.

Conclusions: Food selection is crucial for women and young adults to prevent obesity and NCDs, requiring education, awareness campaigns, maternal health support, and early intervention, especially in low-income countries.

Key-words: Obesity, Overweight, Women, Childbearing Age

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INTRODUCTION

Obesity is a global phenomenon that is becoming a bigger public health issue. As a direct result of being overweight or obese, at least 2.8 million people will die each year in 2021, demonstrating that the global obesity epidemic has reached epidemic proportions.[1] Data indicates a higher prevalence of obesity in females compared to males across all age groups. Furthermore, the combined prevalence of overweight and obesity exhibits a positive association with age, reaching a peak between 50 and 65 years. This peak is followed by a slight downward trend.[2] The prevalence of obesity, which was once only found in nations with high incomes, has now spread to countries with low and intermediate incomes as well.[1] In Indonesia, based on 2018 Basic Health Research data, the prevalence of obesity and overweight in adults aged >18 years, from 2007 to 2018 with a BMI indicator of >25.0 has increased, in 2007 it was 10.5%, increasing in 2013 to 14.8%, and increased again in 2018 amounting to 21.8%. Overweight and obese among women have a higher prevalence of 14.8% and 24% compared to overweight and obese among men of 11.9% and 11.5% respectively. So that the risk of obesity among women is two times greater than that among males.[3]

Obesity is defined as excessive fat deposits that increase BMI which can lead to a concomitant increase in the prevalence of type 2 diabetes[4] and heart disease[5]. Obesity is also associated with accelerated aging, impaired intelligence, insulin resistance, cancer, osteoarthritis, cholelithiasis, and death at a young age.[6] Particularly susceptible to weight increase are women who are of childbearing age, which is defined as the age range between 15 and 44 years. Numerous large cohort studies have demonstrated that this particular life stage is the time of maximum weight gain.[7] In addition, they will enter into marriages while carrying the risk of developing obesity during their pregnancy. Regrettably, the occurrence of obesity during pregnancy substantially elevates the likelihood of complications for both the expectant mother and the developing foetus, potentially resulting in impaired mobility, elevated mortality rates, and an expanded spectrum of health complications.[8,9] For mothers, its consequences hypertension[10], gestational diabetes[11,12], miscarriage[13], and postpartum hemorrhage[14]. For babies, the risk of stillbirth is elevated during pregnancy.[15] Additionally, they have a greater likelihood of experiencing difficulties during labour, such as shoulder dystocia[16], macrosomia[15], and an increased chance of impairment[9].

In general obesity can be caused by a genetic history in parents[17] and a lack of physical activity[18]. Another cause of obesity is a socioeconomic factor above poverty and excessive calorie intake.[18] But, among women childbearing age, obesity may induce by the use of hormonal contraceptives, such as injections, pills, and implants may influence obesity rates.[19] Contraceptives contain hormones like estrogen and progesterone, which can affect weight in different ways. Estrogen may contribute to fluid retention by reducing the body's ability to eliminate sodium and water. Progesterone, on the other hand, potentially increase appetite and promote the conversion of carbohydrates and sugars into fat.[20,21] As the highest causal factor in the incidence of obesity, using Scoping review we intend to discuss about relation between energy intake and obesity or overweight in childbearing age women.

METHODOLOGY

Figure 1 shows a flow diagram that followed the recommended reporting items for systematic reviews and meta-analyses extension for scoping reviews (PRISMA-ScR) to illustrate the flow of publications from the search to its final selection.[22] The study design was used to identify energy intake and overweight prevalence and their relationship. The flow of publications from the search to its final selection was displayed in a flow diagram that adhered to the preferred reporting items for systematic reviews and meta-analyses extension for scoping reviews (PRISMA-ScR) as shown in Figure 1.

Determining the focus of the research: The focus of the research were: 1) What is the prevalence of obesity or overweight in childbearing age?; 2) Which evaluation instruments are used to assess energy consumption and obesity in women of childbearing age?; 3) What is the relation between energy intake in childbearing age with obesity or overweight?.

Identifying relevant studies: The electronic databases like Google Scholar and PubMed were used to conduct an electronic search. All full-text accessible academic journals published between 2018 and 2023 in both English and Indonesian that related to the subject were thoroughly searched. The search covered all research design types, including retrospective and prospective cohort studies among women of reproductive age, as well as observational studies such as cohort, randomized, longitudinal, cross-sectional, and case control studies.

Study selection: Following a careful review process, the papers were chosen if the data regarding: 1) the study population comprises individuals of childbearing age; 2) the prevalence of overweight in childbearing age; 3) the relation between energy intake and overweight; 4) located in Indonesia or Asian. We apply key search terms Overweight **OR** Obesity **AND** prevalence **OR** incidence **AND** childbearing age **OR** Early adulthood **AND** In Indonesia **OR** Asian as depicted as below

Key Search Terms
Overweight **OR** Obesity **AND** energy intake **OR** calorie intake **AND** childbearing age **OR** Early adulthood
Overweight **OR** Obesity **AND** prevalence **OR** incidence **AND** childbearing age **OR** Early adulthood **AND** In Indonesia **OR** Asian

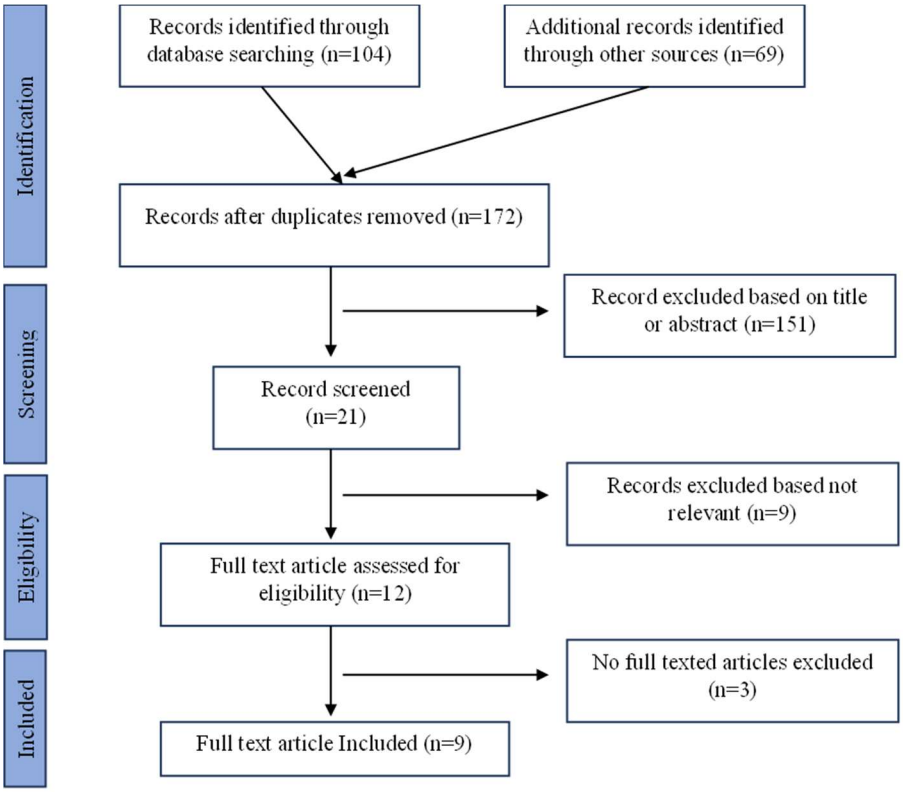

Figure 1: Flowchart of Scoping Review

Charting the data: After initially screening the database to identify entries relevant to the main topic, a more detailed screening process was then conducted. This involved applying specific inclusion criteria to select studies or data that were pertinent to the research objectives. Concurrently, exclusion criteria were used to filter out any studies or data that did not meet the necessary standards or were deemed irrelevant. This two-step screening ensured that only the most relevant and high-quality information was retained for further analysis.

Participant criteria: The included studies were: 1) the subject was childbearing age; 2) human participants; 3) published in English or Indonesian languages; and 4) accessible in free full-text only. Criteria which are excluded research on a different obesity factor, unrelated to energy consumption. All remaining data were included in this coping review, after the exclusion of full-text articles that did not meet the criteria.

Collating, summarizing and reporting the result: The studied were summarised by presenting country, study design, participants characteristics, and findings. Then extracted into the assessment, prevalence of obesity, and the relationship between energy intake and obesity.

RESULTS

During the searching process, 173 titles and 172 abstracts were found that may be included. As can be seen, nine items have been selected for final screening as shown in Figure 1. This study summarized the findings on the assessment of overweight, assessment of energy intake, and the result of the study, as figure out in Table 1.

Based on these nine articles, we get brief information energy intake modifications can help overweight or obese women, and that MI is a useful strategy for weight loss.[23] The second study showed that high protein intake with physical activity have high impact for decreasing obesity.[24] Among women reproductive in Bandung, Indonesia, obesity was related to the frequency of fast-food intake more than twice a week.[25] This result is consistent with a Chinese study that found that high-fat diets and higher fat intake were positively correlated with body weight, BMI, and the chance of being overweight or obese in both men and women.[26] Study using multivariable regression analysis revealed significant associations between obesity and age, parity, residency, education, religion, wealth, and TV watching, with age and wealth status being the strongest predictors for both pregnant and non-pregnant women.[27] Other study found that high economic status, marriage and 3 or more children have association with obesity.[28] Beside that, obesity is also related to age, education, wealth index, TV watching, and contraceptive use.[29] Hence Muslims and living in urban also associated with increasing risk of overweight/obesity.[19] Lastly, compared to individual measurements like BMI, waist circumference, waist to hip ratio, the anthropometric Risk Index (ARI) provides a more thorough assessment to predicts mortality risk.[30]

Table 1: An overview of research on energy intake and obesity

Author and Country	Study Design	Participants Characteristics	Assessment Overweight	Assessment Energy Intake	Results
Iran: Azami et al, 2020[23]	Randomized control trial	70 women (18-35 years old) with preconception care	Ht, Wt, and BMI	24 hours food record	Motivation interviewing and modifying energy intake can help women with preconception, who are obese or overweight to lose weight efficient. It is protected themselves from the negative effects of pregnancy.
China: Zichong et.al,2022[24]	Extracted data	2481 women (15-44 years old)	Wt, Ht, WC, WHtR	Three consecutive 24 hours recalls (two working days and one weekend)	Chinese women of childbearing age's central obesity prevalence increased from 21.6% to 30.7%, with protein intake above AMDR and non-participation LTPA as risk factors.
Bandung, Indonesia: Karisa, Salma., & Agil Dhiemitra (2022)[25]	Cross sectional design.	155 women reproductive age (15-49 years old)	BMI	Food Frequency Survey	There is a significant relation between fast food consumption and incidence of obesity in woman of childbearing age.
China, Wang et al, 2020[26]	Cohort	23,859 respondents	BMI, Wt	A total of three 24-hour dietary recalls, as well as the quantity of condiments and foods in home inventories	Elevated intake of fat and energy is associated with BMI, body weight, and the likelihood of becoming overweight or obese. Limiting the amount of fat in food is important for public health because it can affect programs to manage obesity and overweight.
India: Yaya, S. & Ghose, B. 2020[27]	Cross-sectional study	Women non-pregnant (655,850) and pregnant (32,026) aged (15-49 years)	BMI, Wt, Ht	-	Anthropometric factors BMI, WC, WHtR, and HC predict obesity and non-communicable diseases (NCDs), and combined risk measures (ARI) are useful in predicting cardiovascular disease.
India, Maldives, Hashan, et. al,2020[28]	Cross sectional design	6,634 women reproductive age	BMI	-	The study reveals that malnutrition is a significant issue in Maldivian women, with every three out of five being overweight or obese. It recommends surveillance and cost-effective interventions to address this problem, while further research is needed to explore dietary habits and risk factors.
Bangladesh, Chowdhury, M. A. B., Adnan, M. M., & Hassan, M. Z. (2018)[29]	Cross sectional design	58,192 women	BMI	-	Overweight and obesity rates among Bangladeshi women of reproductive age increased significantly between 1999 and 2014. Prioritising low-cost interventions is important in the fight against obesity.
India, Al Kibria, G., Swasey, K., Hasan, M.Z. *et al., 2019*[19]	Cross sectional study	647,168 women	BMI	-	The study indicates that a significant number of Indian women, particularly those in non-normal BMI categories, are at higher risk of complications from underweight or overweight/obesity.
Sri Lanka, Hewage N, Wijesekara U, Perera R, 2023[30]	Cross sectional design	282 women	BMI, WC, WHR, WHtR, HC, HI, ABSI, ARI, and biochemical characteristics.	-	Anthropometric measures such as BMI, WC, WHtR, and HC can be used to predict obesity and non-communicable diseases (NCDs), and when risks are combined, ARI can be used to predict cardiovascular disease.

Ht – Height, Wt – Weight, BMI – Body Mass Index, WC – Weist circumference, WHtR – Weist to height ratio, WHR – Weist hip ratio, ABSI - A Body Shape Index, ARI - Anthropometric risk index

DISCUSSION

The study highlights the link between consumption especially fast-food consumption and obesity in women of childbearing age. According to a study, the unhealthiest eating habits, including snacks, sandwiches, sweets, and soft drinks, are linked to obesity during pregnancy. These foods include industrialised and takeaway foods, as well as alcoholic and sugar-sweetened beverages. It is also typified by pregnant women who are younger, better educated, and have official job.[31] Unfortunately, there was a 26% higher chance of childhood obesity when mothers consumed ultra-processed meals in addition to the items mentioned above. The researchers discovered that this link between a mother's diet and her child's obesity risk remained consistent, even when considering other lifestyle factors, including ultra-processed food

intake.[32] Fast food consumption has also been linked to obesity in adults particularly abdominal obesity (waist-to-hip ratio). According to a study, the proportion of calories consumed by teenagers from fast food has surged fivefold over the previous three decades, and the prevalence of obesity has sharply increased globally.[33] Obesity in childbearing women is influenced by hormonal factors like estrogen and insulin, however eating habits is its major determinant. It is advisable that mothers restrict their consumption of ultra-processed foods, while refined dietary guidelines and enhanced access to superior nutrition. This study also resulted that breastfeeding lowers the risk of maternal obesity, hypertension, and CVD. This finding similar with previous research that breastfeeding both full or partial as protective to obesity. Hence, a combination of exclusive and intermittent breastfeeding was associated with enhanced cardiovascular health among mothers.

Study also finding that anthropometric parameters like BMI, WC, WHtR, and HC are important to predict obesity and non-communicable diseases (NCDs). These parameters provide valuable information about an individual's body composition and fat distribution, which are critical factors in determining the risk of developing NCDs such as type 2 diabetes, hypertension, stroke, and cardiovascular diseases (CVD).[34]

BMI widely used measure of body fat and is considered a good indicator of overall obesity. However, it has limitations, especially in predicting abdominal obesity, which is a more significant risk factor for NCDs.[34] Waist Circumference (WC) is a measure of abdominal obesity and is considered a better predictor of NCDs than BMI. A large waist circumference indicates a higher amount of intra-abdominal fat, which is associated with increased risks of type 2 diabetes, and cardiovascular disease. While Waist-to-Height Ratio (WHtR) a simple and reliable measure of abdominal obesity that has been shown to be a better predictor of NCDs than BMI.[35] Hip circumference is another anthropometric parameter that can provide information about an individual's body composition and fat distribution. It is particularly useful in assessing the distribution of fat in the lower body, which can influence the risk of developing NCDs.[35] By measuring and monitoring these anthropometric parameters, healthcare professionals can identify individuals at increased risk of obesity and NCDs, enabling early intervention and prevention strategies to be implemented. Additionally, combining these parameters, such as BMI and WC, can offer a more thorough evaluation of a person's health and risk factors.[35,36]

Likewise, the results demonstrated the urgency of obesity prevention interventions. It is critical to prioritise women who living in low socioeconomic area, as they face an elevated risk of obesity and associated health complications. Emphasising healthy eating patterns[37], increasing physical activity[37,38], addressing stress, and socioeconomic factors are all essential components of low-cost interventions[39]. In addition, initiatives may be considered to intervene by providing community members with opportunities to participate in obesity prevention programmes, implementing behaviour change strategies, and linking women with local resources through weight management plans. These interventions ought to be sustainable, cost-effective, engaging, and effective, with highlight on fostering long-term shifts in habit and attitudes.[37,40]

Conclusion

The study reveals a significant link between dietary patterns, particularly fast food and ultra-processed foods, and obesity in women of childbearing age. It emphasizes the importance of maternal dietary choices during young adulthood to reduce maternal obesity, hypertension, and CVD. The study also emphasizes the significance of anthropometric parameters in predicting obesity and NCDs. BMI is a widely used measure of body fat, but it has limitations in predicting abdominal obesity, a significant risk factor for NCDs. Waist circumference is a better predictor of NCDs than BMI, and WhtR is a reliable measure of abdominal obesity. Combining these parameters can provide a more comprehensive assessment of an individual's health and risk factors. Based on these findings, it is urgent to implement healthy eating promotion to reduce obesity, hypertension, and cardiovascular disease risks; awareness campaigns to increase awareness among young women about the long-term health effects of dietary choices; maternal health support to provide resources and guidance for young women to make healthier dietary decisions, and early screening and intervention.

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