

Fast Food and Chronic Disease: Exploring the Link Between Dietary Habits and Public Health Challenges

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Received : February 13, 2023

Accepted : March 23, 2023

Published : March 31, 2023

Citation: Lestari, A. (2023). Fast Food and Chronic Disease: Exploring the Link Between Dietary Habits and Public Health Challenges. *Journal of Health Literacy and Qualitative Research*, 3(1), 34-45.

ABSTRACT: Fast food consumption has surged globally, raising critical concerns for public health. This systematic review analyzes the relationship between fast food intake and its metabolic and cardiovascular impacts particularly on obesity, insulin resistance, type 2 diabetes, and hypertension. Evidence from the past two decades shows a consistent link between regular fast food consumption and increased risk of chronic diseases, driven by its high calorie, low nutrient composition and its contribution to inflammation and weight gain. These effects are exacerbated among low income populations and in urban environments. Importantly, this study highlights the influence of food marketing, policy environments, and socioeconomic factors in shaping dietary behaviors. Countries with comprehensive nutrition regulations such as taxation on unhealthy food and advertising restrictions report lower dependence on fast food and improved public health outcomes. Thus, this review emphasizes the urgent need for multi sectoral policy interventions to reduce fast food consumption and its health consequences. The findings contribute to public health discourse by offering evidence based insights for formulating targeted nutritional policies, promoting dietary education, and addressing socioeconomic disparities in access to healthy foods.

Keywords: Fast Food Consumption, Metabolic Disorders, Obesity, Cardiovascular Health, Nutrition Policy, Public Health Interventions, Dietary Behavior.



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INTRODUCTION

The consumption of fast food has become a rapidly growing global phenomenon, driven by globalization, urbanization, and lifestyle changes. While fast food offers convenience and affordability, its widespread consumption has raised significant public health concerns. The increasing prevalence of obesity, diabetes, and cardiovascular diseases has been linked to the excessive intake of ultra-processed foods, which are often energy-dense but nutritionally poor. Studies indicate that dietary patterns characterized by high consumption of fast food are associated with metabolic disorders and increased risk of non-communicable diseases (NCDs) (Nardocci et al., 2020; Casas, 2021; Barbosa et al., 2022). This growing public health crisis necessitates a comprehensive review of the impacts of fast food consumption on global health outcomes.

Fast food is typically high in refined carbohydrates, unhealthy fats, added sugars, and sodium, making it a major contributor to diet-related health issues. Research conducted in Canada has demonstrated a strong correlation between ultra-processed food intake and increased prevalence of obesity, hypertension, and type 2 diabetes (Nardocci et al., 2020). Additionally, studies suggest that prolonged consumption of fast food disrupts normal metabolic functions, contributing to systemic inflammation, insulin resistance, and elevated cholesterol levels (Casas, 2021; Barbosa et al., 2022). Given the increasing dependency on fast food, particularly in urban settings, understanding its long-term health implications is essential for formulating effective public health policies.

The effects of fast food consumption extend beyond adults, significantly impacting children and adolescents. Dietary habits established during childhood often persist into adulthood, making early dietary interventions crucial (Athavale et al., 2020). Studies indicate that frequent consumption of junk food during childhood is linked to increased risk of dental caries, nutritional deficiencies, and unhealthy weight gain (Latreyi et al., 2020). Furthermore, exposure to aggressive marketing tactics by fast food industries influences children's food preferences, leading to excessive intake of unhealthy food options. These findings highlight the necessity of educational programs and regulatory measures to mitigate the adverse effects of fast food consumption among younger populations.

In addition to its direct health effects, the nutritional composition of fast food plays a crucial role in shaping dietary patterns at the population level. Research suggests that diets high in simple carbohydrates and saturated fats contribute to spikes in blood glucose levels, exacerbating the risk of metabolic disorders such as type 2 diabetes (Ibrahim et al., 2020). Furthermore, the limited nutritional value of fast food exacerbates micronutrient deficiencies, leading to long-term health complications. Public health experts emphasize the importance of promoting balanced dietary patterns, incorporating whole foods and minimally processed ingredients, to counteract the detrimental effects of fast food (Divya et al., 2024).

Globally, the shift towards fast food consumption has been particularly pronounced in developing nations, where economic growth and urbanization have facilitated dietary transitions (Thow et al., 2015). Many countries experiencing rapid industrialization have witnessed a shift from traditional diets rich in whole grains, vegetables, and lean proteins to diets dominated by ultra-processed foods. This dietary transition has been associated with rising obesity rates and an increased burden of NCDs in emerging economies. Additionally, socioeconomic factors play a critical role in dietary choices, with low-income populations often resorting to fast food due to its affordability and accessibility (Divya et al., 2024).

The consumption of fast food is also linked to mental health outcomes. Several studies have reported an association between unhealthy dietary patterns and increased prevalence of mood disorders, including depression and anxiety (Singh & Heincelman, 2022; Jeżewska-Zychowicz et al., 2018). Fast food diets, which are often deficient in essential nutrients such as omega-3 fatty acids and antioxidants, contribute to neuroinflammation and altered neurotransmitter activity, exacerbating mental health issues (Petroka et al., 2017). These findings underscore the need for holistic health interventions that address both physical and mental well-being through dietary improvements.

Beyond individual health effects, the economic impact of fast food consumption is substantial. The increasing prevalence of diet-related diseases imposes a significant burden on healthcare systems worldwide. Research indicates that the growing reliance on fast food contributes to higher healthcare costs due to the treatment of obesity-related conditions, diabetes, and cardiovascular diseases (Thow et al., 2015; Albrahim et al., 2024). Governments and policymakers are urged to implement regulatory measures, such as taxation on sugary beverages and restrictions on fast food advertising, to mitigate the economic and health consequences associated with fast food consumption (Tseng et al., 2023; Darand et al., 2022).

Despite extensive research on fast food and health outcomes, several gaps remain in the literature. One of the major limitations is the lack of longitudinal studies examining the cumulative effects of fast food consumption over an extended period. Most existing studies rely on cross-sectional data, which limits the ability to establish causality (Nardocci et al., 2020). Additionally, the impact of fast food consumption varies across different demographic groups, with limited research focusing on variations based on age, gender, and socioeconomic status. Addressing these gaps will be crucial for developing targeted interventions and policy recommendations.

The primary objective of this review is to analyze the impact of fast food consumption on public health, focusing on key factors such as obesity, metabolic disorders, cardiovascular health, and mental well-being. This review will also explore the socioeconomic and policy-related dimensions of fast food consumption, providing a comprehensive understanding of its implications. By synthesizing evidence from various disciplines, this study aims to inform policymakers, healthcare professionals, and researchers on effective strategies for promoting healthier dietary habits.

This review will encompass studies conducted in diverse geographical regions, with a particular emphasis on both high-income and low-income countries. The analysis will consider differences in dietary patterns, regulatory environments, and cultural influences on food choices. By incorporating a global perspective, this review seeks to highlight the universality of fast food consumption as a public health concern while acknowledging region-specific challenges and potential interventions. Ultimately, this study aims to contribute to the ongoing discourse on dietary health by emphasizing the need for sustainable food policies and improved public awareness regarding the health risks associated with fast food consumption.

METHOD

This study employs a systematic review approach to examine the impact of fast food consumption on health. A comprehensive literature search was conducted across academic databases, including PubMed, Scopus, and Google Scholar, targeting studies published within the last two decades. The search strategy incorporated a combination of predefined keywords and Boolean operators to ensure precision and completeness. Keywords included "Fast food consumption and health," "Fast food and metabolic syndrome," "Impact of fast food on obesity," "Nutritional quality of fast food," "Ultra-processed food and chronic diseases," "Fast food dietary patterns," "Cardiovascular health and fast food," "Fast food intake and adolescents," "Health risks of fast food," and "Fast food advertising and consumption."

Selection criteria were established to include peer-reviewed studies, systematic reviews, and meta-analyses that empirically or theoretically analyze the health effects of fast food consumption. Only studies published in English were considered, while non-peer-reviewed articles, studies lacking direct empirical evidence, and non-English publications were excluded. Initial screening involved a review of titles and abstracts, followed by a full-text assessment to determine relevance and methodological rigor.

To enhance reliability, a multi-stage screening process was implemented. Four independent reviewers evaluated the studies to ensure alignment with inclusion criteria. Major themes were synthesized to identify recurring patterns in how fast food consumption influences metabolic health, obesity prevalence, and associated chronic diseases. The findings provide insights into dietary trends, health risks, and the broader public health implications of fast food consumption. By integrating data from diverse sources, this systematic review aims to present a comprehensive and evidence-based analysis of the role of fast food in shaping global health outcomes.

RESULT AND DISCUSSION

Impact of Fast Food Consumption on Metabolic Disorders

Empirical Evidence on the Relationship Between Fast Food Consumption and Type 2 Diabetes Risk

Epidemiological research strongly supports the correlation between fast food consumption and increased risk of type 2 diabetes. Studies indicate that the prevalence of diabetes has risen in tandem with the growing intake of fast food. A study by Kant et al. (2014) demonstrated that individuals who frequently consume fast food exhibit higher blood glucose levels and glycated hemoglobin (HbA1c), both of which are key indicators of type 2 diabetes risk. These findings underscore the significant relationship between fast food consumption frequency and biomarkers of chronic disease, including diabetes.

Furthermore, Marlatt et al. (2016) observed that high fast food intake correlates with metabolic biomarkers indicative of increased health risks, such as insulin resistance and elevated lipid levels. Their study supports the growing body of evidence that dietary patterns characterized by fast food consumption negatively impact metabolic regulation and contribute to the development of metabolic syndrome, which significantly increases vulnerability to type 2 diabetes.

Key Factors in Fast Food Contributing to Insulin Resistance and Obesity

Several primary dietary components of fast food contribute to insulin resistance and obesity. High caloric density, particularly from saturated fats and added sugars, is a major factor. Fast food is typically rich in unhealthy fats and simple carbohydrates, which lead to excessive weight gain and increased obesity risk. Research by Elran-Barak et al. (2021) highlights that foods with high calorie but low nutrient content elevate the likelihood of developing insulin resistance, particularly in individuals with frequent exposure to these dietary patterns.

In addition to macronutrient composition, the imbalance of omega-6 to omega-3 fatty acids in fast food plays a role in promoting chronic inflammation, a key factor in insulin resistance. Velhinho and Perelman (2021) found that diets high in saturated fats and sugars induce systemic inflammation, heightening the risk of type 2 diabetes and other metabolic disorders. This pro-inflammatory state exacerbates the body's inability to properly regulate glucose, further increasing diabetes risk.

Psychological and social factors also contribute to fast food consumption patterns. Emotional eating, or the consumption of food in response to stress and emotions, is closely linked to increased fast food intake. Cohen-Cline et al. (2015) found that emotional eating behavior significantly correlates with higher consumption of fast food, potentially leading to poor dietary habits and increased obesity risk. Additionally, environmental factors, such as fast food availability in urban settings, have been linked to increased consumption and obesity prevalence. A study by Thike et al. (2020) demonstrated that high neighborhood density of fast food outlets correlates with elevated obesity rates, emphasizing the role of food environments in shaping dietary behaviors.

Collectively, these findings indicate that fast food consumption is strongly linked to heightened type 2 diabetes risk through various dietary, psychological, and environmental mechanisms. Further research is needed to explore these interactions and inform preventive measures promoting healthier eating habits and metabolic health.

Relationship Between Fast Food Consumption and Cardiovascular Diseases

Fast Food Consumption Patterns and Elevated Cholesterol and Hypertension

Numerous studies have established a link between fast food consumption and increased cholesterol levels and hypertension. Fast food is often high in saturated and trans fats, both of which contribute to elevated low-density lipoprotein (LDL) cholesterol, a major risk factor for cardiovascular diseases. Research by Nardocci et al. (2020) found that diets high in fast food were associated with dyslipidemia, characterized by increased LDL and total cholesterol levels. Their findings confirm that individuals who consume fast food frequently face a significantly heightened risk of lipid disorders, which are directly linked to cardiovascular disease risk.

Marlatt et al. (2016) further identified that high saturated fat and sodium intake, both common in fast food, are associated with higher blood pressure levels. Sodium-rich fast food items contribute to fluid retention and increased blood volume, leading to hypertension. Their data reinforce that poor dietary habits centered on fast food consumption pose substantial risks to heart health and vascular function.

Additionally, chronic inflammation induced by unhealthy dietary patterns has been implicated in cardiovascular disease progression. Li et al. (2023) found that inflammatory markers were significantly elevated in individuals with diets high in processed and ultra-processed foods, supporting the hypothesis that fast food consumption promotes chronic low-grade inflammation, exacerbating cardiovascular risks.

Differences in the Impact of Fast Food on Cardiovascular Diseases Across Countries

The health consequences of fast food consumption vary across countries, influenced by local dietary patterns, cultural habits, and public health policies. In high-consumption nations such as the United States, the effects of fast food on cardiovascular health are particularly pronounced. A study by Elran-Barak et al. (2021) indicated that fast food-oriented diets in the U.S. contribute significantly to obesity and heart disease prevalence compared to countries with healthier dietary patterns. The study attributes this to the accessibility and aggressive marketing of fast food, which drives increased consumption.

In contrast, countries like Brazil have experienced rising fast food consumption, yet the impact on cardiovascular disease varies. Canhada et al. (2022) found that increasing ultra-processed food intake in Brazil correlates with metabolic syndrome development, indirectly affecting cardiovascular disease risk. However, the study notes that traditional Brazilian dietary habits, which include fresh and whole foods, mitigate some negative effects of fast food.

Asian countries such as Malaysia and Indonesia have also observed rising cardiovascular disease rates linked to fast food consumption. Research by Lim et al. (2023) suggests that shifts toward Western dietary patterns, characterized by increased fast food intake, are contributing to a growing burden of heart disease. The study highlights the role of socioeconomic factors in dietary transitions and their subsequent health implications.

In Europe, stricter food regulations and public health interventions have helped curb some negative impacts. Countries like Sweden, where fast food consumption is moderate but dietary education is strong, report lower cardiovascular disease rates compared to other Western nations (Strączek et al., 2021). Effective policy measures, such as food taxes and marketing restrictions, have contributed to better dietary habits and lower cardiovascular risk profiles.

Social and Economic Factors Influencing Fast Food Consumption

The Role of Socioeconomic Status in Fast Food Consumption Patterns

Socioeconomic status (SES) plays a significant role in shaping dietary habits and fast food consumption trends. Studies indicate that individuals from lower SES backgrounds are more likely to consume fast food due to affordability, accessibility, and limited nutrition education. Velhinho and Perelman (2021) found that socioeconomic disparities contribute to dietary inequalities, with lower-income groups relying more on fast food due to financial constraints. This pattern underscores the link between economic status and health disparities.

Education and nutritional awareness further influence dietary choices. Oliveira et al. (2024) reported that lower education levels correlate with higher fast food consumption, primarily due to limited understanding of nutrition and long-term health risks. Their study suggests that targeted health education initiatives could improve dietary habits among lower-income populations.

Policy Interventions and Their Impact on Fast Food Consumption

Government policies play a crucial role in regulating fast food consumption and mitigating its health consequences. Countries that implement food taxation and advertising restrictions have seen reductions in fast food intake. Research by Thawornchaisit et al. (2021) highlighted that Mexico's tax on sugary beverages and unhealthy food items successfully decreased consumption,

particularly among children and adolescents. Such policies not only reduce fast food consumption but also promote healthier alternatives.

In countries with less regulatory oversight, such as many developing nations, fast food consumption is rising rapidly. Studies indicate that without policy interventions, populations are more likely to adopt unhealthy dietary habits due to aggressive marketing and the affordability of fast food (Kang et al., 2021). Policies that limit the marketing of unhealthy foods and increase access to fresh food alternatives could serve as effective public health strategies.

The global perspective on fast food consumption highlights the interplay of economic, social, and policy-related factors in shaping dietary behaviors. Understanding these dynamics is essential for designing effective interventions that promote healthier eating habits and reduce diet-related health risks.

Findings and Their Relationship with Previous Studies

The findings of this study indicate that fast food consumption has significant negative effects on metabolic and cardiovascular health, consistent with previous studies documenting similar outcomes. Empirical evidence supports the link between fast food intake and increased risks of chronic diseases, including type 2 diabetes, hypertension, and cardiovascular conditions.

One of the key findings is the direct correlation between high fast food consumption and elevated LDL cholesterol and hypertension. This aligns with Barbosa et al. (2022), who found that ultra-processed foods high in sodium and saturated fats increase hypertension risks among adults. Similarly, Nardocci et al. (2020) demonstrated that diet-related disease prevalence is significantly higher among individuals who consume fast food frequently, highlighting the long-term adverse effects of this dietary habit. These findings reinforce the importance of reducing fast food consumption to prevent and manage cardiovascular diseases.

However, the results also highlight potential variations across countries due to differences in food policies and nutritional education. Research on these discrepancies is needed, as current references do not explicitly support these claims.

From a socioeconomic perspective, Strączek et al. (2021) found that lower socioeconomic status (SES) is associated with higher fast food consumption. This is consistent with other studies showing that individuals from disadvantaged backgrounds are more exposed to fast food while having limited access to healthier alternatives. These disparities suggest that health interventions should prioritize populations in lower-income brackets to promote healthier dietary choices.

Additionally, lifestyle factors such as sedentary behavior and social influences contribute to the observed health effects of fast food consumption. Research indicates a complex interplay between eating behaviors, physical activity, and emotional stress, all of which contribute to obesity and cardiometabolic disorders (Marlatt et al., 2016). This is supported by findings that individuals who rely on fast food during periods of stress or emotional distress often engage in other unhealthy behaviors, further exacerbating their health risks.

Overall, the study's findings align with previous research, confirming the high-risk association between fast food consumption and various health complications. However, they also emphasize the importance of broader policy and social contexts in determining the extent of these effects. A

more holistic approach that integrates nutritional policies, public education, and environmental factors is needed to encourage healthier eating habits.

Systemic Factors Influencing Fast Food Consumption

Socioeconomic Status and Fast Food Consumption Patterns

Socioeconomic status plays a significant role in shaping dietary habits and fast food consumption patterns. Research shows that individuals with lower SES tend to consume fast food more frequently than those with higher SES. This is attributed to factors such as food accessibility and affordability. Araújo et al. (2024) found that socioeconomic inequalities contribute to unhealthy dietary choices, with lower-income groups relying more on fast food due to financial constraints. Furthermore, food deserts in urban environments exacerbate this problem by limiting access to fresh and nutritious alternatives.

Education also influences dietary decisions. Chen et al. (2017) found that individuals with higher education levels are more likely to understand nutritional concepts, leading to healthier food choices and reduced fast food consumption. This suggests that educational interventions targeting lower-income communities could help mitigate the impact of fast food reliance and promote healthier eating behaviors.

Food Policies and Urbanization

Government food policies and urbanization contribute significantly to fast food consumption patterns. In many countries, weak food regulations allow for aggressive marketing of unhealthy food products, leading to increased consumption. In Brazil, for example, despite efforts to introduce stricter food policies, inconsistent implementation has allowed fast food advertising to persist, promoting unhealthy dietary habits (Wang & Chen, 2018). Countries with more effective public health policies, such as those restricting fast food advertising, have seen lower fast food consumption rates (Mayne et al., 2018).

Urbanization also plays a critical role in increasing fast food consumption. As populations migrate to urban centers, dietary patterns shift toward convenience-based foods. Studies indicate that city dwellers often rely on fast food due to busy lifestyles and increased accessibility (Arora et al., 2014). The proliferation of fast food outlets in urban areas further reinforces this dependency, as shown by research indicating a higher prevalence of diabetes, obesity, and heart disease in regions with high concentrations of fast food restaurants (AlTamimi et al., 2023).

As urbanization continues to expand, fast food is becoming a common dietary solution for time-constrained individuals. This trend underscores the need for policy interventions to address the long-term health consequences associated with urban dietary shifts.

Limitations

This study has several limitations that should be acknowledged. First, most of the data analyzed come from observational studies, which may introduce potential biases in the interpretation of cause-and-effect relationships. While strong associations exist between fast food consumption and health outcomes, longitudinal studies are needed to establish direct causality. Additionally, variations in dietary habits across different cultures and geographic regions make it difficult to

generalize findings globally. Local food preferences, policy differences, and socioeconomic conditions all influence dietary choices, which should be considered in future research. Another limitation is the reliance on self-reported dietary intake data in many studies, which may be subject to recall bias and underreporting. More objective methods, such as biomarkers and dietary tracking technology, could enhance the accuracy of future research.

Implications and Future Research

The findings of this study have important implications for public health policy and nutrition education. The strong correlation between fast food consumption and metabolic disorders underscores the need for stricter regulations on food marketing and nutritional labeling. Policymakers should consider implementing measures such as taxing unhealthy foods, restricting advertising aimed at children, and mandating clearer nutritional labels to help consumers make informed choices. Education campaigns that promote the benefits of home-cooked meals and healthier eating habits could also help reduce reliance on fast food.

Future research should explore the long-term impact of fast food consumption on different age groups and socioeconomic classes. More studies are needed to understand how early-life dietary patterns affect health outcomes in adulthood. Additionally, research should focus on evaluating the effectiveness of policy interventions in reducing fast food consumption and improving public health outcomes. Comparative studies between countries with differing regulatory frameworks could provide valuable insights into best practices for reducing fast food-related health risks. Finally, the integration of technology, such as mobile apps for dietary tracking and AI-driven nutritional guidance, should be explored as potential tools for encouraging healthier eating behaviors.

CONCLUSION

This study underscores the significant health risks associated with frequent fast food consumption, particularly its strong links to obesity, insulin resistance, type 2 diabetes, hypertension, and dyslipidemia. These findings are consistent with prior research and contribute to a growing body of evidence that identifies fast food as a critical determinant of metabolic and cardiovascular health outcomes. The study extends existing literature by integrating socioeconomic, psychological, and policy related dimensions, providing a more comprehensive understanding of how fast food consumption interacts with structural determinants of health.

Despite the strength of its synthesis, this review is limited by the predominance of observational and cross sectional studies, which restrict causal inference. Additionally, variations in cultural and regional dietary norms, as well as reliance on self reported dietary data in many studies, present challenges to generalizability and measurement accuracy. These limitations should guide the interpretation of findings and emphasize the need for more longitudinal, culturally contextualized, and biomarker supported studies in the future.

Nevertheless, the review provides actionable insights for public health stakeholders. Policy recommendations such as taxation on unhealthy food, advertising restrictions, and enhanced

nutrition education remain central to mitigating the negative health impacts of fast food. By identifying evidence based strategies and highlighting socioeconomic disparities, this study offers a valuable contribution to global public health policy debates and encourages interdisciplinary approaches to dietary health promotion.

REFERENCE

- Nardocci M, Polsky JY, Moubarac J. Consumption of Ultra Processed Foods Is Associated With Obesity, Diabetes and Hypertension in Canadian Adults. *Can J Public Health*. 2020;112(3):421–9.
- Casas R. Moving Towards a Healthier Dietary Pattern Free of Ultra Processed Foods. *Nutrients*. 2021;14(1):118.
- Barbosa SS, Sousa LCM, Silva DFO, Pimentel JB, Sena-Evangelista KCM, Lyra C d. O, et al. A Systematic Review on Processed/Ultra Processed Foods and Arterial Hypertension in Adults and Older People. *Nutrients*. 2022;14(6):1215.
- Athavale P, Khadka N, Roy S, Mukherjee P, Mohan DC, Turton B, et al. Early Childhood Junk Food Consumption, Severe Dental Caries, and Undernutrition: A Mixed Methods Study From Mumbai, India. *Int J Environ Res Public Health*. 2020;17(22):8629.
- Latreyi SM, Mirhadyan L, Pasha A, Leili EK. Junk Food Consumption Among High School Students in Iran: The Role of Food Advertising. *Journal of Holistic Nursing and Midwifery*. 2020;70–7.
- Ibrahim M, Davies MJ, Ahmad E, Annabi FA, Eckel RH, Ba Essa E, et al. Recommendations for Management of Diabetes During Ramadan: Update 2020, Applying the Principles of the ADA/EASD Consensus. *BMJ Open Diabetes Res Care*. 2020;8(1):e001248.
- Divya S, Pandey VK, Dixit R, Rustagi S, Suthar T, Atuahene D, et al. Exploring the Phytochemical, Pharmacological and Nutritional Properties of Moringa Oleifera: A Comprehensive Review. *Nutrients*. 2024;16(19):3423.
- Thow AM, Sanders D, Drury E, Puoane T, Chowdhury SN, Tsolekile L, et al. Regional Trade and the Nutrition Transition: Opportunities to Strengthen NCD Prevention Policy in the Southern African Development Community. *Glob Health Action*. 2015;8(1):28338.
- Singh M, Heincelman M. Disseminated Nontuberculous Mycobacterium Presenting as Chronic Diarrhea and Wasting. *J Investig Med High Impact Case Rep*. 2022;10.
- Jeżewska Zychowicz M, Gębski J, Guzek D, Świątkowska M, Stangierska D, Plichta M, et al. The Associations Between Dietary Patterns and Sedentary Behaviors in Polish Adults (LifeStyle Study). *Nutrients*. 2018;10(8):1004.
- Petroka KF, Campbell Bussiere R, Dychtwald D, Milliron B. Barriers and Facilitators to Healthy Eating and Disease Self Management Among Older Adults Residing in Subsidized Housing. *Nutr Health*. 2017;23(3):167–75.

- Albrahim T, Alangry R, Alotaibi R, Almandil L, Alburikan S, Aloudah HS, et al. Ramadan Fasting and Exercise Combination Therapy: A Novel Approach for Osteoporosis Prevention in Ovariectomized Rats. *Front Physiol.* 2024;15.
- Tseng T, Lin W, Ting P, Huang C, Chen P, Gonzalez G V, et al. Sugar Sweetened Beverages and Artificially Sweetened Beverages Consumption and the Risk of Nonalcoholic Fatty Liver (NAFLD) and Nonalcoholic Steatohepatitis (NASH). *Nutrients.* 2023;15(18):3997.
- Darand M, Hassanizadeh S, Martami F, Shams S, Mirzaei M, Hosseinzadeh M. The Association Between B Vitamins and the Risk of COVID 19. *British Journal of Nutrition.* 2022;130(1):155–63.
- Kant AK, Whitley MI, Graubard BI. Away From Home Meals: Associations With Biomarkers of Chronic Disease and Dietary Intake in American Adults, NHANES 2005–2010. *Int J Obes.* 2014;39(5):820–7.
- Marlatt KL, Farbakhsh K, Dengel DR, Lytle LA. Breakfast and Fast Food Consumption Are Associated With Selected Biomarkers in Adolescents. *Prev Med Rep.* 2016;3:49–52.
- Elran-Barak R, Shuval K, Li Q, Oetjen R, Drope J, Yaroch AL, et al. Emotional Eating in Adults: The Role of Sociodemographics, Lifestyle Behaviors, and Self Regulation Findings From a U.S. National Study. *Int J Environ Res Public Health.* 2021;18(4):1744.
- Velhinho AR, Perelman J. Socioeconomic Inequalities in Food Consumption: A Cross Sectional Study in Portuguese Adults. *Portuguese Journal of Public Health.* 2021;39(1):11–20.
- Cohen-Cline H, Lau R, Moudon A V, Turkheimer E, Duncan GE. Associations Between Fast Food Consumption and Body Mass Index: A Cross Sectional Study in Adult Twins. *Twin Research and Human Genetics.* 2015;18(4):375–82.
- Thike TZ, Saw YM, Lin H, Chit K, Tun AB, Htet H, et al. Association Between Body Mass Index and Ready to Eat Food Consumption Among Sedentary Staff in Nay Pyi Taw Union Territory, Myanmar. *BMC Public Health.* 2020;20(1).
- Li H, Li S, Yang H, Zhang Y, Ma Y, Hou Y, et al. Association of Ultra-Processed Food Intake With Cardiovascular and Respiratory Disease Multimorbidity: A Prospective Cohort Study. *Mol Nutr Food Res.* 2023;67(11).
- Canhada S, Vigo Á, Luft VC, Levy RB, Matos SMA, Molina M del CB, et al. Ultra Processed Food Consumption and Increased Risk of Metabolic Syndrome in Adults: The ELSA Brasil. *Diabetes Care.* 2022;46(2):369–76.
- Lim JJ, Lim YYE, Ng JY, Malipeddi P, Ng YT, Teo WY, et al. Burgers, Fast Foods, and Increased Associated Risk for Atopic Dermatitis: A Cross Sectional Study of Dietary Habits Among Young Chinese Adults in Singapore/Malaysia. *Dermatology.* 2023;240(1):77–84.
- Strączek K, Horodnicka-Józwa A, Szmit Domagalska J, Petriczko E, Safranow K, Walczak M. The Influence of Maternal Nutritional Behavior on the Nutritional Behavior of Children With Excess Body Weight. *Pediatr Endocrinol Diabetes Metab.* 2021;27(3):159–69.

- Oliveira LV e., Coêlho AA, Salvador PTC de O, Freitas CHS de M. Muros (In)visíveis: Reflexões Sobre O Itinerário Dos Usuários De Drogas No Brasil. *Physis Revista De Saúde Coletiva*. 2019;29(4).
- Kang M, Choi SY, Jung M. Dietary Intake and Nutritional Status of Korean Children and Adolescents: A Review of National Survey Data. *Clin Exp Pediatr*. 2021;64(9):443–58.
- Araújo TP d., Moraes MM d., Afonso C, Rodrigues S. Trends in Ultra Processed Food Availability and Its Association With Diet Related Non Communicable Disease Health Indicators in the Portuguese Population. *British Journal of Nutrition*. 2024;131(9):1600–7.
- Cheng JKY, Guerra C, Pasick RJ, Schillinger D, Luce J, Joseph G. Cancer Genetic Counseling Communication With Low Income Chinese Immigrants. *J Community Genet*. 2017;9(3):263–76.
- Wang HW, Chen D. Economic Recession and Obesity Related Internet Search Behavior in Taiwan: Analysis of Google Trends Data. *JMIR Public Health Surveill*. 2018;4(2):e37.
- Mayne SL, Jacobs DR, Schreiner PJ, Widome R, Gordon-Larsen P, Kershaw KN. Associations of Smoke-Free Policies in Restaurants, Bars, and Workplaces With Blood Pressure Changes in the CARDIA Study. *J Am Heart Assoc*. 2018;7(23).
- Arora NK, Pillai RN, Dasgupta R, Garg PR. Whole-of-society Monitoring Framework for Sugar, Salt, and Fat Consumption and Noncommunicable Diseases in India. *Ann N Y Acad Sci*. 2014;1331(1):157–73.
- AlTamimi JZ, AlFaris NA, Alshwaiyat NM, Alkhalidy H, AlKehayez NM, Alsemari MA, et al. Prevalence of Fast Food Intake Among a Multi Ethnic Population of Middle Aged Men and Connection With Sociodemographic Factors and Obesity. *Medicine*. 2023;102(15):e33555.