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The Digital Food Environment and Ultra-Processed Food Consumption Among Generation Z

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ABSTRACT

The digital food environment has transformed Generation Z's food consumption behavior through social media, food delivery apps, digital marketing, and algorithm-based recommendation systems. This narrative review aims to analyze the relationship between the digital food environment and the consumption of ultra-processed foods (UPFs) among Generation Z. A narrative literature review was conducted in the PubMed and SpringerLink databases for English-language articles published between 2021 and 2026. A total of 16 articles meeting the inclusion criteria were analyzed narratively. The results of the synthesis indicate that exposure to digital advertisements, food influencer promotions, food delivery apps, and algorithmic personalization increases food cravings, impulsive purchasing, and preferences for UPF. High UPF consumption is associated with a decline in diet quality and an increased risk of obesity, metabolic disorders, cardiovascular disease, and mental health issues. Improving digital nutrition literacy and regulating digital food marketing are necessary to support the creation of a healthier digital food environment for Generation Z.

INTRODUCTION

Generation Z is a demographic group consisting of people born between approximately 1997 and 2012 and is known as the first generation to grow up entirely in the digital age[1]. Generation Z has grown accustomed to using the internet, smartphones, social media, and various digital platforms in their daily lives. These characteristics have given them a high level of digital literacy and made technology an integral part of their activities from learning and working to interacting with others and even meeting their food needs. Generation Z spends relatively more time online than other age groups, resulting in increased exposure to various forms of digital marketing[2,3].

Advances in digital technology have significantly changed the nature of food consumption habits[4]. Whereas access to food was previously dominated by physical environments such as

traditional markets, supermarkets, or restaurants, people are now confronted with the concept of the digital food environment that is, a food environment shaped by digital media. The digital food environment encompasses various platforms that influence food selection, purchase, and consumption, such as online food ordering apps, social media, delivery services, food influencers, digital ads, algorithm-based promotions, and personalized food recommendation systems. The digital food environment provides easy access to a wide variety of food options anytime and anywhere, making the process of obtaining food much faster[5].

For Generation Z, social media serves not only as a means of communication but also as a primary source of information and culinary trends[6]. Exposure to food content through platforms such as Instagram, TikTok, YouTube, and Facebook can shape preferences, increase the desire to try certain foods (food cravings), and influence purchasing decisions. Digital marketing strategies that utilize eye-catching visuals, reviews from food influencers, discount promotions, flash sales, free shipping, and push notifications on food delivery apps further enhance the appeal of the promoted foods[7]. In addition, social media algorithms continuously display content tailored to users' search history and preferences, resulting in increasingly frequent and repetitive exposure to food advertisements[8].

On the other hand, most of the foods promoted through digital platforms are fast food, sugary drinks, high-calorie snacks, and various ultra-processed foods (UPFs)[9]. According to the NOVA classification, ultra-processed foods are industrially formulated food products that contain few or no whole food ingredients and are produced using various additives such as preservatives, sweeteners, colorings, flavor enhancers, emulsifiers, and other additives to improve their taste, texture, and shelf life[10]. UPF's practical characteristics, its strong flavor, wide availability, and aggressive marketing make it a perfect fit for Generation Z's lifestyle, which prioritizes speed, convenience, and ease[11].

The ease of access through online food ordering apps is further driving the consumption of UPF[2]. Features such as automatic location search, digital payments, fast delivery services, loyalty programs, and menu recommendations based on purchase history encourage more frequent impulse food purchases[12]. In addition, price promotions, value packs, and real-time promotional notifications can encourage unplanned food purchases. This situation reduces geographical and time-related barriers to obtaining food, making it easier to consume UPFs than to prepare fresh meals at home[13].

The rise in UPF consumption is a serious concern in the field of public health due to the link between high UPF consumption and an increased risk of obesity, type 2 diabetes, hypertension, cardiovascular disease, dyslipidemia, certain types of cancer, mental health disorders, and even an increased risk of mortality. Among adolescents and young adults, consumption patterns established early in life are likely to persist into adulthood, thereby increasing the burden of noncommunicable diseases in the future[14].

Given these circumstances, this narrative review aims to identify and analyze the scientific evidence regarding the relationship between the digital food environment and the consumption of ultra-processed foods among Generation Z. The findings of this study are expected to provide insight into the various components of the digital food environment that contribute to UPF consumption behavior, while also serving as a foundation for the development of intervention strategies and policies that support the creation of a healthier digital food environment.

METHODS

This study employs a narrative literature review, a method of literature review aimed at synthesizing various research findings on the relationship between the digital food environment and the consumption of ultra-processed foods among Generation Z. A narrative review was chosen because it can integrate various types of scientific evidence from a range of research designs, thereby providing a broader understanding of this emerging phenomenon.

The literature review was conducted using several international scientific databases, including PubMed and SpringerLink. The search process utilized a combination of keywords in English, such as “digital food environment,” “food delivery platform,” “ultra-processed food,” and “Generation Z.” These keywords were used either separately or in combination with one another. The articles included in this study met the following inclusion criteria: (1) original research articles or review articles published in reputable scientific journals; (2) published between 2021 and 2026 to reflect the latest developments; (3) written in English; (4) discussing one or more components of the digital food environment, such as social media, online food ordering apps, digital marketing, food influencers, or digital advertising; as well as (5) examining the relationship between these components and dietary behavior, particularly the consumption of ultra-processed foods among adolescents or young adults representing Generation Z. The exclusion criteria include articles for which the full text is not available and publications that are not relevant to the research topic.

All articles that met the criteria were then evaluated based on topic relevance, research objectives, research design, the components of the digital food environment examined, indicators of ultra-processed food consumption, and key findings. The data obtained were then analyzed narratively by grouping them into major themes, including the characteristics of the digital food environment, the mechanisms through which it influences consumption behavior, the factors that moderate these relationships, and their implications for public health. The results of this synthesis are presented descriptively to provide an overview of the latest scientific evidence and to identify research gaps that require further study.

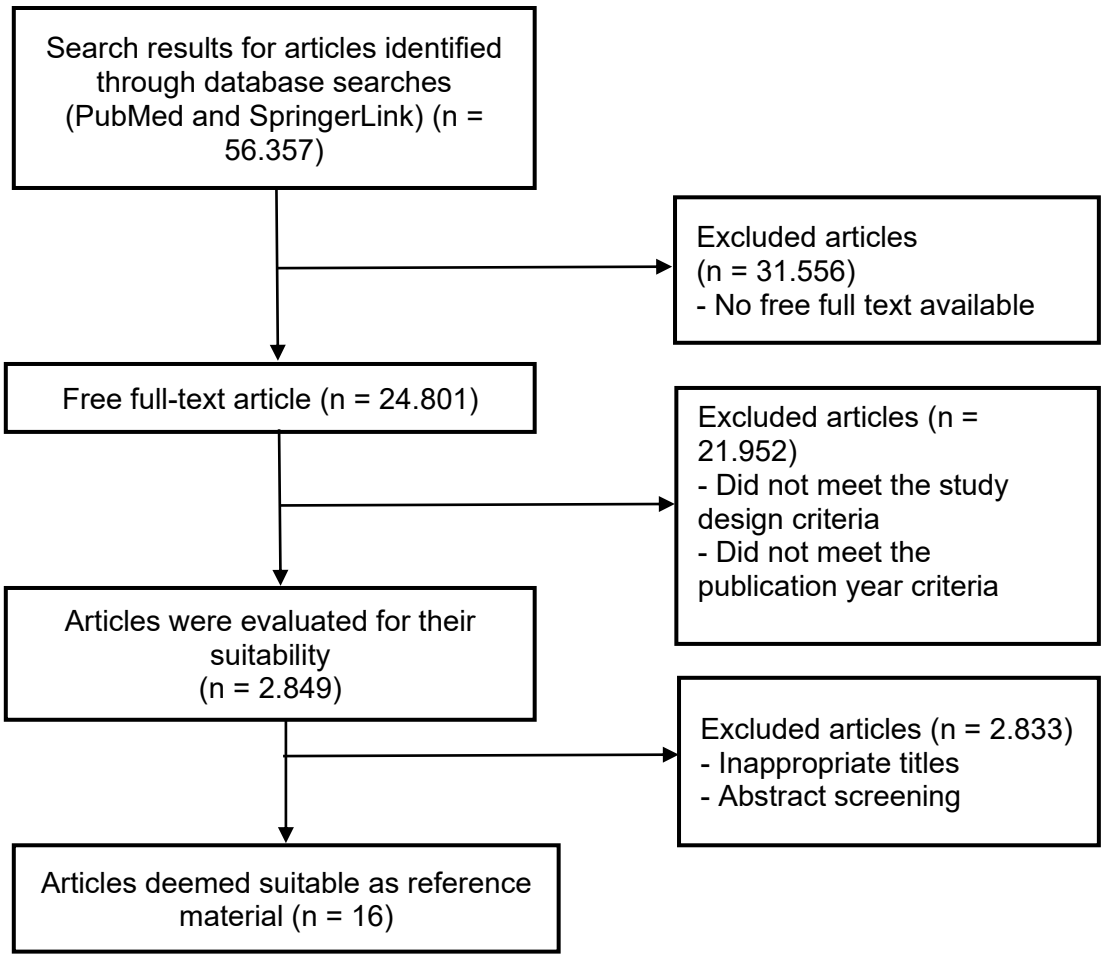

Figure 1. Flowchart for a Narrative Review Search

RESULTS

Table 1. Article Data Mapping Results

No	Researcher & Year	Article Title	Journal & Database	Study Design	Conclusion
1	Ares, Antúnez, Alcaire, Natero, Gugliucci, Machín, de León, & Otterbring (2025)	Associations between exposure to digital food marketing and food consumption in adolescence: a cross-sectional study in an emerging country	BMC Public Health (PubMed)	Cross-sectional	Exposure to digital food marketing and overall social media use are associated with higher consumption of ultra-processed foods and fast food, as well as lower consumption of fruits and vegetables.
2	Nandwani, Mahajan, Chan, Chui, Muley, & Lo (2025)	Social Media Usage and Advertising Food-Related Content: Influence on Dietary Choices of Gen Z	Nutrients (PubMed)	Cross-sectional	YouTube and Instagram are the main drivers of food content consumption; exposure to fast-food ads and food delivery platforms is significantly associated with food cravings and impulsive ordering among Gen Z.
3	Botelho, Freitas, Camara, de Almeida, Gonçalves, Horta, Canella, & Cardoso (2023)	Digital marketing of online food delivery services in a social media platform before and during COVID-19 pandemic in Brazil	Public Health Nutrition (PubMed)	Cross-sectional	Food delivery platforms predominantly promote ultra-processed products through various social media-based digital marketing strategies.
4	Barros, de Paula Matos, Rodrigues, da Costa, & Horta (2025)	Food digital marketing on social media: trends and strategies of Brazil's leading	Frontiers in Nutrition (PubMed)	Studi longitudinal eksploratif	Food delivery apps consistently promote unhealthy foods more than healthy ones, using persuasive strategies that have become

		meal delivery app			increasingly sophisticated over time, potentially undermining public health efforts.
5	Matos, Rodrigues, Duarte, & Horta (2023)	A Scoping Review of Observational Studies on Food and Beverage Advertising on Social Media: A Public Health Perspective	International Journal of Environmental Research and Public Health (PubMed)	Scoping review	UPF companies actively use interactive posts, giveaways and promotions, and promotional characters on social media to boost consumption of ultra-processed products.
6	Tsochantaridou, Sergentanis, Grammatikopoulou, Merakou, Vassilakou, & Kornarou (2023)	Food Advertisement and Dietary Choices in Adolescents: An Overview of Recent Studies	Children/MDPI (PubMed)	Narrative Review	Exposure to advertisements for unhealthy foods increases adolescents' cravings and intention to consume such foods; this effect is amplified by peer pressure and influencers.
7	Lafontaine, Hanson, & Wild (2025)	The impact of the social media industry as a commercial determinant of health on the digital food environment for children and adolescents: a scoping review	BMJ Global Health (PubMed)	Scoping review	The social media industry acts as a commercial determinant of health that shapes the digital food environment; self-regulation has proven ineffective.
8	Osaili, Al-Nabulsi, Taybeh, Cheikh Ismail, & Saleh (2023)	Healthy food and determinants of food choice on online food delivery applications	PLoS ONE (PubMed)	Cross-sectional	Price, food presentation, and the availability of healthy options are key factors influencing food choices on OFDA; the online food environment is

					considered less healthy.
9	Cheikh Ismail, Osaili, Shanan, dkk. (2024)	A cross-sectional study on online food delivery applications (OFDAs) in the UAE: use and perceptions of healthy food availability among university students	Journal of Nutritional Science (PubMed)	Cross-sectional	More than half of active college students use OFDA, with fast food being the most popular choice; OFDA is believed to increase appetite and food intake.
10	Eu & Sameeha (2021)	Consumers' Perceptions of Healthy Food Availability in Online Food Delivery Applications (OFD Apps) and Its Association With Food Choices Among Public University Students in Malaysia	Frontiers in Nutrition (PubMed)	Cross-sectional retrospektif	The presence of OFDA increases students' exposure to unhealthy food options, thereby increasing the likelihood of UPF consumption.
11	Giacomini, Scacchi, Ragusa, Prinzivalli, Elhadidy, & Gianino (2024)	Which variables and determinants influence online food delivery consumption among workers and students? (DELICIOUS study)	Frontiers in Public Health (PubMed)	Cross-sectional	OFDs make it easier to access food without cooking, but they predominantly promote processed and calorie-dense foods; younger age is significantly associated with OFD use.
12	Gupta A., Fraser K., & Cameron A.J. (2026)	Rethinking Public Health in the Digital Food Era	International Journal of Behavioral Nutrition and Physical Activity (SpringerLink)	Commentary/Perspective	The article explains that the digital food environment (online grocery, online food delivery, and meal-kit services) has transformed the way

					people obtain food. The author emphasizes the need for public health policies to regulate the digital food environment, as this environment has the potential to increase exposure to unhealthy foods, particularly among younger age groups.
13	Bayram H.M. & Ozturkcan A. (2026)	Drivers of Ultra-Processed Food Consumption in Emerging Adults: The Influence of Obesogenic Environment, Hedonic Hunger, and Food Choices	Current Psychology (SpringerLink)	Cross-sectional Study	Perceptions of the obesogenic environment, hedonic hunger, and the quality of food choices are significantly associated with UPF consumption. These three factors account for more than half of the variation in UPF consumption among young adults. These findings are highly relevant for understanding Generation Z's eating behaviors in the digital environment.
14	Laguitan R.V.M. et al. (2026)	Ultra-Processed Foods at the Planetary Nutrition Nexus with Implications for Mental Health, Environmental Footprints and Policy Levers	Discover Public Health (SpringerLink)	Narrative Review	This review shows that the consumption of ultra-processed foods is linked to mental health issues, environmental impacts, and the modern food system. The authors emphasize the importance of regulating marketing

					and the food environment to reduce the consumption of ultra-processed foods.
15	Moodie R. et al. (2026)	Ultra-Processed Foods: Challenging Corporate Power and Promoting Local Food Systems to Reclaim Health	Globalization and Health (SpringerLink)	Policy Commentary	The article discusses how the power of the food industry, digital marketing, and food distribution shape a food environment that encourages the consumption of UPF. The author advocates for policies that restrict the promotion of UPF and strengthen local food systems.
16	Aslan Gonul, B., Caferoglu Akin, Z (2025)	Digital healthy eating literacy: its role in sustainable food choices and mediterranean diet adherence	BMC Public Health (SpringerLink)	Cross-sectional and descriptive study	Digital healthy eating literacy (e-HDL) plays a key role in promoting healthier and more sustainable eating behaviors. Individuals with higher levels of digital healthy eating literacy tend to make more environmentally friendly food choices and adhere more closely to the Mediterranean diet.

DISCUSSION

1. Generation Z

Generation Z is a demographic group born between approximately 1997 and 2012 and known as “digital natives”, a generation that has grown up alongside the development of the internet, smartphones, and various social media platforms since childhood[6]. According to the findings of a study by Nandwani et al. (2025), which indicate that members of Generation Z aged 18–25 spend about 3 hours per day on social media, significantly more than those in the 55–64 age group, who spend only about 1 hour and 46 minutes per day[6]. In addition, another study by Ares et al. (2025) found that 99.5% of participants used at least one digital medium, with average daily digital media usage totaling 5.5 hours[15].

Unlike previous generations, Generation Z uses digital technology at a much higher rate, so that nearly all of their daily activities including communication, entertainment, education, and even meeting their food needs are carried out through digital devices. These characteristics make Generation Z the group most frequently exposed to food-related information and promotions through digital media, as supported by the findings of a study by Ares et al. (2025), which found that 87.6% of participants reported having seen food or beverage advertisements on digital media in the past week, with 39.1% of them experiencing such exposure every day[15].

The widespread use of social media platforms such as Instagram, TikTok, YouTube, Facebook, and other digital platforms means that Generation Z is exposed to images of food almost constantly. In addition to searching for information about food, they also use social media as a reference when making food choices based on trends, influencer reviews, and algorithm driven recommendations. As a result, Generation Z is the demographic most vulnerable to the influence of the digital food environment compared to other age groups[1,2].

2. Digital Food Environment

The digital food environment refers to the entire digital ecosystem that influences how people obtain information, choose, purchase, and consume food through internet-based technology. In this concept map, the digital food environment consists of several key components, namely food delivery apps, online food marketing, food advertising on social media, promotions by influencers and food vloggers, food-related content on digital platforms such as TikTok, Instagram, and Facebook, and personalized ads using artificial intelligence (AI) algorithms, various promotional offers, such as discounts and cashback, as well as convenient digital

payment options[16,17]. Barros et al. (2025) analyzed 12 years (2011–2022) of digital marketing content from Brazil's largest food delivery apps on Facebook and Instagram. The study identified 12 distinct marketing themes that directly represent components of the digital food environment; for example, the "economic benefit" theme (discounts, combo deals, and free shipping) was found in 33.1% of Instagram posts and 26.4% of Facebook posts, the theme of "application differentials" (user-data-based personalization features such as search history, ordering patterns, time, location, and devices used) was found in 38.5% of Instagram posts, significantly higher than on Facebook (19.7%; $p < 0.0001$), as well as the theme of endorsements by public figures (promotions by public figures and influencers), which was far more dominant on Instagram (35.3%) than on Facebook (12.0%; $p < 0.0001$)[18].

Each of these components reinforces the others in creating a food environment that is highly accessible to Generation Z. For example, when someone views viral food content on TikTok, the social media algorithm will continue to show similar content. Next, the food delivery app will provide recommendations for restaurants that sell that food, along with discount promotions and convenient digital payment options. The combination of these various features indirectly enhances the appeal of certain foods, thereby increasing the likelihood of a purchase. This statement is consistent with the findings of a commentary by Gupta, Fraser, & Cameron (2026), which explains that digital marketing techniques on food delivery and online grocery platforms are highly personalized, leveraging consumer demographic data, geographic location, and online browsing and purchase history. The algorithm behind online food delivery apps repeatedly recommends food items that have been purchased before and flags certain food items that tend to be unhealthy. This directly explains why ads in digital media are not merely random promotions, but rather an algorithmic system that deliberately steers consumer preferences[19].

The digital food environment ultimately not only provides access to food, but also actively shapes people's preferences, perceptions, and consumption behaviors through increasingly sophisticated and personalized digital marketing strategies, In line with the findings of Botelho et al. (2023), who state that the digital food environment actively shapes preferences, perceptions, and consumption behaviors not only through product promotions but also through the manipulation of brand imagery that is dynamically adapted to the prevailing social context[20].

3. Increased Food Exposure and Accessibility

High exposure to the digital food environment will increase food exposure and food accessibility that is, the frequency with which a person sees food and the ease with which they

can obtain it. Food exposure occurs through various forms, ranging from appealing food visuals and cooking videos to restaurant reviews and ads that appear repeatedly on social media and digital apps. More than 60% of participants (61.5%) agreed that they had been influenced by social media posts, magazines, TV, or YouTube ads to use food delivery apps[21].

In addition to increasing exposure, the digital food environment also improves food accessibility through delivery services available nearly 24 hours a day, simple ordering systems, restaurants with an ever-wider reach, and fast digital payments. This situation has reduced the various barriers that previously prevented people from buying food. In fact, with just a few taps on a smartphone, food can be delivered directly to the customer's location[22]. This is consistent with the findings of a study by Osaili et al. (2023), which reinforces this picture by finding that delivery time is a significant determinant of food choices (51.0%), and that the speed of this service is the main reason consumers rely on online food delivery apps rather than having to shop for groceries, cook, and clean the kitchen themselves[21].

This ease of access then encourages impulse buying that is, spontaneous food purchases made without prior planning. In addition, the constant stream of promotions and notifications can also trigger emotional eating that is, consuming food in response to emotional states such as stress, boredom, sadness, or a desire for comfort. The findings of a study by Cheikh Ismail et al. (2024) indicate that 57.8% of participants agreed that the use of online food delivery apps has changed their eating habits, particularly in the form of more frequent late-night snacking or eating alone[23].

4. Mechanisms

The relationship between the digital food environment and the consumption of ultra-processed foods is not direct, but rather occurs through various interrelated psychological and behavioral mechanisms. The first mechanism is high exposure to food marketing. Repeated exposure to food advertisements increases brand awareness while fostering a positive perception of the product, making it easier for individuals to remember and choose that food when making a purchase. These findings are supported by a systematic review of 26 observational studies on social media, which identified branding elements (logos, colors, slogans) and brand-in-evidence as one of the eight most frequently studied groups of food advertising strategies on platforms such as Facebook, Instagram, YouTube, and Twitter[24]. In line with this, a review of 19 studies on adolescents found that exposure to television and social media advertisements was consistently associated with high levels of engagement with unhealthy food brands, and even revealed a

pattern in which the longer the duration of exposure, the greater the adolescents' engagement with those brands[25].

The second mechanism is food cue exposure, which involves exposure to visual food stimuli such as photos, videos, or aromas that can increase appetite and the desire to consume certain foods. Food cues are very effective at influencing Generation Z because this group spends a lot of time on social media, which is filled with food related content. This is supported by findings from a study of college students in Istanbul, where food-themed visual content was the most frequently appearing category on users' Instagram feeds (62.4%), indicating high exposure to food cues in students' everyday digital environments[26].

Next is hedonic eating, which is eating behavior driven by the pursuit of pleasure rather than physiological needs. Many ultra-processed foods contain a combination of sweet, salty, and fatty flavors that provide a pleasurable sensation, making them a more frequent choice than healthy foods[27,28]. In addition, there is the convenience factor, the tendency to choose foods that are easily available and require no preparation time. Due to their busy academic and social schedules, Generation Z prefers ready-to-eat meals over cooking for themselves[28].

The next mechanism is impulse buying, which refers to the spontaneous decision to purchase food as a result of digital promotions, discounts, cashback, or app recommendations. This mechanism is supported by a review stating that strategies involving "economic advantages, gifts, or competitions", such as limited time offers, discounts, coupons, and prizes are among the most widely used strategies (found in 14 of 26 studies), particularly on Facebook and in content targeting children and adolescents[29].

5. Food Choice Decision Making

Food choice decision-making is the process by which a person decides what food to consume. For Generation Z, this process is no longer influenced solely by hunger or nutritional needs, but also by various digital factors such as social media ads, influencer recommendations, viral food trends, ease of ordering, price promotions, and reviews from other users[30].

In the digital world, food choices are often made quickly without considering nutritional content. Lower prices due to promotions, the ease of ordering through the app, and appealing food visuals were the primary considerations, rather than the nutritional value of the food. A study of 290 college students found that, of the five food choice motives tested, price and convenience were the most influential factors with the highest average score (4.29 ± 0.76), followed by sensory appeal and mood (4.14 ± 0.79). Conversely, the motivation related to nutrition and health was

actually the least influential factor among the five motivations (3.19 ± 1.00). It can be concluded that nutritional value is not a primary consideration, but rather the least important factor in the food decision-making process in the digital environment[31].

In addition, peer influence through social media also plays a role in shaping consumption norms, as foods that are currently trending tend to be seen as more appealing to try. A study by Eu & Sameeha (2021) measured the motives of “media influence” (promoted in media such as television, radio, and the internet) and “peer influence” (recommended or consumed by friends) as two of the five food choice motives tested. These two factors ranked third and fourth with nearly identical scores (3.30 ± 1.07 and 3.30 ± 1.03), indicating that the influence of the media and the social influence of peers carry equal weight in shaping students’ consumption decisions. Therefore, the food decision-making process serves as a key link between digital exposure and changes in daily consumption patterns[31].

6. Higher Consumption of Ultra-Processed Food

As a result of all the preceding processes, Generation Z tends to consume more ultra-processed foods (UPFs). According to the NOVA classification, UPFs are foods produced through industrial processes using various additives such as sweeteners, colorings, preservatives, emulsifiers, and artificial flavorings designed to enhance taste, shelf life, and convenience[32].

Some examples of UPFs most commonly consumed by Generation Z include sugar-sweetened beverages, fast food, instant noodles, packaged snacks, ready-to-eat frozen meals, processed meats, and sweet baked goods. These products are generally marketed aggressively through digital media because they have an appealing visual appearance, are relatively affordable, and are easily accessible through food delivery apps[33,34].

The aggressive marketing of UPF through digital platforms is not merely a matter of consumer preference, but rather part of a strategy by multinational food companies that rely on large-scale production, marketing, and distribution systems to maximize sales volume, product shelf life, and profits. The concentration of market power in the hands of a handful of transnational corporations that dominate food processing, branding, marketing, and retail further contributes to the high exposure of young people to UPF products, particularly through digital marketing strategies that target visual preferences, convenience, and the fast-paced lifestyle associated with Generation Z[35].

High frequency of UPF consumption leads to increased intake of added sugars, saturated fats, trans fats, sodium, and total energy, while intake of fiber, vitamins, minerals, and bioactive compounds tends to be lower. These conditions are the root cause of various health problems, such as metabolic changes, an increase in degenerative diseases, disruptions in the gut-brain axis due to changes in the composition of the gut microbiota, and elevated levels of systemic inflammatory markers that are biologically linked to the risk of depression[36].

7. Health Consequences

The rise in consumption of ultra-processed foods has a direct impact on the dietary quality and health status of Generation Z. Excessive consumption of UPFs leads to increased energy intake, resulting in an energy surplus that ultimately contributes to weight gain and an increased risk of obesity[37]. On the other hand, the low fiber and micronutrient content in UPF leads to a decline in overall dietary quality[36].

In the long term, continued consumption of UPF contributes to the development of metabolic syndrome, insulin resistance, type 2 diabetes, hypertension, cardiovascular disease, and various other metabolic disorders[38,39]. In addition to physical illnesses, there is a link between high consumption of UPFs and an increased risk of depression, anxiety, mood disorders, and impaired cognitive function due to their high content of sugar, fat, and certain food additives. Thus, the effects of UPF consumption are not limited to nutritional status but also impact the quality of life and mental health of Generation Z[40].

CONCLUSION

The digital food environment has been shown to play a significant role in shaping Generation Z's consumption behavior. Intensive exposure to social media, digital marketing, food delivery apps, influencers, algorithm-based promotions, and the ease of digital payments increases food exposure, food cravings, impulsive purchases, and a preference for convenient foods. These various factors interact with one another, driving an increase in the consumption of ultra-processed foods (UPFs) among Generation Z. A synthesis of 16 articles shows that the foods most frequently promoted in digital food environments are dominated by UPFs such as fast food, sugar-sweetened beverages, packaged snacks, and ready-to-eat meals.

These consumption patterns have the potential to lower dietary quality and increase the risk of obesity, metabolic disorders, cardiovascular disease, and mental health issues. Therefore, efforts are needed to improve digital nutrition literacy, strengthen regulations on digital food

marketing, and develop public health interventions that can create a healthier digital food environment and support nutritious food choices among Generation Z.

A limitation of this study is that it used only two databases as sources for literature searches, it would be better to use more databases so that the search results would be more varied and could be compared more accurately.

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