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Original Article

A Cross-Sectional Study of Social Media-Usage and Lifestyle Behaviors Among Adolescents in Makkah, Saudi Arabia

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Abstract

Background: The rise of social media as an integral part of adolescents' daily life has raised concerns about its health effects. Excessive social-media use has been linked to a number of lifestyle behaviors, namely increased fast-food consumption, reduced physical activity levels, and disrupted sleep patterns. While research in this area of study has been conducted, there is limited research on the association between social-media usage duration and these lifestyle behaviors among adolescents in Saudi Arabia specifically. Therefore, this study aims to explore the association between social-media usage duration and adolescents' fast-food consumption, physical activity, and sleep patterns in the city of Makkah, Saudi Arabia.

Methods: This cross-sectional study targeted adolescents aged 12–18 years from over 20 private and public intermediate and high schools in Makkah from January to March 2025. It examined the association between social-media usage and lifestyle factors, including fast-food consumption, physical activity, and sleep patterns. Data was collected using a structured, self-administered questionnaire that assessed demographic characteristics, duration of social-media use, and related lifestyle behaviors.

Results: Data from 278 adolescents were analyzed. Using chi square (χ^2) test, the study identified significant relationships between social-media usage duration, fast-food consumption, physical activity, and sleep patterns. Increased social-media use was significantly associated with lower frequency of exercise ($p = 0.023$), difficulty sleeping ($p = 0.015$), and young people feeling less energetic in the morning ($p < 0.001$).

Conclusions: The findings of this study establish a clear link between the effects of social-media usage duration on adolescent health behaviors in Makkah, Saudi Arabia, which are factors that collectively raise the risk for obesity and other health issues, highlighting the need for interventions to promote positive digital habits and diminish potential harms.

Keywords: *fast-food consumption, physical activity, sleep patterns, social-media-usage, adolescents*

Introduction

The rise and popularity of digital technology, particularly smartphones and tablets, has led to a significant increase in social media usage amongst adolescents. This has, however, also led to an increased concern over its health effects (1). Several studies have shown that excessive social-media usage is linked to several health issues, such as increased consumption of fast food, reduced levels of physical activity, and disrupted sleep patterns (1, 2).

Much of the influence over its increase in fast-food consumption comes from various socio-cultural and environmental factors (3). Adolescents often opt for fast food due to its convenience, affordability, and taste, all of which are reinforced by its widespread availability and targeted marketing campaigns by such outlets (4, 5). Yet, there is a pressing concern over the health risks that fast food poses to adolescents. Fast food tends to be high in calories, with excessive amounts of fat, salt, and sugar, and lacking in nutritional value. Thus, regular consumption of this type of food is problematic. A study found that consuming fast food more than twice a week was associated with poor diet patterns and led to a higher prevalence of moderate abdominal obesity (6).

In relation to regular physical activity, while it offers numerous benefits like improved cardiovascular health, mental well-being, and prevention of obesity and chronic diseases (7), concerns have arisen over reduced levels of engagement in recent years (8). For adolescents, because this is a critical time period for them to develop lifelong habits, incorporating physical activity into their daily routine would be highly advised. However, certain factors hinder young people from doing so; that is, a sedentary lifestyle – combined with electronic devices and screen-based activity - often takes precedence. Researchers have therefore looked into how this can be tackled. For instance, a 12-week multi-component intervention showed promising effects on increasing physical activity level while reducing screen time (9).

In terms of sleep, healthy sleep patterns for adolescents are vital for their overall well-being, yet there are various factors that often disrupt this, both in quality and quantity. Studies have consistently identified academic pressures and increased social media usage as major contributors to disrupted sleep patterns among adolescents (10). Excessive engagement with social networking platforms—particularly during evening and nighttime hours—has been associated with delayed bedtimes, shorter sleep duration, and poorer sleep quality, largely due to screen exposure, psychological arousal, and fear of missing out (FOMO) (10, 12). Insufficient sleep has been linked to a wide range of adverse outcomes, including cognitive impairments, mood disturbances, reduced academic performance, and compromised immune function (10, 11). Moreover, sleep deprivation has been shown to indirectly influence dietary behaviors, increasing cravings for energy-dense, fast foods and sugary snacks, while reducing motivation for physical activity (11). Fuligni and Hardway (12) further demonstrated that daily fluctuations in adolescents' sleep duration were closely related to changes in emotional well-being and activity patterns, with shorter sleep associated with increased sedentary behaviors such as screen time. Collectively, these findings suggest that excessive social media use contributes to a behavioral clustering effect, characterized by reduced physical activity, increased fast-food consumption, and chronic sleep insufficiency, all of which elevate the risk of obesity and poor health outcomes during adolescence.

There is limited research on the association between social-media usage duration and fast-food consumption, physical activity, and sleep patterns among adolescents in Saudi Arabia. That raises the importance of understanding the dynamics of social-media use duration and its impact on healthier dietary choices, promoting an active lifestyle, and ensuring better sleep patterns is vital for developing interventions to promote positive digital habits and diminish potential harms among adolescents in Saudi Arabia. Therefore, this study aims to explore the association between social-media usage duration and adolescents' fast-food

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consumption, physical activity, and sleep patterns in the Makkah region of Saudi Arabia.

Methods

Study design and setting

This study adopted a cross-sectional design and targeted adolescents aged 12–18 years enrolled in more than 20 public and private intermediate and high schools in Makkah, Saudi Arabia. Data collection was conducted over a three-month period from January to March 2025.

Inclusion and exclusion criteria

Adolescents aged 12–18 years who were enrolled in the selected schools and had electronic parental or legal guardian consent were eligible to participate. Students without confirmed parental consent, those outside the specified age range, or those who did not complete the questionnaire were excluded from the study.

Sample size calculation and sampling method

The sample size was calculated to ensure adequate statistical power for estimating lifestyle behaviors among adolescents. Schools were selected using a convenience sampling approach, and all eligible students within participating schools were invited to take part in the study. Participation was voluntary.

Data Collection

Data was collected using a structured, self-administered electronic questionnaire. The questionnaire link was distributed through school administrations to parents or legal guardians one day prior to the research team's school visit. Parents or legal guardians who agreed to their child's participation provided electronic informed consent via an online platform (WhatsApp). Only students with confirmed consent were included. The first page of the questionnaire clearly stated that participation was voluntary, no identifying personal information would be collected, and responses would remain confidential and used solely for academic research. Progressing to the next page was considered an indication of assent from the adolescent and consent from the parent or legal guardian. The questionnaire consisted of six sections: demographic data (10 items), family history (8 items), social-media usage duration (3 items on purpose, duration, and applications), dietary habits (3 items on fast-food consumption), physical activity level (2 items on type and frequency of exercise), and sleep patterns (3 items). The questionnaire was reviewed and validated by field experts, and the study received ethical approval from Umm Al-Qura University (Approval No. HAPO-02-K-012-2024-10-2225) and authorization from the Ministry of Education to contact schools.

Data analysis

Data analysis was performed using SPSS version 20.0. All variables were categorical and described using frequencies and percentages. Associations between social-media usage duration and fast-food consumption, physical activity level, and sleep patterns were examined using the chi-square (χ^2) test. To facilitate interpretation, key variables such as social-media usage, fast-food intake, and physical activity were recoded into binary categories based on relevant thresholds (e.g., ≥3 hours/day vs. <3 hours/day for screen time; ≥3 times/week vs. <3 times/week for fast food or exercise).

Additionally, a composite lifestyle risk score was constructed (ranging from 0 to 3), with one point assigned for each of the following behaviors: frequent fast-food consumption (≥3 times/week), low physical activity (<3 times/week), and frequent sleep difficulty (reported as "mostly" or "always"). This score was used to explore clustering of unhealthy behaviors among different screen-time categories. A significance level of $p < 0.05$ was used for all statistical tests.

The cut-off points for dichotomizing social media usage, fast-food consumption, and physical activity frequency in adolescent health research are commonly based on international recommendations, such as those from the World Health Organization (WHO) and the American Academy of Paediatrics (AAP), as well as regionally relevant studies. For example, the threshold of ≤2 hours per day for media use is consistent with AAP and WHO guidelines and is

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used in studies of Saudi adolescents to define excessive media use, with a high proportion of adolescents exceeding this recommendation (13, 14). Similarly, physical inactivity and frequent fast-food consumption are operationalized using cut-offs that reflect both international standards and local epidemiological data, as seen in studies from Saudi Arabia and the Gulf region (14, 15).

These thresholds are not arbitrary; they are associated with increased risks of adverse health outcomes. Exceeding recommended media use is linked to lower diet quality and suboptimal micronutrient intake, while high fast-food and sugary drink consumption, as well as low physical activity, are associated with higher rates of overweight, obesity, and unhealthy dietary patterns (13, 15). Insufficient physical activity and perturbed sleep patterns are also correlated with increased obesity prevalence and unhealthy behaviors in this population (14). Thus, the use of these cut-off points is evidence-based and reflects both international guidelines and region-specific research, with clear associations to increased risks of obesity, poor sleep, reduced physical activity, and unhealthy dietary patterns in adolescents (13, 14).

Results

Descriptive Analysis of the Participants

A total of 278 responses were collected; out of them, the majority were female (90%), with a mean age of 15 years. Most were Saudi nationals (65%) and enrolled in private schools (74%). Regarding household composition, 63% lived with 4–6 family members. Around 77% of mothers and 83% of fathers had education levels above high school. Employment status also showed that 68% of the participants' mothers were not working, whereas 70% of the fathers were employed. Approximately 44% of families owned their homes, while 52% rented. Additionally, 41% of participants had a parent with a chronic disease. Allergy prevalence was recorded at 15%, while 11% were uncertain/had no known allergies **(Table 1)**.

Table 1: Descriptive analysis results of the participant demographics (n=278)

Variable	Category	N	%
Gender	Female	249	90
Nationality	Saudi	182	65
School Type	Private	206	74
Disease History	No	206	74
Allergy	No	205	74
Parent Chronic Disease	No	154	55
Household Size	1–3 people	10	3
	4–6 people	174	63
	More than 6	94	34
Mother's Education	Above high school	213	77
	Less than high school	52	19
	Illiterate	6	2
	Don't know	6	2
Father's Education	Above high school	232	83
	Less than high school	30	11
	Illiterate	6	2
	Don't know	10	4
Mother's Job	Not working	187	68
	Working	73	26
	Retired/Other	16	6
Father's Job	Working	194	70
	Not working	15	5
	Retired/Other	68	25
Home Type	Rented	145	52
	Owned	122	44
	Unknown	11	4

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Social-media usage

A significant proportion of adolescents (80%) use social media for more than 3 hours daily, with 15% exceeding 8 hours. The primary purposes were communication and entertainment (70%), followed by education (20%) and gaming (10%). Instagram, TikTok, and Snapchat were the most frequently used platforms.

Fast-food consumption and social-media usage

Adolescents who reported using social media for more than 3 hours daily were more likely to consume fast food at least three times per week (35%) compared to those with lower usage (22%). Although the association between social media usage duration and fast-food frequency was not statistically significant ($p = 0.071$), the trend suggests a positive relationship. Notably, over 60% of respondents reported that fast food was typically ordered by parents or older siblings.

Physical activity and social-media usage

Nearly half of the participants (48%) reported low levels of physical activity (less than 3 times per week). Among adolescents with social-media usage above 5 hours per day, 60% reported exercising less than 3 times per week, compared to 34% among those with usage below 3 hours. This association was statistically significant ($p = 0.023$), indicating a clear inverse relationship between screen time and physical activity.

Sleep patterns and social-media usage

Most respondents (57%) reported sleeping 5–8 hours per night. However, 36% experienced difficulty falling asleep "sometimes," 14% "mostly," and 9% "always." Adolescents using social media for more than 5 hours daily were twice as likely to report frequent sleep difficulties ($p = 0.015$), and significantly less likely to feel energetic in the morning ($p < 0.001$). However, there was no significant difference in total sleep duration by social-media usage category ($p = 0.292$), suggesting sleep quality, not quantity, may be more affected.

Composite lifestyle risk score

Over 52% of participants who used social media>5 hours/day scored 2 or more, compared to only 27% in the <3-hour group. This demonstrates a clear trend toward clustering of unhealthy behaviors among high social-media users **(Table 2)**.

Table 2: Summary of key associations

Variable	High SM Use (>5h/day)	Low SM Use (<3h/day)	p-value
Fast-food ≥3x/week	97 (35%)	61 (22%)	0.071
Exercise <3x/week	267 (60%)	95 (34%)	0.023
Sleep difficulty (often/always)	97 (35%)	93 (14%)	0.015
Feeling energetic in morning	56 (20%)	114 (41%)	<0.001
Lifestyle Risk Score ≥2	145 (52%)	75 (27%)	

Discussion

The findings of this study underscore the substantial influence of social-media usage duration on various aspects of adolescent lifestyle behaviors, particularly fast-food consumption, physical activity level, and sleep patterns.

An estimated daily use of social media was prevalent amongst all the participants. Moreover, prolonged screen time was positively associated with preferences for fast food, which is consistent with previous research (16). In a related study, Alanazi et al. (2022) conducted a cross-sectional questionnaire-based study in Saudi Arabia to examine the impact of social media use on fast-food consumption and unhealthy habits among children and adolescents. Most participants reported regular social media use, with a substantial proportion spending more than four hours daily online, and fast food and sugary drinks were commonly consumed.

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Notably, 31% of adolescents reported that online fast-food advertisements influenced their eating habits, and higher social media engagement was significantly associated with unhealthy dietary choices and behaviors. The research highlighted social media exposure as a potential risk factor for poor dietary habits among Saudi youth, underscoring the need for targeted health education and regulation of food advertising on digital platforms (17). However, the current study did not find a statistically significant association between the frequency of fast-food consumption and exposure to online fast-food advertisements ($p = 0.071$), even though the trend suggests a positive relationship between fast food and social-media use, reinforcing the role of digital marketing in shaping food choices. Similarly, research from Kuwait found that adolescents who frequently used social media were more likely to order fast food. Aljazzaf (2017) conducted an empirical cross-sectional survey of Kuwaiti teenagers aged approximately 13–19 years across middle school, high school, and college levels to examine how social media application use affected various aspects of their lives, including reported behaviors and habits. Participants completed a questionnaire assessing social media use intensity, purposes of use, and perceived impacts such as sleep, family interaction, and eating habits. The analysis showed that while many teens spent several hours daily on social media and used it for communication, entertainment, and even product purchases, a notable portion indicated that social media influenced their eating behaviors, including food-related decisions such as ordering fast food. These findings suggest a relationship between frequent social media engagement and unhealthy eating patterns among Kuwaiti adolescents, consistent with broader concerns about digital media's influence on youth lifestyle choices. (18). These findings suggest that widespread digital marketing, especially via interactive social platforms, has the ability to influence adolescents in consuming this type of food. That is, marketers are proficient in using these platforms to blur the lines between entertainment and advertising for younger people (16), making it difficult for them to distinguish and critically evaluate between marketing and non-marketing content.

Regarding physical activity level, fewer than half of the participants met the recommended guidelines, with 48% reporting exercise less than three times per week. This aligns with findings from neighboring countries like Qatar, where a large proportion of adolescents were found to engage in low levels of physical activity and extensive sedentary behavior, including high screen time exceeding recommendations, which was linked to inactivity and unhealthy lifestyle patterns among youth (19).

Nationally, a study of male adolescents in Riyadh reported that those who were overweight or obese were significantly less physically active — expending fewer metabolic equivalent (MET) minutes per week in vigorous and total physical activity — and also exhibited high sedentary behaviors compared with their non-obese peers (20). These sedentary trends, coupled with high fast-food consumption and prolonged screen exposure (including social media use), indicate an elevated obesity risk among adolescents in the region.

Sleep patterns among participants revealed additional concerns. While most of the respondents reported sleep for 5–8 hours per night, a considerable proportion of participants reported sleep difficulties, with 36% sometimes, 14% mostly, and 9% always having trouble with sleep. These results are consistent with findings from a study that reported that 34.7% of secondary school students were poor sleepers. In that study, both TikTok usage and the number of hours spent on daily social media were independent predictors of poor sleep quality (21). Evidently, Brautsch et al. (2023) (22) have shown that screen-emitted blue light and the stimulating nature of social media can interfere with circadian rhythms, contributing to sleep disturbances.

In this study, the primary purposes for social-media use were communication and entertainment, followed by educational purposes, and lastly, gaming. This distribution aligns with findings from a study by Alshwiah and Alaulamie (2023) (23),

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which revealed that Saudi university students predominantly used social media for escapism, social interaction, and information seeking. These purposes correspond to the Uses and Gratifications Theory (UGT), suggesting that adolescents utilize social media to fulfil various psychological and social needs (23, 24).

As previously mentioned, the current study identified Instagram, TikTok, and Snapchat as the top platforms among adolescents. This is in line with a previous study by Al-Garni et al. (2024) (25), who found that TikTok (80%), Snapchat (77.9%), and Instagram (63.8%) were the most frequently used apps among secondary school students. Their popularity may be attributed to the visual and interactive features found within these apps, which would appeal to this age demographic.

Implications

The findings from this study have a number of vital implications for the Saudi context, including public health, education, and family-based interventions. The observed associations between prolonged social-media usage duration and unhealthy lifestyle behaviors identified in this study (i.e., increased fast-food consumption, reduced physical activity level, and disturbed sleeping patterns) emphasize the need for comprehensive health promotion strategies focused on adolescents. To help achieve this, there should be a collective effort amongst schools, families, and healthcare providers to increase awareness around balancing digital habits.

In addition, educating adolescents on how social media outlets use advertisements to influence dietary behaviors may help them to critically evaluate and identify this type of content. Lastly, on a policy-level, preventative measures could be put in place by incorporating screen time guidelines and healthy lifestyle education into the school curriculum, which in turn could help minimize social-media-usage.

Strengths of the study

This study contributes to the existing research on adolescent health by examining an unexplored area within the Saudi context. It examines the relationship between social-media usage and various lifestyle factors among adolescents (a population increasingly engaged in digital platforms). Additionally, the use of a comprehensive and validated questionnaire, which is able to capture key behavioral components, such as fast-food consumption, physical activity level, and sleep patterns, has been vital for this study. Moreover, the inclusion of students from both public and private schools in Makkah adds diversity to the sample and enhances the generalizability of the findings within the region.

Limitations of the study

Despite its contributions, the study has several limitations. One such limitation is relying solely upon self-reported data, as this can potentially lead to recall and social desirability bias. This in turn can affect the accuracy of the responses that relate to the key components of the study (i.e. screen time, dietary habits, and physical activity level, and sleeping pattern). Another limitation was the gender imbalance in the study sample, with a significantly female majority. Additionally, selection bias may have occurred due to a higher recruitment rate from private schools compared to governmental schools, potentially limiting the representativeness of the overall adolescent population in Makkah. Lastly, the lack of objective measurement tools (i.e. recorded weight, height and BMI) also highlights a limitation in the study's methodology.

Recommendations for future research

To build upon the findings from this study, longitudinal or experimental designs could be used to help determine any clearer causal links between social-media usage and adolescent health outcomes. To improve the representativeness of the findings, future research should widen the study sample by including adolescents from various regions across Saudi Arabia, as well as ensuring a balance between both genders is captured. In addition to this, the accuracy of the data could be significantly improved by incorporating measuring tools for the participants, such as fitness trackers and screen-time monitoring apps, which would provide objective data and remove bias. Lastly, it may be useful for

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future studies to explore the qualitative aspects of social media engagement by examining the type of social media content being consumed; this may help inform whether certain content plays a role in influencing physical and mental health outcomes in adolescents.

Conclusion

This study revealed significant links between excessive social-media usage duration and unhealthy lifestyle patterns of adolescents in Makkah, Saudi Arabia. The study identified two main key associations with prolonged screen time use: a reduction in physical activity and disrupted sleep patterns. These results highlight a concerning and pressing need for public health strategies that address and tackle the digital habits of young people. As per the recommendations outlined in this study, educational programs, parental involvement, and policy-level interventions are all key components that could be implemented to promote healthier lifestyles and reduce the potential health risks associated with excessive social-media usage duration. Through this multi-pronged and collaborative effort, stakeholders can help empower adolescents to navigate the digital world more effectively, whilst maintaining their overall well-being.

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Disclosure

Statement

This study was not a clinical trial; therefore, a clinical trial registration number was not applicable.

Funding

The study did not require external funding and was conducted without financial support.

Ethical consideration

The study received ethical approval from Umm Al-Qura University (Approval No. HAPO-02-K-012-2024-10-2225) and authorization from the Ministry of Education to contact schools.

Data availability

The data used in this study are not publicly available within the paper. To obtain access to the dataset, please contact the corresponding author via the email address provided in the manuscript.

Author contribution

SH & AB wrote the abstract, introduction, methodology, results, and analysed the data.

MA, SA, EA & RF collected the data.

SH, AE, MA, AB & EA Designed the questionnaire and wrote the discussion.

AE & NA wrote the discussion and conclusion.

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