



OPEN Eating distractions as predictors of ultra-processed food consumption and Mediterranean diet adherence in adolescents

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Previous studies have examined the relationships between some eating distractions and diet quality in the young population. However, to our knowledge, no study has analyzed the associations between multiple eating distractions (e.g., using a mobile phone, watching television [TV], eating while standing) and diet quality, particularly in terms of ultra-processed food (UPF) consumption and adherence to the Mediterranean diet (MedDiet) among adolescents. The objective of the current study was to analyze the relationships of eating distractions with UPF consumption and adherence to the MedDiet in a sample of Spanish adolescents. This cross-sectional study used data from 826 adolescents aged 12–17 years from the Eating Healthy and Daily Life Activities study in Spain. The following eating distractions were assessed via a self-report questionnaire: “(1) eating while talking on the phone/ sending short message service [SMS]/emails or using social networks”, (2) watching TV while dinner, and (3) eating while standing”. The Mediterranean Diet Quality Index for children and adolescents (KIDMED) was utilized to evaluate adherence to the MedDiet. A self-administered food frequency questionnaire, previously validated for the Spanish population, was used to assess UPF consumption. The associations of eating distractions with UPF consumption and MedDiet adherence were analyzed via generalized linear models. The models were adjusted for sex, age, socioeconomic status, body mass index, physical activity, sedentary behavior, and sleep duration. A significant association was found, with a higher eating distraction score corresponding to greater UPF consumption (unstandardized beta coefficient [B] = 71.25; 95% confidence interval [CI] 34.69–107.82; $p < 0.001$). Furthermore, a higher eating distraction score was associated with a lower KIDMED score ($B = -0.29$; 95% CI -0.39 to -0.18 ; $p < 0.001$). Individually, for grams of UPFs consumed, a significant association was observed for eating while using a phone or social network, which was linked to higher UPF consumption ($B = 120.70$; 95% CI 57.83–183.57; $p < 0.001$). However, the associations for eating while watching TV ($B = 49.60$; 95% CI -9.01 to 108.21; $p = 0.098$) and eating while standing ($B = 63.66$; 95% CI -37.92 to 165.25; $p = 0.220$) did not reach statistical significance. For KIDMED score, all the eating distractions were associated with a significant decrease, with the largest effect observed for phone or social network use ($B = -0.44$; 95% CI -0.62 to -0.26). Watching TV ($B = -0.18$; 95% CI -0.35 to -0.01 ; $p = 0.037$) and eating while standing ($B = -0.42$; 95% CI -0.71 to -0.13 ; $p = 0.004$) also showed significant negative associations. Although diet quality is influenced by multiple factors, eating distractions may negatively impact adolescents by increasing UPF consumption and reducing adherence to the MedDiet. These findings underscore the importance of understanding the role of the eating environment in shaping healthy dietary habits.

Keywords Distracted eating, Eating healthy, NOVA, Youths, Mindful eating

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Diet quality is a multifaceted concept that reflects the overall nutritional adequacy of a person's diet. It encompasses both the consumption of nutrient-rich foods and the limitation of unhealthy components such as ultra-processed foods (UPFs). Poor diet quality has been associated with various adverse health outcomes^{1,2}, particularly in young populations, where dietary habits are still being established³. UPFs have been defined as a type of food that is made up of industrial formulations primarily consisting of food-derived substances, additives, and other artificial ingredients⁴. These foods are designed to be convenient, long-lasting, and very tasty, but they often contain high levels of salt, sugar, and fat while providing little nutritional value, such as snacks, sweetened beverages, frozen meals, or fast food⁵. The concept that UPFs are unhealthy components of people's diets is gaining widespread recognition in the field of nutrition research and official reports^{1,2,6,7}. There is increasing awareness of how UPFs can negatively impact the quality of a person's diet and increase the likelihood of health issues^{8,9}. Globally, between 1990 and 2010, the intake of unhealthy food items increased, with heterogeneity across regions and countries¹⁰. UPFs are prevalent in diets worldwide, contributing to 20% to more than 60% of total energy intake, depending on the country and age range². Despite these findings, UPFs have received limited attention in efforts to improve overall health⁵. To address this gap, it is crucial to provide evidence that links UPF consumption to health outcomes.

One dietary pattern that advocates low consumption of UPFs is the Mediterranean diet (MedDiet). The MedDiet, a predominantly plant-focused dietary regimen that is gaining popularity worldwide, is considered one of the most beneficial dietary patterns for health¹¹. This dietary pattern has positive effects not only in adults but also in children and adolescents, promoting healthier eating habits and supporting growth and development during these critical life stages^{12–14}. Studies indicate that people can experience numerous advantages by integrating components of this diet into their dietary practices¹⁵. This dietary approach involves substantial consumption of plant-derived foods (such as vegetables, fruits, grains, legumes, seeds, nuts, and potatoes), utilization of fresh, minimally processed, locally sourced foods in accordance with seasons, primary reliance on olive oil for fats, and moderate consumption of dairy items (primarily yogurt and cheese), among other constituents¹¹. Furthermore, the MedDiet has been suggested as a benchmark dietary model owing to its myriad of health and nutritional advantages, its ability to promote biodiversity, its sociocultural significance as a culinary tradition, its minimal environmental footprint, and its favorable economic contributions to local societies¹⁶.

Research has explored how distractions during meals could affect food consumption, focusing on factors such as television (TV) viewing, the food environment, and social interactions¹⁷. In general, cognitive distractions during meals tend to increase food intake both immediately and during subsequent meals^{17–19}. However, under certain conditions, distractions may reduce immediate intake, such as when the distraction involves high-cognitive-load tasks (e.g., completing a rapid visual information processing task during meals)²⁰. A systematic review and meta-analysis by Robinson et al.¹⁸ highlights that attentive eating could significantly influence food intake and that incorporating mindful eating principles into interventions could represent a novel approach to weight loss and maintenance without the need for conscious calorie counting. However, a systematic review by Sina et al.²¹ noted that social media exposure is associated with unhealthy eating patterns in children and adolescents, which is mediated by physiological and social mechanisms. Notably, this review included studies analyzing the use of social media in general rather than specifically during meals.

Previous studies have examined the relationships between some eating distractions and diet quality in the young population^{22–24}. For example, the absence of distractions at breakfast has been related to increased adherence to the MedDiet among Spanish children and adolescents²². Furthermore, another study among Spanish preschoolers suggested that watching TV during meals is associated with greater UPF consumption and a greater probability of exceeding 10% of total energy intake in free sugar intake²³. Among adolescents, one study from Brazil reported significantly higher UPF consumption among those who ate in front of screens almost every day or every day²⁴. However, to our knowledge, no study has analyzed the associations between multiple eating distractions (e.g., using a mobile phone, watching TV, eating while standing) and diet quality, particularly in terms of UPF consumption and adherence to the MedDiet among adolescents. Owing to the limited research on this particular relationship, gaining a more profound understanding of how eating distractions are related to diet quality could hold significant importance in the formulation of future intervention initiatives aimed at enhancing dietary behaviors among adolescents. Therefore, the objective of the current study was to analyze the relationships of eating distractions with UPF consumption and adherence to the MedDiet in a sample of Spanish adolescents.

Materials and methods

Study design and population

This research utilizes data from the Eating Healthy and Daily Life Activities (EHDLA) study in a secondary cross-sectional analysis. The comprehensive methodology of the EHDLA study has been previously described²⁵. The participants were Spanish adolescents between 12 and 17 years old who were attending three secondary schools in the *Valle de Ricote*, Region of Murcia (Spain). Data collection occurred during the 2021–2022 academic year. Among the initial 1378 adolescents (100.0%) in the EHDLA study, 442 (32.1%) were excluded because of insufficient diet quality information (UPF consumption and MedDiet adherence). Further exclusions were made for incomplete data on eating distractions ($n = 29$; 2.1%), body mass index ($n = 41$; 3.0%), and physical activity/sedentary behaviors ($n = 40$; 2.9%). The final sample comprised 826 adolescents (44.7% boys). Participation required written parental or guardian consent for the selected adolescents. They received an

informative document outlining the study's objectives and planned assessments and surveys. The adolescents were also asked to provide their own consent to participate.

Ethics

Ethical approval for this research was obtained from multiple institutions. The University of Murcia's Bioethics Committee granted approval (ID: 2218/2018), as did the Ethics Committee of the Albacete University Hospital Complex and the Albacete Integrated Care Management (ID: 2021-85). Additionally, the study was conducted in compliance with the guidelines set forth in the Helsinki Declaration.

Procedures

Eating distractions

The study evaluated various eating distractions. The participants were questioned about three behaviors: (1) eating while talking on the phone/sending short message service (SMS)/emails or using social networks, (2) watching TV while eating dinner, and (3) eating while standing. For each of these measures, participants could select from four options: (a) not important, (b) a little important, (c) somewhat important, or (d) very important. These choices were assigned values of zero, one, two, or three points. The eating distractions score was calculated by adding the points from all three items, resulting in a range from zero to nine points.

Ultra-processed food consumption

A self-administered food frequency questionnaire (FFQ), previously validated for the Spanish population²⁶, was used to assess food consumption and energy and nutrient intake. The FFQ comprises 45 items categorized into 12 food groups: (a) red and processed meat; (b) poultry, fish, and eggs; (c) fruits (including preserved fruit); (d) vegetables (salads and other vegetables); (e) dairy products; (f) salted cereals (breakfast cereals, bread, pasta, and rice); (g) sweet cereals (biscuits, pastries); (h) legumes; (i) nuts; (j) sweets (sugars and chocolates); (k) sweetened beverages; and (l) alcoholic drinks. Adolescents reported their weekly or monthly consumption of these foods, from which the average weekly portion for each group was calculated.

UPFs were classified according to the NOVA system⁴, which divides foods into four categories on the basis of the extent and purpose of industrial processing. These categories are (1) unprocessed or minimally processed foods, (2) processed culinary ingredients, (3) processed foods, and (4) UPF and drink products.

Adherence to the Mediterranean diet

The Mediterranean Diet Quality Index for children and adolescents (KIDMED)²⁷ was utilized to evaluate adherence to the MedDiet. This assessment tool consists of a 16-item questionnaire, with scores ranging from −4 to 12. Questions addressing unhealthy dietary habits receive negative scores, whereas those related to healthy practices are assigned positive scores. The total score is then classified into three categories: high (≥ 8 points), moderate (4–7 points), and low (≤ 3 points) MedDiet adherence. For subsequent analyses, these categories were consolidated into two groups: optimal adherence (≥ 8 points) and nonoptimal adherence (< 8 points) to the MedDiet. This categorization was chosen to simplify interpretation, align with previous studies in adolescent populations, and emphasize clinically relevant differences in dietary adherence patterns.

Covariates

The participants self-reported their sex and age. Socioeconomic status was assessed via the Family Affluence Scale (FAS-III), which involves responses to six questions about household possessions and amenities (e.g., bedrooms, cars, bathrooms, computers, vacations, or dishwashers)²⁸. The FAS-III score ranged from 0 to 13, with higher scores indicating higher socioeconomic status. Body mass index (BMI) was calculated by dividing the participants' weight in kilograms by their height in meters squared. Overall sleep duration was determined by asking teens about their usual bedtime and wake-up time on weekdays and weekends. The average sleep duration was calculated via the formula $[(\text{weekday sleep duration} \times 5) + (\text{weekend sleep duration} \times 2)]$ divided by 7. The Youth Activity Profile Physical (YAP) questionnaire was used to assess physical activity and sedentary behavior among the adolescents²⁹. This self-report questionnaire covered a 7-day period and included 15 items categorized into out-of-school activities, school-related activities, and sedentary habits.

The relationships between eating distractions and UPF consumption or adherence to the MedDiet in adolescents may be influenced by multiple factors. The covariates analyzed in this study—including age, sex, socioeconomic status, sleep duration, sedentary behavior, physical activity, and BMI—are well-established contributors to diet quality, as reported in previous research^{30–33}.

Statistical analysis

To evaluate the normal distribution of variables, researchers have employed density and quantile–quantile plots, along with the Shapiro–Wilk test. Counts (n) and percentages (%) were used to represent categorical variables, whereas medians and interquartile ranges (IQRs) were used for continuous variables (due to the nonnormal distribution of continuous variables). As no significant interaction was found between eating distractions and sex regarding UPF consumption, the KIDMED score, or optimal adherence to the MedDiet ($p > 0.05$ for all), analyses were conducted on girls and boys together. Generalized linear models (GLMs) with robust methods were utilized to investigate the relationships between individual eating distractions (such as eating while using phones/social media, watching TV while dinner, or eating while standing) or eating distraction scores and UPF consumption and MedDiet adherence among adolescents. These models address heteroscedasticity and outliers³⁵. For continuous outcomes, GLMs with a Gaussian distribution (using the “SMDM” method) were applied to estimate each unstandardized beta coefficient (B) with its 95% confidence interval (CI). For dichotomic outcomes, GLMs with a binomial distribution (applying the “Mqle” method) were employed to provide odds ratios (ORs).

with 95% CIs. The rationale for this approach was to better capture the relationship between eating distractions and both continuous and binary outcomes. The study also calculated estimated marginal means (M) of UPF consumption (in grams) and the KIDMED score, as well as predictive probabilities (%) of optimal MedDiet adherence, with 95% CIs. All models were adjusted for covariates, including sex, age, socioeconomic status, body mass index, physical activity, sedentary behavior, and sleep duration. Statistical analyses were performed via R statistical software (version 4.4.0) by the R Core Team in Vienna, Austria, and RStudio (2024.04.1 + 748) from Posit in Boston, MA, USA. Statistical significance was set at $p < 0.05$.

Results

Table 1 summarizes the characteristics of the study participants (N = 826). The median age was 14 years (IQR 13 to 15), with 45% boys and 55% girls. The median BMI was 21.7 kg/m² (IQR 19.3 to 25.3), and the median FAS-III score was 8.0 (IQR 7.0 to 10.0), indicating a mid-to-high socioeconomic status in the sample. The median physical activity score was 2.6 (IQR 2.2 to 3.0), whereas sedentary behavior had a similar median score of 2.6 (IQR 2.2 to 3.0). The median sleep duration was 8.3 h per night (IQR 7.6 to 8.8). The median score for eating distractions was 3.0 (IQR 2.0 to 4.0), with the highest median score reported for watching TV during meals (2.0; IQR 1.0 to 3.0). The median UPF consumption was 1642.5 g per week (IQR 1050.0, 2620.0), and 37.4% of the adolescents demonstrated optimal adherence to the MedDiet (KIDMED score ≥ 8), with a median KIDMED score of 7.0 (IQR 5.0 to 8.0).

Figure 1 displays the adjusted marginal means of grams of UPFs consumed or KIDMED score in relation to the eating distraction score. After adjusting for covariates, a significant association was found, with higher distraction scores corresponding to greater UPF consumption ($B = 71.25$; 95% CI 34.69 to 107.82; $p < 0.001$). Furthermore, a higher distraction score was associated with a lower KIDMED score ($B = -0.29$; 95% CI -0.39 to -0.18 ; $p < 0.001$). Figure S1 displays the adjusted marginal means of servings of UPFs consumed or predictive probabilities of having an optimal adherence to the MedDiet in relation to the eating distraction score. The full results of the main analyses are detailed in Table S1 and Table S2, with additional analyses for UPF servings and optimal MedDiet adherence in Table S3 and Table S4, respectively.

Figure 2 presents the adjusted marginal means of grams of UPFs consumed or KIDMED score for three specific distractions: eating while using a phone or social network, eating while watching TV during lunch or dinner, and eating while standing. For grams of UPFs consumed, a significant association was observed for eating while using a phone or social network, which was linked to higher UPF consumption ($B = 120.70$; 95% CI 57.83 to 183.57; $p < 0.001$). However, the associations for eating while watching TV ($B = 49.60$; 95% CI -9.01 to 108.21; $p = 0.098$) and eating while standing ($B = 63.66$; 95% CI -37.92 to 165.25; $p = 0.220$) did not reach statistical significance. For KIDMED score, all the eating distractions were associated with a significant decrease, with the largest effect observed for phone or social network use ($B = -0.44$; 95% CI -0.62 to -0.26). Watching TV ($B = -0.18$; 95% CI -0.35 to -0.01 ; $p = 0.037$) and eating while standing ($B = -0.42$; 95% CI -0.71 to -0.13 ; $p = 0.004$) also showed significant negative associations. Figure S2 indicates the adjusted marginal means of servings of UPFs consumed or predictive probabilities of having an optimal adherence to the MedDiet

Variable	N = 826 ¹
Age (years)	14.0 (13.0, 15.0)
Sex	
Boys	369 (45%)
Girls	457 (55%)
FAS-III (score)	8.0 (7.0, 10.0)
BMI (kg/m ²)	21.7 (19.3, 25.3)
YAP-S physical activity (score)	2.6 (2.2, 3.0)
YAP-S sedentary behaviors (score)	2.6 (2.2, 3.0)
Overall sleep duration (hours)	8.3 (7.6, 8.8)
Energy intake (kcal)	2577.5 (1955.6, 3442.9)
Eating while using a phone or social network (score)	0.0 (0.0, 1.0)
Eating while watching TV during lunch or dinner (score)	2.0 (1.0, 3.0)
Eating while standing (score)	0.0 (0.0, 0.0)
Eating distractions (score)	3.0 (2.0, 4.0)
KIDMED (score)	7.0 (5.0, 8.0)
Adherence to the MedDiet	
Nonoptimal	517 (62.6%)
Optimal	309 (37.4%)
UPF (g)	1642.5 (1050.0, 2620.0)
UPF (servings)	26.0 (17.0, 38.0)

Table 1. Descriptive data of the study participants. BMI, body mass index; CI, confidence Interval; FAS-III, Family Affluence Scale-III; KIDMED, Mediterranean Diet Quality Index for children and adolescents; TV, television; UPF, ultra-processed food; YAP-S, Spanish Youth Active Profile. ¹Median (IQR) or Frequency (%).

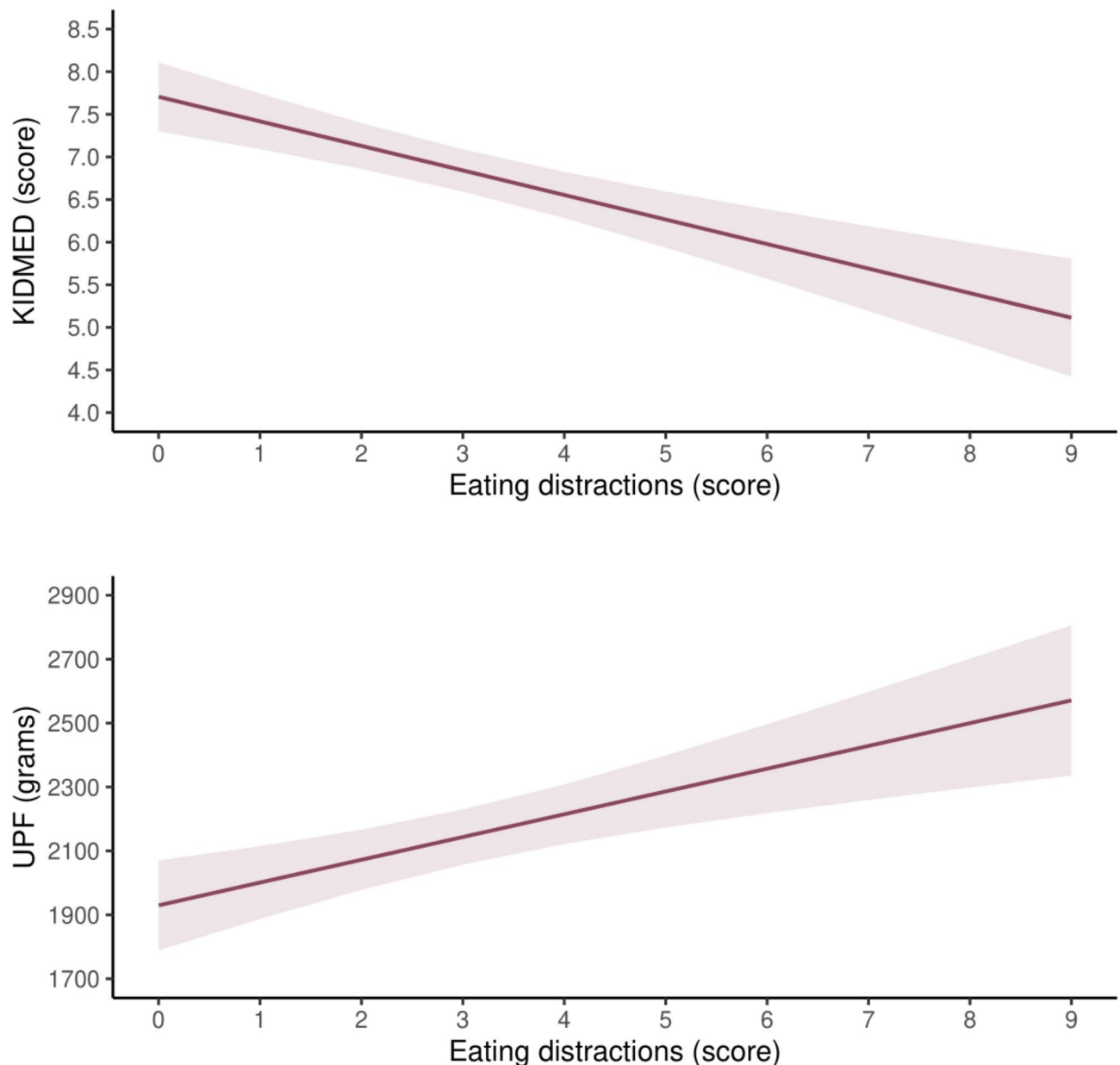


Fig. 1. Estimated marginal means of grams of ultra-processed foods or Mediterranean Diet Quality Index for children and adolescents score in relation to eating distractions score among Spanish adolescents. Age, sex, body mass index, physical activity, sedentary behavior, sleep duration, and energy intake were adjusted for. UPF, ultra-processed food.

in relation to the three specific eating distractions. The full results are available in Tables S5–S16 (including also results for UPF servings and optimal MedDiet adherence).

Discussion

Our findings suggest that increased distractions during meals were associated with reduced UPF consumption, lower KIDMED scores, and a decreased likelihood of optimal MedDiet adherence among the studied adolescents. Specifically, using a phone or social media platform during meals was significantly associated with higher UPF consumption, whereas watching TV during meals and eating while standing were linked to lower adherence to the MedDiet. These findings align with existing research indicating that mindful eating could impact food consumption¹⁸. Moreover, our observations are consistent with those of previous studies focused on young populations^{22–24}. The consistency of our results with those of previous studies reinforces the potential role of mealtime distractions as determinants of dietary patterns in adolescents. Earlier studies have linked the absence of distractions, particularly during breakfast, with higher adherence to the MedDiet²², whereas watching TV during meals has been associated with higher UPF consumption^{23,24}. Our findings add to this body of evidence

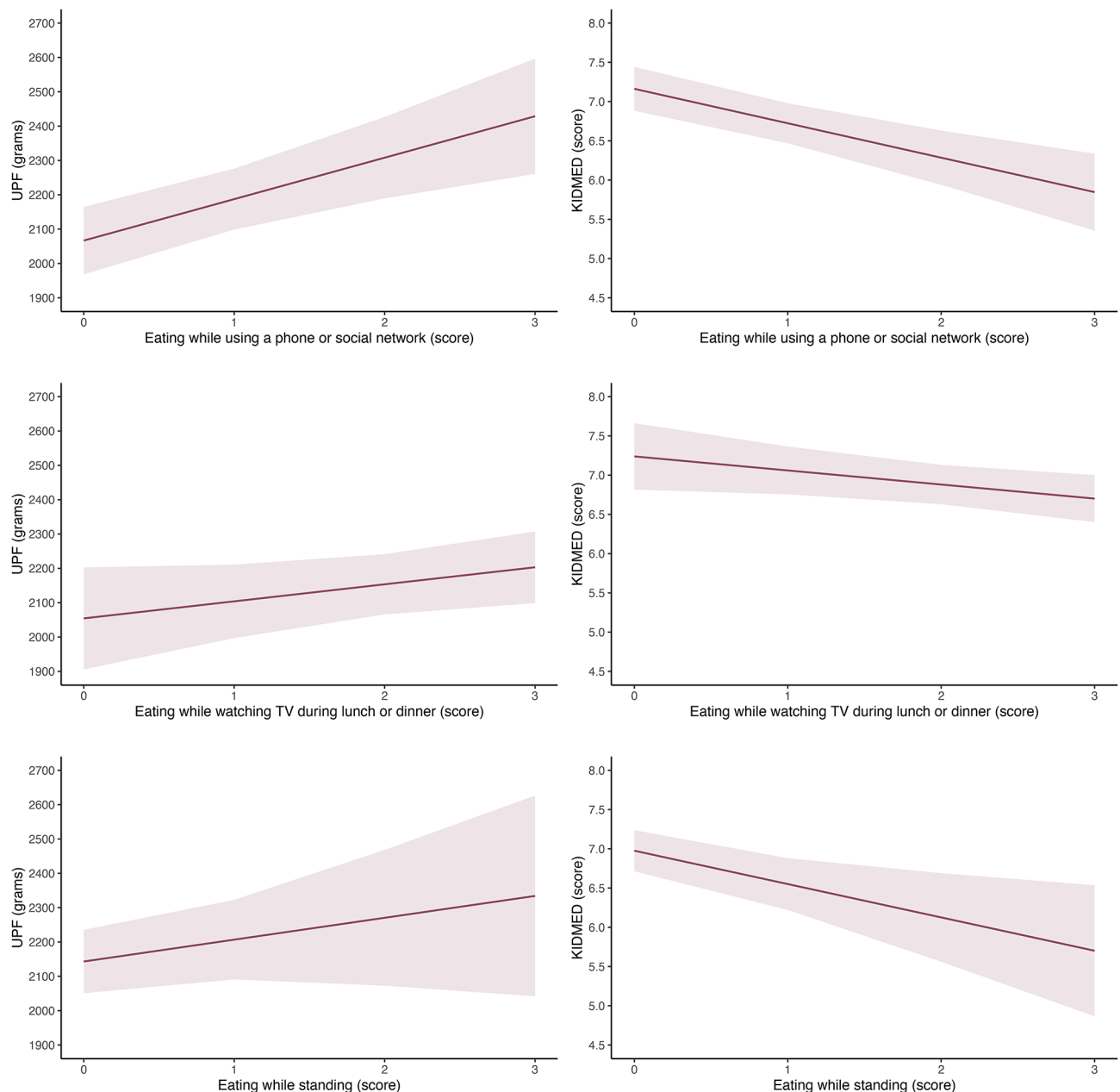


Fig. 2. Estimated marginal means of grams of ultra-processed foods consumed or Mediterranean Diet Quality Index for children and adolescents score in relation to eating while talking on the phone/sending SMS/emails or using social networks, eating while watching TV while eating dinner, or eating while standing among Spanish adolescents. Age, sex, body mass index, physical activity, sedentary behavior, sleep duration, and energy intake were adjusted for. KIDMED, Mediterranean Diet Quality Index for children and adolescents; UPF, ultra-processed food.

by highlighting the relevance of distractions beyond screen time, such as standing while eating, which may reflect less structured eating habits and potentially influence overall diet quality. The associations observed in this study should be interpreted considering the potential influence of various individual and lifestyle factors. Previous research has highlighted the impact of demographic, behavioral, and anthropometric characteristics on diet quality during childhood and adolescence^{30–33}. These results align with the literature, reinforcing the importance of addressing these factors when evaluating the relationships among eating distractions, UPF consumption, and adherence to the MedDiet.

One of the possible reasons could be related to the theory of “mindful eating”. This theory, which involves applying mindfulness to eating-related thoughts, emotions, bodily sensations, and behaviors³⁴, has been shown to enhance diet quality and overall well-being through healthier food choices³⁵. However, distractions during meals, such as watching TV or using electronic devices, reduce attention to food and awareness of consumption^{18,36}. These distractions can lead to impulsive choices, ignoring hunger and fullness cues³⁷, and prioritizing quick,

convenient foods over fresh and nutritious options³⁸—key elements of the MedDiet. Encouraging mindful eating could therefore be pivotal in fostering healthier dietary behaviors and preserving the benefits of the MedDiet.

Additionally, eating distractions could lead individuals to choose less healthy foods. Distractions, such as using a phone, watching TV, or playing video games, are often associated with consuming UPFs²³ and those high in fats, sugars, and salt⁴. These foods are less common in the MedDiet, which emphasizes fresh, natural products such as fruits, vegetables, legumes, fish, and olive oil³⁹. In this sense, previous studies have pointed out the relationship between eating distractions (e.g., watching TV) and UPF consumption^{23,40}. In addition, the lack of attention given to meals may lead to a preference for foods that require no preparation or planning⁴¹, resulting in a departure from the principles of the MedDiet. Furthermore, cognitive distractions during meals decrease food intake and memory of the meal among healthy young adults, highlighting their potential impact on eating behavior and food consumption regulation. However, caution is needed to interpret this potential reason because that study was conducted in healthy young adults and not in adolescents.

On the other hand, greater eating distractions among adolescents (especially when they use a mobile phone or watch TV) could lead to increased exposure to unhealthy food advertising. For example, previous studies have reported that watching TV⁴² or being on social media⁴³ during meals exposes adolescents to ads for fast food and UPFs, which can influence their preferences and steer them away from traditional Mediterranean foods⁴⁴. Adolescents are more exposed than children are to food products classified as unhealthy and to various marketing techniques, especially those targeting minors⁴⁵. Despite existing self-regulation policies, young people continue to experience high levels of exposure to advertisements for unhealthy foods⁴⁶. In this sense, previous evidence suggests that food companies may increasingly focus their advertising strategies on adolescents, highlighting the need to review and strengthen current regulations to better protect this vulnerable population.

This research has several limitations that warrant acknowledgment. The study's cross-sectional nature prevents the establishment of causal relationships. Additional research is necessary to determine whether reducing eating distractions leads to higher diet quality. Moreover, the direction of the association remains unclear, as superior diet quality could explain fewer eating distractions. Longitudinal studies are needed to ascertain whether increased eating distractions directly contribute to decreased diet quality in adolescents. The use of self-reported data introduces potential recall and social desirability biases, which may affect the accuracy of reported eating distractions and diet quality. Although the analysis accounts for various covariates, diet quality is influenced by multiple factors, and unaddressed variables could impact the observed results. The findings may not be applicable to other Spanish regions or countries because of cultural differences in eating habits, such as dining with family or others, which could influence eating distractions and subsequent results. Despite these limitations, this study contributes valuable cross-sectional evidence regarding the role of eating-related factors in dietary behaviors among adolescents, an understudied population. The strengths of this study include the use of a large sample of Spanish adolescents, the application of validated tools for assessing dietary intake and adherence to the MedDiet, and the consideration of multiple eating distractions simultaneously. Additionally, the adjustment for numerous covariates, including sociodemographic, lifestyle, and anthropometric variables, enhances the robustness of the results. This study also addresses an important gap in the literature by analyzing the association between eating distractions and diet quality, providing a foundation for future longitudinal research and public health interventions.

Conclusions

Although diet quality is influenced by multiple factors, eating distractions may negatively impact adolescents by increasing UPF consumption and reducing adherence to the MedDiet. These findings underscore the importance of understanding the role of the eating environment in shaping healthy dietary habits. Future studies could explore interventions aimed at fostering mindful eating practices in this age group. Public health initiatives aimed at improving dietary quality among young people could benefit from encouraging the removal of electronic devices (such as mobile phones, computers, and TV) during meals and discouraging eating while standing.

Data availability

Data generated or analyzed during this study are available from the corresponding author upon reasonable request, since they pertain to minors, and privacy and confidentiality must be respected.

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Author contributions

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S, and CH-B designed the study. JFL-G contributed to the interpretation and analysis of the data. JFL-G wrote the initial draft. JFL-G, FQ, JAM-E, EC-V, CM, MEC-M, RAU-L, LAS-C, MPZ-D, MJM-C, DAP-Z, MAB-C, HG-E, JO-A, RY-S, and CAH-B contributed to the revision of the manuscript. All authors approved the final version of the manuscript.

Declarations

Competing interests

The authors declare no competing interests.

Consent statement

Informed consent was obtained from all the participants.

Ethical approval

This study was conducted in accordance with the Declaration of Helsinki. This study was approved by the Bioethics Committee of the University of Murcia (approval ID 2218/2018, approved on 18 February 2019) and the Ethics Committee of the Albacete University Hospital Complex (approval ID 2021–85, approved on 23 November 2021).

Additional information

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