RESEARCH PAPER

Socio-Demographic and Regional Predictors of Dietary Compliance versus Snacking Habits among Jordanian School children

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ABSTRACT
Background: The prevalence of childhood obesity has emerged as a critical global health challenge, with rates nearly tripling in recent decades. In Jordan, the pandemic significantly disrupted daily routines, creating an "obesogenic" environment that reduced physical activity and fostered detrimental dietary shifts among the youth.
Objective: This study aimed to identify the demographic and socioeconomic predictors of dietary and lifestyle behaviors among Jordanian schoolchildren using a validated assessment tool. Methodology: A cross-sectional study was conducted using the validated Dietary and Lifestyle Behavior Inventory (DLBI). A sample of 900 schoolchildren aged 6 to 18 years was selected through purposive sampling across rural and urban areas in Jordan. The instrument demonstrated exceptional content validity and strong internal reliability for assessing nutrition and activity levels. Results: The sample included 37.8% males and 62.2% females, primarily from middle-income families (80.2% earning 501–1000 JOD) with highly educated parents (>68% holding bachelor's degrees). Two-way ANOVA and multiple regression analyses revealed that broader dietary behavior was significantly predicted by a gender-by-region interaction ($p = .002$), a strong main effect for living region ($p < .001$), and father's occupation ($p = .016$). Rural residents particularly females—demonstrated significantly higher dietary scores. In stark contrast, snacking meal behavior remained largely uniform and was not significantly predicted by the overall demographic or geographic models ($p = .080$), with father's educational level emerging as the sole, weak negative predictor ($p = .015$). Conclusion: This research confirms that geographic location and paternal socioeconomic factors are critical predictors of broad dietary compliance, whereas snacking habits cut across demographic boundaries as a universal lifestyle challenge. These insights provide a vital, comprehensive foundation for targeted health interventions..
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I. INTRODUCTION

During the lockdown period, government-mandated stay-at-home orders drastically curtailed children's mobility, leading to a marked decline in physical activity and a profound shift in both lifestyle pacing and dietary habits. Several psychological and social factors drove these pandemic-era dietary alterations [1] Most prominent was the psychological gratification offered by food. Plunged into a period defined by chronic stress and worry, children often struggled to comprehend the sudden confinement, experiencing heightened anxiety[2] . To counteract these negative emotions, many turned to emotional eating, consuming whatever comforting food quantities and qualities were accessible at home. Concurrently, the lockdown fostered a unique form of domestic sociability; family breakfasts and dinners, which were frequently rushed or skipped prior to the pandemic, suddenly emerged as a primary daily routine[3-4]

Conversely, pervasive boredom and disorientation further destabilized children's habits. Stripped of structured daily activities and regular timetables, youth found themselves in an environment largely devoid of established rules. This total disruption of normalcy, characterized by the absence

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of morning school routines and regular sports practices, perpetuated a cycle where food transformed into both a coping mechanism and a central daily anchor. This pandemic-induced "obesogenic" environment has severely exacerbated an already troubling trajectory of childhood obesity in Jordan. Historical data reveals a steady decline in nutritional status over the past two decades. In 2013, approximately 71% of Jordanian schoolchildren aged 6 to 12 fell within a normal Body Mass Index (BMI) range, while overweight prevalence stood at 17% for boys and a stark 33% for girls. By 2016, combined rates of overweight and obesity had consolidated heavily, reaching 17.3% and 15.7%, respectively [5] (Zayed et al., 2016). Early investigations into local risk factors identified excessive television viewing, higher daily pocket money, and a family history of weight issues as primary predictors of excess weight among younger children. Subsequent pre-pandemic research further implicated highly sedentary lifestyles, general physical inactivity, and the frequent consumption of processed snacks from school cafeterias as key catalysts for weight gain [6] (Khader et al., 2009). Recent literature underscores that these unhealthy trends are continuing to escalate across Jordan, presenting an urgent public health crisis [7]

Recent assessments using World Health Organization (WHO) and Centers for Disease Control (CDC) growth standards indicate that overweight and obesity remain particularly prevalent among females, with an annual increase now observed across all pediatric age groups. In northern Jordan specifically, recent data found that 12% of school students were overweight and 13% were obese, with obesity rates spiking to 20% among those who routinely consumed snacks three or more times a day [8]. This surge is heavily reinforced by modern lifestyle shifts, including prolonged electronic device utilization, the habit of eating while looking at screens, and shortened sleep durations. Taken together, the combined impact of historical baseline risks, pandemic-induced routine disruptions, and modern digital sedentariness underscores a critical need for targeted public health interventions to mitigate the growing epidemic of childhood and adolescent obesity in Jordan[9-10].

II. METHODOLOGY

A. Research Design and Data Collection To ensure a robust quantitative assessment of the demographic, socioeconomic, and lifestyle characteristics of Jordanian schoolchildren during the COVID-19 pandemic, this study employed a cross-sectional research design. Data collection was carried out using the validated Dietary and Lifestyle Behavior Inventory (DLBI), an instrument specifically adapted from existing validated questionnaires to guarantee both cultural appropriateness and scientific rigor for the target population [11]. The survey instrument captured a wide array of explanatory variables to isolate significant predictors of dietary choices. Specifically, the questionnaire quantified primary demographic and socioeconomic attributes including gender, family income, and parental educational attainment alongside comprehensive lifestyle metrics such as screen time, modes of school transportation, and parental smoking behaviors. These data points established a comprehensive baseline for advanced statistical modeling, including two-way analysis of variance (ANOVA) and multiple linear regression tests, to determine how specific factors such as age, living region, and parental backgrounds influenced dietary patterns under the unique environmental constraints of the pandemic.

B. Participants and Setting The study sample comprised a substantial cohort of 900 schoolchildren aged 6 to 18 years, recruited from various educational institutions across urban and rural sectors in Jordan using a purposive sampling strategy. In terms of geographical distribution, the participants were predominantly from metropolitan and urban areas (80.8%), with a smaller proportion (19.2%) residing in rural regions. This large-scale administration allowed for the exploration of complex interactions between health-related lifestyle habits and socioeconomic backgrounds, providing a comprehensive overview of the children's health statuses.

C. Instrumentation and Validation The development and validation of the DLBI followed a rigorous, multi-phased psychometric framework to ensure its scientific and contextual suitability. Content validity was established via a panel of 10 independent experts who evaluated 110 initial items spanning sociodemographic characteristics, dietary habits, food preferences, and physical activity patterns. The evaluation yielded an exceptionally high Scale Content Validity Index (S-CVI) of 0.997 and a Universal Agreement score (S-CVI/UA) of 0.951, confirming a robust expert consensus regarding item relevance. Following content validation, the instrument's internal reliability and structural integrity were evaluated through a pilot study involving 253 participants. Factor analysis and internal consistency checks were applied, with Cronbach’s alpha values demonstrating strong reliability across primary subscales (e.g., vegetable consumption domains consistently scored above 0.70), confirming the DLBI as a psychometrically sound tool for this population [11]

III.RESULTS

The study assessed a sample of 900 Jordanian schoolchildren aged 6 to 18 years. The demographic composition consisted of 340 male participants (37.8%) and 560 female participants (62.2%). Socioeconomic data revealed that the majority of families (80.2%) earned an income between 501 and 1000 JOD. Parental education was notably high, with 68.3% of fathers and 71.7% of mothers possessing a bachelor's degree. The sample primarily inhabited metropolitan or urban areas (80.8%), while 19.2% resided in rural regions. Regarding lifestyle, 77.8% of students practiced sports at school, but only 26.8% engaged in physical activity outside of the school environment. Additionally, 65.2% of children reported that at least one parent smoked. Descriptive analysis indicated that bakeries and pastries (M = 2.00) and rice or cereal-based products (M = 1.96) were among the most

frequently consumed food categories. Conversely, the consumption of fruits and vegetables (M = 1.45) was infrequent. Meal patterns showed a high prevalence of skipping breakfast, as "dinner only" (M = 2.15) and "lunch and dinner only" (M = 2.04) were the most reported habits. In terms of food preferences, apples (M = 2.38) and kiwi (M = 2.39) were the most favored fruits, while spinach (M = 1.27) was the least favored vegetable. Physical activity data highlighted a sedentary trend, with children averaging 2.99 hours of TV and 3.68 hours of electronic gaming daily. During the pandemic, walking (M = 2.09) and bicycling (M = 2.06) were practiced more often than running (M = 1.80).

Table 1: TWO-Way Anova Results for the Effects Of Gender And Living Region On Dietary Behavior

Variable	Category	Frequency	Percentage
Gender	Male	340	38.8
	Female	560	62.2
Family Income	1–500 JOD	73	8.1%
	501–1000 JOD	722	80.2%
	1001–1500 JOD	105	11.7%
Age of Parents	21–30 Years	622	69.1%
	31–40 Years	235	26.1%
	41–50 Years	43	4.8%
Father Education	Diploma	147	16.3%
	Bachelor	615	68.3%
	Master or PhD	138	15.3%
Mother's Occupation	Governmental employee	593	65.9%
	Private sector employee	136	15.1%
	Retired	88	9.8%
	Non-employed	83	9.2%
Living Region	Urban	727	80.8
	Rural	173	19.2

Table 2: Two-Way ANOVA Results for the Effects of Gender and Living Region on Dietary Behavior and snacking meal

Variable	**Gender**			**Living region**			**Gender x Living region**		
	F	df	P value	F	df	P value	F	df	P value
Dietary behaviour	.41	1	.52	83.32	1	<0.001	9.704	1	.002
Snacking meal	.166	1	.684	.108	1	.743	.455	1	.500

Based on table 2 A two-way ANOVA was conducted to examine the effects of gender and living region on dietary behavior among a sample of 900 participants. The results revealed a statistically significant interaction effect between gender and living region on dietary behavior,F(1, 896) = 9.70, p = .002, indicating that the impact of one's living region depends on their gender. Specifically, while rural residents descriptive means were higher than urban residents across both groups, the gap was more pronounced among females (Rural: M = 2.13, SD = 0.6; Urban: M = 1.63, SD = 0.37) than males (Rural: M = 1.98, SD = 0.50, Urban: M = 1.73, SD = 0.58). Regarding the main effects, there was a statistically significant main effect for living region, F(1, 896) = 83.32, p < .001 with rural participants demonstrating overall higher dietary behavior scores (M = 2.06, SD = 0.58) compared to urban participants (M = 1.67, SD = 0.46). However, the main effect for gender was not statistically significant, F(1, 896) = 0.41, p = .522. Collectively, the corrected model accounted for approximately 10.7% of the variance in dietary behavior (R^2 = .107, Adjusted R^2 = .104).

According to table 2 A two-way ANOVA was conducted to examine the effects of gender and living region on snacking meal behavior among a sample of 900 participants. The results revealed that the interaction effect between gender and living region was not statistically significant, F(1, 896) = 0.46, p = .500 indicating that the influence of living region on snacking meals does not depend on gender. Furthermore, there were no statistically significant main effects for either independent variable. The main effect of gender yielded F(1, 896) = 0.17, p = .684, with males (M = 1.76, SD = 0.50) and females (M = 1.72, SD = 0.44) demonstrating similar snacking behavior scores. Similarly, the main effect of living region was not significant, F(1, 896) = 0.11, p = .743, with comparable scores found between urban (M = 1.73, SD = 0.46) and rural (M = 1.75, SD = 0.45) residents. Overall, the corrected model accounted for virtually none of the variance in snacking meal behavior (R^2 = .002, Adjusted R^2 = -.001), suggesting that neither gender nor living region are meaningful predictors of snacking habits in this sample

Table 3: Regression Coefficients For Socio-Demographic Predictors Of Dietary Behavior And Snacking Meal

	B	SE	β	t	P value
Dietary behaviour					
Father's educational level	-.044	.030	-.049	-1.465	.143
Mother's Educational Level	.006	.027	.007	.211	.833
Father's occupation	-.061	.025	-.081	-2.415	.016*
Mother's occupation	-.001	.017	-.003	-.087	.931
Living Region	.370	.042	.289	8.889	<0.001**
Gender	-.043	.034	-.041	-1.254	.210
Snacking meal					
Age	.021	.032	.023	.679	.497
Father's educational level	-.069	.029	-.085	-2.433	.015*
Mother's Educational Level	.010	.026	.014	.391	.696
Father's occupation	.040	.024	.058	1.655	.098
Mother's occupation	-.029	.016	-.063	-1.790	.074

β:standardized beta

*p<0.05

**p<0.01

According to table 3,A multiple linear regression analysis was conducted to evaluate how various demographic and socioeconomic factors predict dietary behavior. The overall regression model was statistically significant, $F(6, 893) = 17.66$, $p < .001$, indicating that the combination of predictors significantly explains variance in dietary behavior. Among the individual predictors, Living Region (beta = .289, t = 8.89, $p < .001$) and Father's occupation (beta = -.081, t = -2.42, p = .016) were significant predictors of dietary behavior. Specifically, living in a rural region (or a higher-coded region category) was associated with higher dietary behavior scores, while changes in the father's occupational category trended toward lower scores. Conversely, gender, mother's occupation, and both parents' educational levels did not significantly predict dietary behavior ($p > .05$). All tolerance values were well above 0.10 and VIF values were below 10 (ranging from 1.052 to 1.136), confirming that multi-collinearity was not a concern in this analysis.

According to table 3,A multiple linear regression analysis was conducted to evaluate how age, parental education levels, parental occupations, and living region predict snacking meal behavior. The overall regression model was not statistically significant, $F(6, 893) = 1.89$, $p = .080$, indicating that the combination of these socio-demographic predictors does not significantly explain variance in snacking habits. Looking at individual variables, Father's educational level was the only statistically significant predictor within the model (B = -.085, t = -2.43, p = .015), indicating that a higher paternal education level is associated with lower snacking meal scores. All other predictors including age, mother's education, parental occupations, and living region failed to reach statistical significance ($p > .05$). Furthermore, multicollinearity was not an issue in this analysis, as all tolerance values were well above 0.10 and Variance Inflation Factors (VIF) remained safely below 10 (ranging from 1.048 to 1.127).

IV. DISCUSSIONS

The results of this study underscore the significant influence of demographic and environmental factors on the dietary behaviors of Jordanian schoolchildren during the COVID-19 pandemic. A primary concern identified was the high frequency of breakfast skipping, with many children adopting eating patterns limited to lunch and dinner only. This shift in meal frequency coincided with an increased consumption of energy-dense foods such as bakeries and pastries, which ranked among the most consumed food categories. These findings reflect the "obesogenic" environment fostered by the pandemic, where the lack of structured school schedules led to detrimental shifts in eating habits. The low mean value for fruit and vegetable consumption further suggests that nutritional quality was compromised during the confinement period, mirroring global trends of increased processed food intake during health crises [12]

Furthermore, the living region was identified as a strong predictor, highlighting a geographical divide in nutritional health. Children in urban areas likely benefit from different levels of food security and access to diverse food resources compared to those in rural regions, though urban settings also present higher exposure to processed "comfort" foods. The significant impact of paternal occupation as a negative predictor further suggests that specific socioeconomic pressures or parental employment structures can create barriers to a healthy home food environment. These findings indicate that the pandemic's impact was not uniform; rather, it was filtered through the lens of family stability and geographic location, necessitating interventions that are tailored to specific socioeconomic and regional contexts [13]

The study also highlighted a profound sedentary trend, with children devoting an average of nearly seven hours daily to television and electronic gaming. This excessive screen time likely displaced opportunities for vigorous physical activity, which was reported at low frequencies during the pandemic. While walking and bicycling remained the most prevalent forms of exercise, overall participation in structured physical activity outside of school was limited. The successful validation of the DLBI in this study provides a robust, culturally appropriate tool for monitoring these complex behaviors. By identifying these specific behavioral predictors, public health officials can better develop strategies to mitigate the long-term impacts of the pandemic on childhood obesity and metabolic health[14]

The findings reveal a distinct contrast in how socio-demographic factors shape overall dietary behavior versus specific snacking habits. While broader dietary behavior was strongly influenced by structural and familial factors, evidenced by rural residents scoring significantly higher than urban residents (particularly among females) and father's occupation playing a meaningful role snacking meal behavior remained largely uniform across most demographics. The overall regression and ANOVA models for snacking habits failed to reach statistical significance, indicating that choices regarding snacking are more universal or perhaps driven by unmeasured individual variables (such as personal taste preferences, stress, or schedule constraints) rather than geographic or gender boundaries. The lone exception was father's educational level, which emerged as a weak but significant negative predictor of snacking frequency. Ultimately, these outcomes suggest that while high-level nutritional and dietary patterns are heavily anchored in socio-economic and regional environments, localized habits like snacking cut across demographic lines within this sample.

V. CONCLUSIONS

This research confirms that demographic and socioeconomic factors play a distinct role in shaping the lifestyle profiles of Jordanian schoolchildren, revealing a sharp contrast between overall dietary habits and specific snacking routines. Geographic location and paternal factors emerge as critical predictors of broader dietary behavior, with rural residents particularly females demonstrating higher dietary scores, aligning with the pattern that certain regions maintain better dietary compliance. Conversely, snacking meal behavior remains largely uniform across most demographics, suggesting that snacking habits cut across socioeconomic boundaries and represent a more universal lifestyle challenge. This uniformity in snacking may be closely linked to the concerning pandemic-era trends of frequent breakfast skipping, high carbohydrate intake, and excessive sedentary screen time that affect the student population at large. Ultimately, by successfully utilizing a validated and reliable Dietary and Lifestyle Behavior Inventory (DLBI), these findings provide a vital, comprehensive foundation for targeted health interventions and future longitudinal research aimed at addressing the childhood obesity crisis in Jordan.

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