

Assessment of skipping breakfast at home among adolescent school students in Badia Region, Jordan

Amani Masalha¹, Mohammad S ALBashtawy², Mohammad N Alshloul³, Nisren Abu Baker⁴, Shereen Hamadneh², Abdullah Alkhawaldeh², Mohammed S Alyahya⁵, Ma'en Aljezawi², Asem Abdalrahim², Mohammad Suliman² & Doha M Alshloul⁵

¹Mafraq Health Directorate, Ministry of Health, Jordan; ²Department of Community and Mental Health, Princess Salma, Faculty of Nursing, Al al-Bayt University, Jordan; ³Irbid National University, Faculty of Nursing, Irbid-Jordan; ⁴Department of Community and Mental Health, Faculty of Nursing, Jordan University of Science & Technology, Irbid, Jordan; ⁵Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan

ABSTRACT

Introduction: Healthy meals play an essential role in the healthy physical and mental development of adolescents. Breakfast at home is associated with improved nutritional choices, and skipping breakfast is detrimental. This study assessed prevalence of skipping breakfast at home among adolescent students in the Badia Region of Jordan, identifying the reasons and characteristics associated with such behavioural choice. **Methods:** A cross-sectional survey among adolescent students (aged 13-16 years, in 8th-9th grades) from six public schools in Badia Region, Mafraq Governorate, Jordan, was conducted through self-administered questionnaire from February to March 2022. **Results:** Results showed that 68.1% of 552 student participants regularly skipped breakfast at home (72.4% boys vs. 61.3% girls; $p=0.007$). Among those who regularly skipped breakfast, three main rationales for this choice were not feeling hungry (5.3%), lack of time (2.7%), and lack of appetite (3.5%). **Conclusion:** The prevalence of skipping breakfast at home among adolescents in Badia Region was high for various reasons, including lack of time, not feeling hungry, seeking to manage weight, and insufficient knowledge on the importance of healthy breakfast. Therefore, understanding the reasons and factors that contribute towards breakfast skipping may help in solving the problem, underscoring that positive beliefs should be reinforced in schools, with parents encouraging adolescents to eat healthy breakfast.

Keywords: adolescence, Badia region, breakfast consumption, Jordan, skipping breakfast

INTRODUCTION

Healthy food, including the behaviour related to eating, as well as nutritional content, is essential for the human body to perform its biological and physical operations with optimal efficiency. It is

essential for growth and development, and for meeting the requirements of daily life (Gómez-Pinilla, 2008). Healthy eating encompasses many nutritional, personal, and socio-cultural considerations pertaining to the type of

*Corresponding author: Dr Mohammad N Alshloul, RN, Ph.D.
Associate Professor, Irbid National University, Faculty of Nursing, Irbid-Jordan
Tel:+962-781874521; E-mail: alshloulm@gmail.com
ORCID: <https://orcid.org/0000-0001-9448-9369>
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food per se (e.g., its nutritional content and methods of preparation), amount, timing, and quality. The global norm is that people should typically eat three meals a day – breakfast, lunch, and dinner (Paoli *et al.*, 2019). Breakfast is considered particularly essential because it provides the body with the necessary energy to perform the physical and mental activities undertaken throughout the remainder of the day, until repose during the night when the body can repair and recover. Breakfast is also particularly instrumental in regulating appetite and reducing the risk of type 2 diabetes (Alhilabi & Payne, 2018).

Breakfast at home (B@H) typically provides the best nutritional, physiological and social contexts for morning eating, and it should not be skipped, particularly among adolescents, who in addition to basic physiological benefits can attain improved mental performance from an appropriate and healthy breakfast (O’Sullivan *et al.*, 2009). Studies have documented that skipping breakfast is a common nutritional problem among adolescents (Ali *et al.*, 2019). Most studies related to skipping breakfast showed an increase in its prevalence among children (aged under 18 years) and an association with increased rates of obesity and weight gain (up to 30.0%). Physiological impacts of breakfast-skipping can be profound, including increased risk of heart disease, as well as broader negative psychological associations (Bonnet *et al.*, 2020). Ardeshirlarijani *et al.* (2019) reviewed related literature and found that breakfast-skipping is particularly notable among adolescents, especially among girls, in which context is related to body image issues. Furthermore, they reported that five studies identified poor quality food intake and increased metabolic syndrome for those who skipped breakfast.

This study focused on assessing the prevalence of skipping B@H among adolescent school students in the Badia Region of Mafraq Governorate in Jordan, drawing attention to the nutritional health issues of these students and their behavioural choices. A healthy breakfast for school children in adolescence provides the essential nutrients needed for their activities and is associated with improving the general nutritional status of the individual (AlBashtawy, 2017). A large percentage of adolescents who live in Jordan have poor eating habits and continuing these habits may increase their risk of chronic diseases during adolescence and later in life. Students’ breakfast-skipping is associated with several health problems and can interfere with daily life through impaired psychosocial and cognitive functions, reduced academic achievement, and poorer school attendance (AlBashtawy, 2015; Moller *et al.*, 2021).

The results of this study have important implications on health promotion and disease prevention programmes for this target group. Discovery of the reasons for skipping B@H in an adolescent group can reveal new evidence or provide additional support to existing evidence, which can be used to promote healthy nutritional status of adolescent students and improve their breakfast intake (Abu-Mweis *et al.*, 2014). Those who have regular healthy, balanced breakfasts tend to get more fibre and dairy in their diets, which leads to less overeating and fewer unhealthy snacks throughout the day. Furthermore, those who eat breakfast at home are more likely to achieve such benefits, including in terms of improving cognitive performance, getting essential nutrients, keeping cravings under control, avoiding overweight and obesity, improving muscle gain and development, healthier skin, stabilising

blood glucose, and cardiac protection (Bonnet *et al.*, 2020). Accordingly, pressure is increasing on the Jordanian government and the Ministry of Health to pay attention to the nutritional health issues of students at this stage. In the Badia Region, few studies have focused on the consumption of B@H. Therefore, this study aimed to identify the prevalence and reasons for skipping B@H, and to examine its associations with socio-demographic characteristics of adolescent school students in the Badia Region, Jordan.

MATERIALS AND METHODS

Study design

A cross-sectional descriptive design was used. The study was conducted among adolescent students aged 13-16 years from six public schools in Jordan's Northeastern Badia Region (which constitutes 25,930 km² or 35.7% of the total area of the region).

Setting and sample

The schools in the Directorate of Education for Northeastern Badia are distributed through four sub-regions: Umm Al-Jamal, Subha, Umm Al-Qattin, and Deir Al-Kahf. A sub-region, Umm Al-Jamal, was randomly selected. This sub-region had 42 schools and 7,025 male and female students, according to the official statistics of the Governorate of Mafrq (2021). Eighth and ninth graders (aged 13-16 years) were selected as the sample, numbering 1,258 pupils (Governorate of Mafrq, 2021). Six public schools (three females and three males) in three different areas of Umm Al-Jamal were randomly selected, targeting 590 students overall.

To determine the minimum sample size, the following formula was used:

$$n = N * X / (X + N - 1)$$

where $X = Z_{\alpha/2} * p^*(1-p)/MOE^2$, $Z_{\alpha/2}$

is the critical value of the normal distribution at $\alpha/2$, MOE is the margin of error at 5%, p is the expected prevalence of breakfast consumption among students aged 13-16 years (0.5%), and N is the population size (Daniel, 1999).

According to the formula, the minimum size sample was 233. However, to overcome the problems of attrition and incomplete questionnaires, a larger sample of students ($n=590$) was taken as a precaution. The final sample size in the study (after dropout and loss to follow-up etc.) was 552. Thus, the number added to the minimum sample was 319.

Inclusion and exclusion criteria

All male and female adolescent students in the 8th-9th grades (aged 13-16 years) from the selected schools were included, while students in other grades and students or their families who preferred not to participate in the study were excluded.

Definitions

Conceptually, 'breakfast' is the first meal of the day that breaks the fast after the longest period of sleep, being consumed within three hours of waking, and comprising food or beverages from at least one food group (Deshmukh-Taskar *et al.*, 2010). In itself, it may be consumed at any location (O'Neil, 2014), but it is generally considered to be the 'most important meal of the day', both popularly and among physiologists (Frank, 2009). Skipping B@H intrinsically referred to not consuming a morning meal in the home, and a 'breakfast skipper' was operationally defined as 'a subject who did not eat breakfast at home on four or more days a week' (Frank, 2009).

Measurement and data collection

Data collection took place in the second semester of 2022, from the second to the fourth week of February. After receiving all approvals to conduct the study, we

visited the principals of the selected schools to explain the purpose, method, and procedures of data collection. After obtaining the principals' approval, the 8th-9th grade classes were recruited and the purpose of the study and its importance were explained to the students.

The study tool was developed based on a comprehensive review of the literature regarding breakfast consumption among school students of different age groups (AlBashtawy, 2015; AlBashtawy, 2017; Kubik *et al.*, 2009;). It was subjected to linguistic validation, to ensure that the questions were translated reliably. To achieve this, experts in both languages translated the questionnaire into Arabic, and another person back-translated the Arabic version into English; and the secondary English translation was found to be valid in comparison to the original. The final version of the questionnaire was checked for face validity by an expert panel of researchers at the study places. The Cronbach's alpha coefficient for the study instrument was found to be 0.734, indicating high internal consistency and reliability.

After developing the questionnaire and preparing it in its initial version, it was presented to research experts to check its content and to ensure the accuracy of the questionnaire. The questionnaire was then distributed to 19 school students of the same age as the target sample of the study, as a convenient sample, to determine the validity of the questionnaire from their perspective in terms of selected questions, the time required to fill out the questionnaire, and unclear questions or phrases.

The questionnaire consisted of four sections. The first section contained questions about socio-demographic data including school, gender, grade, age, mother's education, residential arrangements (i.e., parents

or grandparents living in the home), mother's employment, and household income. The second section contained questions that covered personal characteristics, including 'yes' or 'no' questions about days and places of eating breakfast, and three multiple-choice questions on the components of a meal, who prepares it, and with whom the participant ate it. The last section consisted of questions exploring the reasons for skipping breakfast, comprising nine 'yes' or 'no' questions, and one open-ended question, enabling participants to express any reasons not listed in the available options.

Data analysis

IBM SPSS Statistics for Windows version 26.0 (IBM Corporation, Armonk, New York, USA) was used to analyse the collected data. Shapiro-Wilk test was used, as it is the most powerful testing tool when testing for a normal distribution. Descriptive analysis, including mean and standard deviation values, were used to analyse continuous dependent and independent variables. Frequency distributions were used to analyse categorical variables and chi-square test was used to compare the differences between the variables of skipping B@H. To estimate the relationship between two dependent variables, binary logistic regression was used, with a statistical significance of $p < 0.05$.

Ethical considerations

Ethical approval to conduct this study was obtained from the Scientific Research and Ethics Committee of the College of Nursing, Al al-Bayt University (IRB #2/2022). Permission was also obtained from the Directorate of Education of Northeastern Badia to conduct the study in selected schools. Principals of the selected schools also gave their consent and facilitation. As the study included participants

aged under 18 years, written informed consent was obtained from the students and their parents/ guardians prior to conducting any data collection. The investigator ensured that the relevant protocols were followed, taking into account informed consent, autonomy, anonymity, and confidentiality issues. The confidentiality and anonymity of the information were guaranteed. Furthermore, the demographic questionnaire was coded with numbers to keep the data confidential and to anonymise all responses.

RESULTS

Socio-demographic characteristics

A total of 552 adolescent students from

six public schools in the Jordanian Badia Region participated in the study. The majority were males (61.6%), more than half were from the 9th grade (51.6%), in the age group of 15-16 years (52.0%) (with the remainder aged under 15 years), with a mean age of 14.5±0.53 years. Regarding living status, the vast majority of participants (99.5%) lived with their parents and did not have sufficient monthly income (75.7%). Moreover, most of their mothers did not work outside the home ($n=473$, 85.7%) and 348 (63.0%) were uneducated. The majority of the students reported skipping B@H on four or more days per week ($n=376$, 68.1%), while less than a third ($n=176$, 31.9%) consistently had

Table 1. Socio-demographic distribution of school students by gender (N=552)

Variables	Male		Female		Total	
	n	%	n	%	n	%
Class						
8 th grade	162	47.6	105	49.5	267	48.4
9 th grade	178	52.4	107	50.5	285	51.6
Age in years						
13-14	162	47.6	103	48.6	265	48.0
15-16	178	52.4	109	51.4	287	52.0
Residential status (living with...)						
Parents	340	100.0	209	98.6	549	99.5
Mother	0	0.0	1	0.5	1	0.2
Grandparents	0	0.0	2	0.9	2	0.4
Work of mother						
Full time	7	2.1	7	3.3	14	2.5
Part-time	43	12.6	22	10.4	65	11.8
Housewife	290	85.3	183	86.3	473	85.7
Income						
Not sufficient	273	80.2	145	68.4	418	75.7
Sufficient	59	17.4	62	29.2	121	21.9
Sufficient and saving	8	2.4	5	2.4	13	2.4
Education of mother						
Not educated	211	62.1	137	64.6	348	63.0
Secondary and lower	98	28.8	56	26.4	154	27.9
More than secondary	31	9.1	19	9.0	50	9.1
Skipping breakfast 4+ days per week						
No	94	27.6	82	38.7	176	31.9
Yes	246	72.4	130	61.3	376	68.1

B@H before school. Table 1 summarises the socio-demographic characteristics of the study sample.

Comparison of socio-demographic characteristics and skipping B@H

As shown in Table 2, gender was significantly associated with breakfast skipping; more boys skipped their breakfast than girls (72.4% vs. 61.3%, $p=0.007$), indicating increased risk of breakfast skipping among males. However, age, class, residential arrangements, household income, mother's work, and mother's education

were not significantly associated with breakfast skipping behaviour.

Associations between students' breakfast food type and gender

Participants were asked about their consumption of typical Jordanian breakfast foods. Table 3 shows that eating hummus and falafel were significantly associated with gender ($\chi^2(1)=5.995$, $p=0.014$), reflecting that female students were 1.70 times more likely to eat these than male students. Similarly, having tea at breakfast was significantly associated with gender

Table 2. Comparison of socio-demographic characteristics and skipping breakfast B@H

Socio-demographic characteristics	Breakfast skipping 4+ days per week n (%)		χ^2	p
	Yes	No		
Gender				
Male	246 (72.4)	94 (27.6)	7.318	0.007 ^a
Female	130 (61.3)	82 (38.7)		
Age in years				
13-14	174 (65.7)	91 (34.3)	1.415	0.234 ^a
15-16	202 (70.4)	85 (29.6)		
Class				
8 th grade	174 (65.2)	93 (34.8)	2.069	0.150 ^a
9 th grade	202 (70.9)	83 (29.1)		
Residential status (living with...)				
Parents	375 (68.3)	174 (31.7)	2.645	0.240 ^b
Mothers	0 (0.0)	1 (100.0)		
Father	0 (0.0)	0 (0.0)		
Grandparent	1 (50.0)	1 (50.0)		
Mother's work				
Full time	11 (78.6)	3 (21.4)	0.846	0.679 ^b
Part-time	46 (70.8)	19 (29.2)		
Housekeeper	319 (67.4)	154 (32.6)		
Household income				
Not sufficient	291 (69.6)	127 (30.4)	1.95	0.364 ^b
Sufficient	77 (63.6)	44 (36.4)		
Sufficient and saving	8 (61.5)	5 (38.5)		
Mother's education				
Not educated	232 (66.7)	116 (33.3)	1.572	0.461 ^b
Secondary and lower	111 (72.1)	43 (27.9)		
More than secondary	33 (66.0)	17 (34.0)		

^aPearson's chi-square test was conducted and considered statistically significant at $p<0.05$.

^bFisher's Exact Test was conducted and considered statistically significant at $p<0.05$.

Table 3. Associations between students' breakfast food type and gender

Food type	Gender, n (%)		χ^2 <i>p</i> -value	Odds ratio	95 % CI	
	Male	Female			Lower	Upper
Bread and cheese						
Yes	264 (77.6)	166 (78.3)	0.033	0.963	0.636	1.457
No	76 (22.4)	46 (21.7)	0.857 ^a			
Hummus and falafel						
Yes	250 (73.5)	175 (82.5)	5.995	0.587	0.383	0.902
No	90 (26.5)	37 (17.5)	0.014 ^a			
Oil and thyme						
Yes	263 (77.4)	147 (69.3)	4.388	1.51	1.026	2.224
No	77 (22.6)	65 (30.7)	0.036 ^a			
Tea						
Yes	235 (69.1)	163 (76.9)	3.918	0.673	0.454	0.997
No	105 (30.9)	49 (23.1)	0.048 ^a			
Chips and chocolate						
Yes	227 (66.8)	145 (68.4)	0.158	0.928	0.643	1.34
No	113 (33.2)	67 (31.6)	0.691 ^a			

^aPearson's chi-square test was conducted and considered statistically significant at $p < 0.05$.

($\chi^2(1)=3.918$, $p=0.048$), revealing that girls were more likely to drink the infusion than boys. Conversely, eating oil and thyme were significantly associated with gender ($\chi^2(1)=4.388$, $p=0.036$), but in this case, boys ($OR=1.51$) were more likely to eat these than girls. Eating bread and cheese or chips and chocolate were not significantly associated with gender ($p > 0.05$).

Binary logistic regression on predictors for skipping B@H by gender

Binary logistic regression was conducted to predict the contribution of the most frequent reasons for skipping B@H by

gender. Table 4 shows that boys who claimed that they were not hungry, had no time, or had no appetite, were 5.3, 2.7, and 3.5 times more likely to skip their breakfast, respectively. In contrast, not having time to prepare breakfast was not a statistically significant predictor of breakfast skipping ($p=0.863$) and managing body weight was not a statistically significant predictor of girls' skipping B@H ($p=0.225$).

Reasons for skipping B@H

Several reasons for skipping B@H were investigated. The results in Figure 1 showed that the top four reasons were,

Table 4. Binary logistic regression results of factors associated with breakfast skipping

Predictors	<i>B</i>	<i>Wald</i>	<i>EXP (B)</i>	<i>p</i>
Model 1: Male students				
Not feeling hungry	1.662	22.075	5.268	<0.001
Having no time	0.976	7.024	2.654	0.008
Having no appetite	1.253	8.437	3.50	0.004
No time to prepare	-0.095	0.03	0.909	0.863
Model 2: Female students				
To manage body weight	0.397	1.469	1.487	0.225

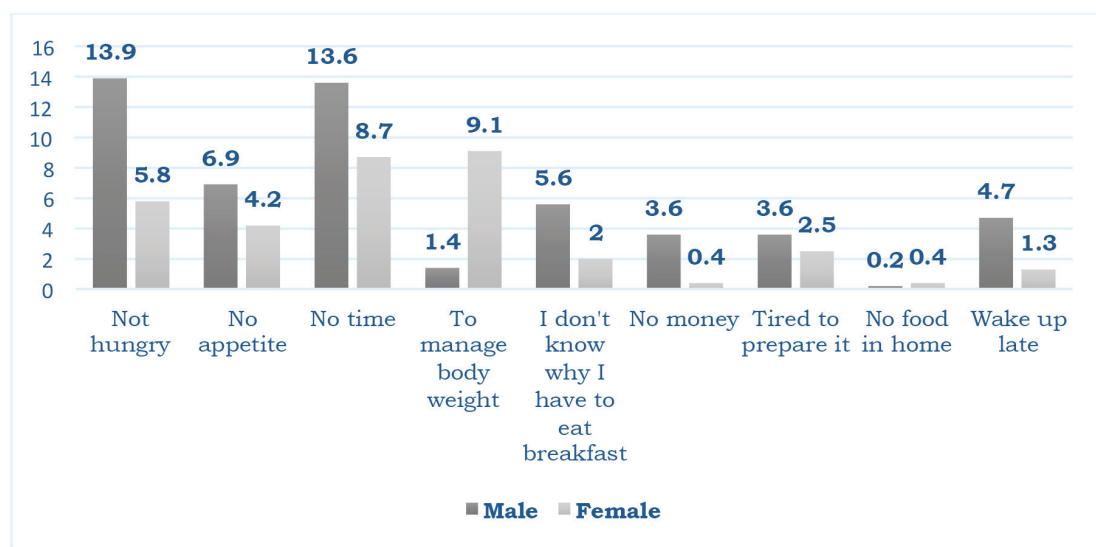


Figure 1. Reasons for skipping breakfast at home

comparing males and females, not feeling hungry (13.9% vs. 5.8%), had no time to eat (13.6% vs. 8.7%), had no appetite (6.9% vs. 4.2%), and no time to prepare it (6.9% vs. 2.5%). On the other hand, the main reason for females skipping breakfast compared to males was to manage body weight (9.1% vs. 1.4%).

DISCUSSION

This study found that 68.1% of participants skipped B@H four or more times per week, which is consistent with the findings of other studies (Abd El-Shaheed *et al.*, 2019; Al-Hazzaa *et al.*, 2020; Badrasawi, Anabtawi & Al-Zain, 2021). This number is considered high compared to other studies conducted among adolescents in Jordan, which reported just over a third (34.5%) regularly skipping breakfast (Abu-Mweis *et al.*, 2014; Ali *et al.*, 2019). The apparent differences between these results may be due to differences in the target study areas and practical definitions of skipping breakfast, the different age groups studied by the researchers, and a variety of research designs.

In the current study, skipping B@H was found to be more common among males than females, consistent with some other studies (Hu *et al.*, 2020; Yahia *et al.*, 2008), but differing from others which found that skipping breakfast was more common among females (AlBashtawy, 2015; Keski-Rahkonen *et al.*, 2003). It should be noted that some studies reported no significant difference by gender (Abu-Mweis *et al.*, 2014; Smith *et al.*, 2017; Yamamoto *et al.*, 2021). In the context of this study, higher breakfast skipping behaviour among males may be attributable to more autonomous behaviour among adolescent males and distorted views on nutritional status and requirements, shaped by peer group pressure, tradition, and living environments (AlBashtawy, 2017). This study found no relationship between income level and skipping breakfast, in contrast with other studies (Badrasawi *et al.*, 2021; Lobstein *et al.*, 2004), which found an association between high income and skipping breakfast.

The study found that those who ate B@H commonly ate various forms of

traditional mezza (including flatbread with cheese, falafel, hummus, and oil and thyme), and most preferred to drink tea with the meal (72.1%). However, the majority also reported regularly eating unhealthy breakfast, including chips and chocolate (67.4%). Most of the students' breakfast were prepared by their mothers. A study conducted in Jeddah (Saudi Arabia) reported that 41.0% of school children ate mezza with hard cheese, and 4.0-7.0% consumed bread with "labneh" (a soft cheese) or thyme, and 80.0% of breakfast were prepared by parents (Al-Hazzaa *et al.*, 2020). In an online survey conducted in Palestine with a sample of 193 students aged 12 to 14 years, it was found that 53.0% commonly consumed mezza (bread with cheese, labneh, thyme, and sausage), which was prepared by mothers in 74.8% of cases (Badrasawi *et al.*, 2021). Meals high in fat and sugar are a significant concern for this age group, which inhibit breakfast compliance. A study conducted in Bahrain with adolescents showed that the avoidance of fattening food was considered the main reason for dispensing breakfast, especially among females (Musaiger *et al.*, 2015). This may be due to cultural differences in these Arabic countries and the ways of living of both genders.

The results indicated that the main reason for skipping B@H among females was managing weight, which is in line with other studies (AlBashtawy, 2015; Badrasawi *et al.*, 2021). This result indicated a deep gap in understanding malnutrition between factual healthy habits versus beliefs; explained by adolescent females paying attention to their appearance and adopting independent opinions at this stage. School nurses and health controllers can play a key role in this regard by educating females about healthy eating habits to establish healthy foundations

for them at puberty. While it is necessary to address deep-seated psychosocial conditioning causing young girls to develop unhealthy eating behaviours due to body image issues, this is beyond the immediate scope of dietary and nutritional concern. Healthy eating can be promoted in alignment with existing attitudes by explaining that eating a healthy breakfast is actually conducive to avoiding overweight and obesity (Ma *et al.*, 2020).

It was also concluded that most adolescents skipped breakfast because they did not feel hungry, had no appetite, or had insufficient time, as mentioned by Badrasawi *et al.* (2021). The reason for insufficient time for B@H by adolescent students in the Badia Region could be explained by the nature of sleeping habits and geographical considerations. For instance, this remote area has limited transport facilities; thus, students wishing to arrive at school on time may skip B@H and eat it at school, or to skip it altogether. These results are similar to the reasons specified by AlBashtawy (2015), based on a study of adolescent students in different regions of Mafraq (the same Jordanian governorate as the current study). It was found that the important reasons for skipping breakfast were no appetite (65.0%), no time (60.0%), had no food available (60.0%), or no one attending breakfast (58.0%). This suggests that the nature of the living environment and customs in this Governorate and its regions require comprehensive study by researchers and stakeholders, for complete coverage in improving lifestyle and healthy nutritional habits.

A strength of the current study is that it was the first to have been conducted in the Badia Region of Jordan, which is considered a remote and deprived area facing numerous structural, economic, and resource challenges. More

importantly, it shed light on the reasons that led to adolescents skipping B@H in particular, and its associated challenges. The limitations of the present study included sample limited to a remote area in one governorate (Al-Mafraq) and a sample size of 552 male and female students from a specific category of adolescents. Therefore, the findings may not be applicable to students in other parts of Jordan or worldwide. There may also be a difference between what has been reported and the facts. This study used a cross-sectional design, but different methods may accurately identify the problem of skipping breakfast at home.

As the results of the present study showed that the prevalence of skipping breakfast at home was high, it is recommended to conduct educational programmes for raising awareness in a school setting to help promote nutritional health, motivate adolescents to eat B@H, and support the role of the family. Therefore, developing school nutrition courses to educate students and their parents on the importance of healthy nutrition may be implemented and, as a result, ensure scientific and cognitive development of these school students. It is also important to adopt a national strategy aimed at reducing skipping B@H by changing lifestyle and bad eating habits, as well as establishing systematic policies to develop and encourage nutritional health programmes in these areas. Practical solutions might include later school starting (and ending) times in rural areas, and active education on the health benefits of breakfast, including improved strength and maintaining a healthy weight (e.g., explaining that eating breakfast reduces overweight and obesity). Further, more research is needed for coverage of different regions of Badia and elsewhere in Jordan, with larger samples of adolescent students of varying age groups.

CONCLUSION

This study showed that the prevalence of skipping B@H was high among adolescent students for various reasons, including lack of time, not feeling hungry, managing weight, and insufficient knowledge on the importance of a healthy breakfast. The consumption of B@H was more evident on weekends and in the presence of the family. Breakfast consumption at home should be promoted among adolescent students in Badia schools, especially among males. Understanding the reasons and factors that contribute to skipping breakfast may contribute to solving the problem. The family has an active role to play in motivating children to eat B@H during this sensitive stage, improving healthy food choices and behaviours that will subsequently form a foundation for healthy living throughout the lifespan. In the immediate term, improved breakfast behaviour can help adolescents develop their cognitive skills to enhance their academic attainment and consequent socio-economic prospects.

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Authors' contributions

Masalha A, AlBashtawy MS, Abdalrahim A, Suliman M; principal investigators, conceptualised and designed the study, prepared the draft of the manuscript and reviewed the manuscript; Masalha A, Abubaker N, Hamadneh S, Alyahya MS, Aljezawi M, AlKhalwaldeh A, Alshloul D, led the data collection in the Badia region, advised on data analysis and interpretation, and reviewed the manuscript; Masalha A, AlBashtawy MS, Alshloul MN, conducted the study, data analysis and interpretation, assisted in drafting of the manuscript, reviewed the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

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