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Original Article

Psychosocial and emotional well-being of Syrian refugee children and adolescents in Jordan: In-camp versus out-of-camp comparative analysis

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Abstract

There is a notable gap in understanding how different living arrangements influence the psychosocial and emotional well-being of Syrian refugee children and adolescents. Moreover, limited literature exists on the comparison between in-camp and out-of-camp living situations. The aim of this study was to compare the psychosocial and emotional status between camp and non-camp Syrian refugee children and adolescents living in Jordan. A nationwide school survey was conducted in Jordan from December 2022 to April 2023 and targeted children (8–11 years) and adolescents (12–18 years), encompassing Jordanians, Syrians, and Palestinians, both in camps (camp refugees) and urban areas (urban refugees). In this paper, the analysis was limited to Syrian refugees. A total of 1,420 children and 1,249 adolescents were included. Children in camps had higher rates of hyperactivity (12.7% vs 8.3%) and total difficulties (19.3% vs 13.9%) compared to urban dwellers. However, they had lower rates of bedtime problems (12.8% vs 17.0%) and problematic internet use (19.9% vs 34.8%). Camp adolescents had higher rates of separation anxiety disorder (44.0% vs 37.8%) and conduct problems (22.2% vs 15.0%), but lower rates of poor physical functioning (43.3% vs 52.3%) compared to urban adolescents. Adjusted analysis showed lower odds of generalized anxiety disorder (OR=0.59), problematic internet use (OR=0.39), and bedtime problems (OR=0.67) for camp children. However, they had higher odds of emotional symptoms (OR=1.47), hyperactivity (OR=2.08), and overall difficulties (OR=1.50). Camp adolescents had higher odds of overall difficulties (OR=1.49) but lower odds of poor physical functioning (OR=0.67) compared to urban adolescents. In conclusion, children in refugee camps had lower rates of problematic internet use and bedtime issues but higher rates of hyperactivity and overall difficulties than urban children. Similarly, camp adolescents faced more total difficulties but reported better physical functioning than their urban peers. The complex interplay between living conditions and well-being underscores the need for tailored mental health interventions for displaced populations.

Keywords: Syrian refugee children, psychosocial life, emotional disorder, camp refugee, urban refugee

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Introduction

The Syrian conflict has led to the displacement of millions of people. Approximately 5.5 million Syrian refugees live in Turkey, Lebanon, Jordan, Iraq, and Egypt [1]. The hosting arrangements for refugees vary from one country to another. Refugee camps are usually designed to temporarily host refugees [2,3], secure their safety, and foster a sense of community among them. However, the living arrangements in camps might constrain refugees' rights, freedoms, and economic activities. Refugees living in camps usually struggle with many problems, such as poverty, harsh climatic conditions, inadequate housing, scarcity of food resources, and limited access to sanitation facilities, educational infrastructure, and healthcare services [4]. On the other hand, refugees living outside of camps may experience increased freedom, integration, and economic participation. However, they might struggle to afford rent and may live in substandard housing. Whether refugees live within or outside of camps, they have the right to receive assistance, live with dignity, experience fewer socio-economic vulnerabilities, and have a good quality of life [5].

Jordan currently hosts approximately 660,000 registered refugees, with 135,000 residing in camps, specifically Zaatari and Al Azraq [6], while 523,000 live in urban areas [7]. Notably, Zaatari camp stands as one of the world's largest refugee camps and currently hosts the highest number of Syrian refugees globally. Established in July 2012, it is situated just 10 km from Mafraq city, near the Jordan-Syrian border, and currently accommodates approximately 77,497 refugees, surpassing its official capacity of 60,000 [6,7]. The United Nations High Commissioner for Refugees (UNHCR) and other non-governmental organizations provide targeted assistance to camp residents in the form of cash and sometimes "in-kind" core relief items (CRIs) such as blankets, cooking utensils, and bed sheets. The camp administration also facilitates employment by issuing work permits. Schools and health centers in proximity to the camps benefit not only refugees but also the surrounding communities.

In Jordan, the majority of Syrian refugees have opted to settle outside of camps to enhance their employment opportunities. However, numerous reports highlight that refugees living outside of camps often endure substandard living conditions, engage in informal employment, and struggle with exorbitant rental costs [2,8]. Both camp and non-camp Syrian refugees in Jordan encounter obstacles in labor market integration. Camp residents face several challenges including food insecurity, substandard living conditions, limited access to public amenities, and limited employment opportunities [9-11]. These distinct challenges place camp refugees at a disadvantage compared to their counterparts outside camps and affect their mental and physical functioning and overall quality of life [9].

Several challenges related to nutrition, health care, education, employment, and housing disproportionately affect refugees' quality of life compared to the host population. However, the extent to which these challenges affect refugees may vary depending on their living arrangements, whether within or outside of camps. Previous research has widely recognized the Syrian refugee as the most severe refugee situation globally and documented its impact on the quality of life for both host populations and Syrian refugees [10-12]. However, there remains a notable gap in understanding how different living arrangements influence the psychosocial well-being of Syrian refugee children and adolescents. Moreover, limited literature exists on the comparison between in-camp and out-of-camp living situations. Thus, the aim of this study is to compare the psychosocial and emotional status between camp and non-camp Syrian refugee children and adolescents living in Jordan.

Methods

Study design and sampling

A national school-based survey was conducted among Jordanian children and adolescents as well as those of other nationalities and groups, such as Syrian and Palestinian refugees aged between 8 and 18 years, during the period from December 2022 to April 2023. This study utilized a multi-stage stratified cluster sampling technique to select a nationally representative sample. For school selection, the sample aimed to achieve coverage of basic and secondary education in the Ministry of Education (MoE), the private sector, and the United Nations Relief and Works Agency

(UNRWA) for Palestine refugee schools in Jordan. The school population was stratified into different explicit strata. A systematic sample of schools was selected from each stratum. All classes (grades 3–12) in the selected schools were included and each class was defined as a unit for data collection. The study enrolled a total sample size of 8,000 children and adolescents, with 2,669 of them identified as Syrian refugees. Among these, 549 children and 510 adolescents were residing in camps, while 871 children and 739 adolescents were living in urban settings. Following the study objective, the analysis focused on data relevant to children and adolescents of Syrian refugees living in camps (camp refugees) and those residing outside the camps (urban refugees). The sample size and power calculations were conducted to ensure statistical robustness. The minimum sample size needed for each group of children and adolescents to detect a difference of 10% in the prevalence of any psychosocial problems between camp and urban refugees, at a power of 80% and an alpha level of 0.05, was estimated at 291. The number of participants exceeded the minimum sample size.

Data collection

Prior to data collection, data collectors received extensive training on various aspects of the data collection process, including ethical considerations, the importance of maintaining confidentiality, and best communication practices with the target population. Trained data collectors visited the selected schools and distributed the questionnaires to the target groups. Students in grades 7 to 12 (ages 12–18, referred to as the adolescent group) self-administered the questionnaire and were asked to complete it during class. Students in grades 3 to 6 (ages 8–11, referred to as the children group) received a proxy parent version of the questionnaire, which their parents were asked to complete. Data collectors provided clear information about the purpose of the study, voluntary participation, confidentiality, and anonymity. A written informed consent for their participation was obtained from the legal guardians. The adolescent group was asked to maintain adequate physical spacing when completing the questionnaires to minimize the risk of social desirability and to ensure genuine responses. Special care was taken to convey the survey information in clear and understandable language. Principals were contacted in advance to arrange data collection. Data collectors stayed with students to answer questions and maintain privacy.

Study instruments

The choice of the instruments was guided by a literature review on the topic and by consultation with a group of experts that included a psychologist, a sociologist, a family physician, and two epidemiologists. The study questionnaires are internationally recognized and validated in English. All standardized questionnaires, including the students' and parents' versions, were used after obtaining the approval of use from the developer or the ones who own the copyright. The survey included two versions, a proxy parent version for the parents of children group and a self-report version for the adolescent group. For the instruments that have only self-report versions, questions were re-worded by the research team to reflect parents' responses about their children's cases.

The selected instruments were translated into the Arabic language using a forward-backward method and culturally adapted, in cases where an Arabic language was unavailable. Two bilingual experts independently performed a forward translation of all questionnaires. Based on a consensus meeting a single preliminary Arabic version was formed. This version was translated back into English independently by two other bilingual experts. An expert committee consisting of two forward translators, one backward translator, two clinical health scientists, and one epidemiologist reviewed the original tools and each translated version, which resulted in a pre-final version of the Arabic tool. Special attention was devoted to the clarity of items to allow for similar cognitive processing by the respondents. The survey was anonymous, and respondents had the right to skip questions or discontinue the survey if questions made them feel uncomfortable. The supplementary file shows the findings of the reliability analysis of the used tools. All selected tools were combined and structured in one questionnaire. The first section of the questionnaire included questions related to schools' characteristics, socio-demographic characteristics, and health status.

The Revised Child Anxiety and Depression Scale (RCADS) was used to measure symptoms of anxiety and depression in children and adolescents aged between 8 to 18 years [13]. The RCADS consists of 47 items rated on a 4-point Likert scale (i.e., never=0, sometimes=1, often=2, and always=3). The scale yields two total scales, and 6 subscales, corresponding with the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) classifications for anxiety and depressive disorders. The 6 subscales include separation anxiety disorder (SAD), generalized anxiety disorder (GAD), panic disorder (PD), social phobia (SP), obsessive-compulsive disorder (OCD), and major depressive disorder (MDD). The two total scales include the total anxiety score (the sum of the five anxiety subscales) and the total internalizing scale (the sum of all six subscales). The RCADS is available in two versions, a self-report and a parent version, both of which capture symptoms of anxiety and depression across all total scales and subscales. RCADS scores were calculated using an automated Excel scoring sheet publicly available by the developer. The scoring sheet utilized United States norms and required input of grades and gender. Raw scores were first calculated and then converted to T-scores. In the current study, cut-off points of T-scores of 70 or more were used to categorize those with anxiety and depression symptoms for all total scales and subscales, following the recommendations stated in the RCADS user guide [13]. According to the guide, a converted score of 70 or more indicates a clinical range of symptoms which is scores above the clinical threshold.

The Strengths and Difficulties Questionnaire (SDQ) was used to assess emotional and behavioral problems. SDQ is a brief emotional and behavioral screening questionnaire for children and young people, asking about 25 attributes, some positive and others negative [14]. The SDQ is available in self-report and parent versions. Respondents were asked to rate the statements on a 3-point Likert scale (not true, somewhat true, and certainly true), with a mixture of positive and negatively phrased items. The 25 items are divided into 5 scales of 5 items each, generating scores for emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior, for each of the subscales, the scores can range from 0–10 scale. A total difficulties score is generated from the sum of the four sub-scales of emotional symptoms, conduct problems, hyperactivity, and peer problems (20 items). Some items were reversed scored. Subscale scores were only calculated if at least three of the five items had been completed. The cutoff values for defining the abnormal attributes for parents' versions were as follows: total difficulties score (17–40), emotional problems (5–10), conduct problems (4–10), hyperactivity score (7–10), peer problems (4–10) and prosocial behavior (0–4). The cutoff values for defining abnormal attributes for students' versions were used as follows: total difficulties (20–40), emotional problems (7–10), conduct problems (5–10), hyperactivity (7–10), peer problems (6–10) and prosocial behavior (0–4) [14]. Higher scores on the difficulties subscales (emotional problems, conduct problems, hyperactivity, and peer relationship problems) indicate greater levels of difficulties, whereas higher scores on the prosocial behavior subscale indicate positive social behavior.

The Children's Impact of Event Scale-13 (CRIES-13) was used to assess symptoms of childhood post-traumatic stress disorder (PTSD). It is a 13-item measure and can be used with children 8 years and older [15,16]. CRIES-13 is a self-report scale; therefore, for this study, a proxy parent version was developed by rewording the self-report scale to reflect the parents' experiences or perceptions of the occurrence of various comments of people who had stressful lives in the case of their children. The scale consists of an overall scale and three subscales with 4 items measuring intrusion, 4 items measuring avoidance, and 5 items measuring arousal. Items are scored on a four-point nonlinear scale: not at all (0), rarely (1), sometimes (3), and often (5). The overall CRIES score is the total sum of all items. A cut-off score of 30 on the total scale was described as effective for screening cases of PTSD and was therefore used to categorize those with PTSD symptoms from those without [15].

The Pediatric Quality of Life Inventory (PedsQL) was used to assess quality of life. It is a 23-item scale measuring the health-related quality of life in children and adolescents [17]. It assesses five domains including physical functioning (eight items), emotional functioning (five items), social functioning (five items), and school functioning (five items). It includes core health dimensions delineated by the World Health Organization (WHO), including the role of school functioning. It has three summary scores including a total scale score (23 items), physical health

summary score (8 items), and psychosocial health summary score (15 items). The generic core scales have parallel child self-report and parent proxy-report formats. Items are rated on a 5-point Likert scale from 0 (never) to 4 (almost always), with a higher score indicating a better health-related quality of life. Items are scored in reverse order and then linearly converted to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, and 4=0. Published cutoff scores were used to categorize the poor quality of life across all domains, including total, physical, emotional, social, and school functioning domains. For scores less than 78, 88, 75, 80, and 70 in the respective domains, individuals were classified as having poor quality of life [18]. Higher scores indicate a better quality of life.

Short questions were used to address diet. The questions were adapted from the Many Rivers Short Food Frequency Questionnaire (MRSSFQ) [19]. Four questions were used to explore dietary habits in terms of the frequency of eating fruit and vegetable servings per day. One fruit serving was defined as one medium piece or two small pieces of fruit and this includes all fresh, dried, frozen, and tinned fruit. One vegetable serving was defined as half a cup of cooked vegetables or one cup of salad vegetables. Additionally, junk food consumption frequency was examined using names that are commonly used in Jordan. A fourth question addressed dietary behavior in terms of eating while watching television, or on mobile phones or tablets.

Short questions on physical activity that have been validated by Prochaska *et al*. were used [20]. Four questions were used to examine the frequency of weekly engagement in light and vigorous physical activity and the estimated time spent watching television, mobile phones, or tablets for entertainment purposes.

The 'BEAR'S' instrument was used to assess sleep disorders. It is divided into five major sleep domains, providing a comprehensive screen for the major sleep disorders affecting children aged 2 to 18 years old [21]. Each sleep domain has a set of age-appropriate 'trigger questions' for use in the clinical interview. BEAR'S is the acronym of B as bedtime problems, E as excessive daytime sleepiness, A as awakening during the night, R as regularity and duration of sleep, and S as snoring. The research team developed an Arabic version for this scale using forward-backward translation for parent's and children's versions.

The Problematic Internet Use Questionnaire (PIUQ-6) was used to assess three key factors in problematic internet use (PIU), including obsession (i.e., obsessive thinking about the internet and mental withdrawal symptoms caused by the lack of internet use), neglect (i.e., neglect of basic needs and everyday activities), and control disorder (i.e., difficulties in controlling internet use) [22]. A five-point Likert scale ("never," "rarely," "sometimes," "often," and "always/almost always") was used to evaluate how much the given statements characterized the respondents. Scores range from 6 to 30, with higher scores indicating a higher risk of PIU. Since the PIUQ-SF-6 is a self-report questionnaire, a proxy version for parents was developed by rewording the self-report version to report parents' perspectives. In the current study, a cut-off score of higher than 15 was used to classify those at risk of problematic Internet use, based on the acceptable sensitivity and specificity analyses of one study.

Three questions were asked to assess smoking and tobacco use, including the use of conventional cigarettes, electronic cigarettes, and waterpipe (shisha). For each product, a user was defined as a daily or occasional user of the product that is answering every day or some days).

Pilot testing

A pilot test was conducted to evaluate the content of the surveys and the data collection process. The pilot testing was conducted in two schools in Irbid and Mafraq in northern Jordan on November 7, 2022. The school in Irbid is a girls' school for Jordanian nationals and the school in Al Mafraq is located in the Zaatari camp for Syrian refugee boys. A total of 30 students from grades seven to twelve, 15 from each school, were asked to complete the student questionnaire, and 30 children from grades three to six, 15 from each school, were asked to send the questionnaire to their parents. The changes identified in the piloting phase were reflected in the parent and student versions in both languages.

Quality assurance

The main researchers conducted regular data quality assurance by comparing the data entered with the responses on the paper-based questionnaires and setting restrictive data ranges on the

Excel sheets. The main researchers also observed data collection over the course of the study to ensure adherence to data collection procedures. To ensure systematic quality monitoring, a checklist of key data collection quality indicators was used, including whether students were informed of the survey prior to the start of data collection.

Statistical analysis

Frequencies and percentages were used to describe categorical variables. The Chi-squared test was used to compare the characteristics of the participants and the prevalence rates of psychosocial, emotional, and behavioral problems between camp and urban refugee children and adolescents. The difference between camp and urban refugees was tested for each dependent variable in a separate logistic regression model, with adjustments made for various factors including gender, duration of stay in Jordan, parental living status, educational attainment of parents, family income, medication use for chronic illnesses, family history of psychological issues, fruit and vegetable intake, and physical activity. A *p*-value of less than 0.05 was considered statistically significant. Data were analyzed using IBM SPSS 24 (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.).

Results

Participants' characteristics

Among the Syrian refugees surveyed, 1,420 (53.2%) were children aged between 8 and 11 years, while 1,249 (46.8%) were adolescents aged between 12 and 18 years, resulting in a total of 2,669 participants. Of the children, 549 (40.7%) resided in camps, whereas 871 (59.3%) lived in urban areas. Similarly, 510 (40.8%) of the adolescents were from camps, while 739 (59.8%) were from urban settings. The socio-demographic characteristics of the sample population are presented in **Table 1**. Significant differences were observed in family income ($p<0.001$ for both age groups). Among the children, 91.6% of camp refugees had a family income of less than Jordanian Dinar (JOD) 300, compared to 78.6% of the urban population. Among adolescents, 87.5% of those residing in camps and 65.8% of those living outside the camps had a family income of less than JOD 300.

Prevalence rates of psychosocial, emotional, and behavioral problems

The prevalence rates of mental, psychosocial, emotional, and behavioral problems among camp and urban refugee children and adolescents are presented in **Table 2**. Compared to children living in urban areas, those living in camps had significantly higher prevalence rates of hyperactivity (12.7% vs 8.3%) and total difficulties (19.3% vs 13.9%). Conversely, children living in camp exhibited significantly lower prevalence rates of bedtime problems (12.8% vs 17.0%) and problematic internet use (19.9% vs 34.8%) compared to their urban counterparts.

Similarly, adolescents residing in camps demonstrated a significantly higher prevalence of separation anxiety disorder (44.0% vs 37.8%) and conduct problems (22.2% vs 15.0%) compared to those living in urban areas (**Table 2**). However, adolescents living in camps exhibited a significantly lower prevalence of poor physical functioning (43.3% vs 52.3%) than their urban counterparts. The prevalence of other conditions did not vary significantly between camp and urban refugees for both children and adolescents (**Table 2**).

Adjusted analysis

In the adjusted analysis (**Table 3**), several significant differences emerged after adjusting for important variables including gender, duration of stay in Jordan, parental living status, educational attainment of parents, family income, medication use for chronic illnesses, family history of psychological issues, fruit and vegetable intake, and physical activity. Among children, those residing in camps exhibited significantly lower odds of generalized anxiety disorder (OR=0.59), problematic internet use (OR=0.39), and bedtime problems (OR=0.67) compared to their urban counterparts. Conversely, children living in camps demonstrated higher odds of experiencing emotional symptoms (OR=1.47), hyperactivity (OR=2.08), and overall difficulties (OR=1.50) than those in urban areas. Concerning adolescents, those living in camps were more likely to experience overall difficulties (OR=1.49) and less likely to report poor physical functioning (OR=0.67) compared to adolescents residing in urban settings (**Table 3**).

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Table 1. The socio-demographic and relevant characteristics of Syrian children and adolescents residing in camps and urban areas

Variables	Children (8–11 years)				*p*-value	Adolescents (12–18 years)				*p*-value
	Camp refugees		Urban refugees			Camp refugees		Urban refugees		
	n	%	n	%		n	%	n	%	
Gender					<0.001*					<0.001*
Male	285	51.9	334	38.3		279	54.7	313	42.4	
Female	264	48.1	537	61.7		231	45.3	426	57.6	
Staying period					0.003					0.001
≤10 years	450	87.9	630	81.6		320	68.2	405	58.5	
>10 years	62	12.1	142	18.4		149	31.8	287	41.5	
Parent living status					0.419					0.114
Living together	503	91.6	780	89.6		456	89.4	631	85.4	
Separated	24	4.4	45	5.2		24	4.7	47	6.4	
One or both are deceased	22	4.0	46	5.3		30	5.9	61	8.3	
Mother's education					0.737					0.369
Diploma or higher education	54	9.8	81	9.3		55	10.8	92	12.4	
Less than diploma	495	90.2	790	90.7		455	89.2	647	87.6	
Father's education					0.189					0.461
Diploma or higher education	65	11.8	84	9.6		78	15.3	102	13.8	
Less than diploma	484	88.2	787	90.4		432	84.7	637	86.2	
Employed father	226	41.2	586	67.3	<0.001*	216	42.4	497	67.3	<0.001*
Employed mother	46	8.4	42	4.8	0.007	67	13.1	84	11.4	0.345
Family income					<0.001*					<0.001*
<JOD 300	503	91.6	685	78.6		446	87.5	486	65.8	
JOD 301–500	42	7.7	172	19.7		56	11.0	195	26.4	
>JOD 500	4	0.7	14	1.6		8	1.6	58	7.8	
Medications used for chronic illnesses	26	4.7	40	4.6	0.900	49	9.6	80	10.8	0.487
Family history of psychological issues	32	5.8	79	9.1	0.027	56	11.0	52	7.0	0.015
Fruit intake (daily servings)					0.272					0.305
0	72	14.3	107	12.8		59	12.6	97	14.0	
1 to 2	372	74.0	647	77.7		323	69.0	447	64.7	
3 or more	59	11.7	79	9.5		86	18.4	147	21.3	
Vegetable intake (daily servings)					0.019					0.443
0	39	7.7	49	5.9		44	9.5	80	11.6	
1 to 2	385	75.8	686	82.2		309	66.5	439	63.4	
3 or more	84	16.5	100	12.0		112	24.1	173	25.0	
Light activity					<0.001*					0.217
No activity	124	26.1	302	37.4		136	31.4	211	34.4	
1 to 4 days	309	65.1	458	56.8		269	62.1	351	57.2	
≥5 days	42	8.8	47	5.8		28	6.5	52	8.5	
Vigorous activity					0.295					0.321
No activity	290	57.9	510	62.0		192	41.7	285	44.5	
1 to 4 days	194	38.7	290	35.3		249	54.1	321	50.1	

Variables	Children (8–11 years)				*p*-value	Adolescents (12–18 years)				*p*-value
	Camp refugees		Urban refugees			Camp refugees		Urban refugees		
	n	%	n	%		n	%	n	%	
≥5 days	17	3.4	22	2.7		19	4.1	35	5.5	
Cigarettes or waterpipe smoking	8	1.6	10	1.2	0.550	108	22.2	148	21.2	0.689

JOD: Jordanian Dinar

* Statistically significant at $p<0.001$

Table 2. Psychosocial, emotional, and behavioral problems among camp and urban Syrian refugee children and adolescents

Variables	Children (8–11 years)				*p*-value	Adolescents (12–18 years)				*p*-value
	Camp refugees		Urban refugees			Camp refugees		Urban refugees		
	n	%	n	%		n	%	n	%	
Separation anxiety disorder (SAD)	231	42.5	352	40.8	0.534	219	44.0	277	37.8	0.030
Generalized anxiety disorder (GAD)	57	10.4	107	12.3	0.275	67	13.4	106	14.4	0.609
Panic disorder (PD)	145	26.6	210	24.4	0.364	190	38.2	256	35.1	0.266
Social phobia (SP)	74	13.6	132	15.4	0.363	38	7.6	42	5.7	0.185
Obsessive-compulsive disorder (OCD)	264	48.2	372	42.9	0.052	183	37.3	299	41.2	0.171
Major depressive disorder (MDD)	137	25.4	212	25.0	0.852	131	26.6	185	25.6	0.675
Total anxiety	183	33.9	281	33.1	0.772	158	32.5	210	29.1	0.205
Emotional symptoms	140	25.7	187	21.5	0.069	71	13.9	97	13.1	0.682
Conduct problems	98	18.0	124	14.3	0.061	113	22.2	111	15.0	0.001
Hyperactivity	69	12.7	72	8.3	0.007	50	9.8	85	11.5	0.344
Peer problems	102	18.8	159	18.3	0.839	98	19.3	115	15.6	0.090
Prosocial behavior	29	5.3	29	3.3	0.067	63	12.4	94	12.7	0.851
Total difficulties	105	19.3	121	13.9	0.007	113	22.2	131	17.8	0.052
Post-traumatic stress disorder	90	27.4	169	30.2	0.362	148	36.4	203	33.8	0.398
Poor total quality of life	110	20.1	184	21.2	0.616	175	34.4	273	37.1	0.318
Poor physical functioning	199	36.8	363	42.0	0.052	218	43.3	383	52.3	0.002
Poor emotional functioning	117	21.7	218	25.3	0.129	213	42.4	342	46.7	0.137
Poor social functioning	122	22.4	162	18.7	0.093	146	28.7	227	31.0	0.388
Poor school functioning	130	24.2	184	21.4	0.216	164	32.5	269	37.0	0.107
Bedtime problems	67	12.8	145	17.0	0.037	167	34.2	245	35.2	0.728
Excessive daytime sleepiness	196	37.5	315	36.7	0.776	223	46.7	341	48.9	0.444
Awakenings during night	87	16.7	169	19.7	0.160	285	58.9	407	58.4	0.866
Snoring	58	11.2	116	13.6	0.203	85	18.0	126	18.1	0.985
Problematic internet use	100	19.9	289	34.8	<0.001*	203	42.3	317	46.2	0.185

* Statistically significant at $p<0.001$

Table 3. Multivariate analysis of differences in psychosocial and emotional problems between camp and urban refugees for both children and adolescents (camp refugees vs urban refugees)

Dependent variables	Children (8–11 years)			*p*-value	Adolescents (12–18 years)			*p*-value
	OR	95%CI			OR	95%CI		
		Lower	Upper			Lower	Upper	
Generalized anxiety disorder (GAD)	0.59	0.38	0.91	0.018	1.04	0.68	1.59	0.848
Panic disorder (PD)	0.91	0.66	1.25	0.558	1.07	0.79	1.46	0.665
Social phobia (SP)	0.85	0.58	1.25	0.409	1.41	0.79	2.52	0.241
Obsessive-compulsive disorder (OCD)	1.08	0.82	1.42	0.582	1.02	0.75	1.40	0.881
Major depressive disorder (MDD)	0.88	0.64	1.22	0.438	0.96	0.68	1.35	0.811
Total anxiety	0.86	0.64	1.16	0.324	1.30	0.93	1.81	0.119
Emotional symptoms	1.47	1.07	2.03	0.018	1.28	0.84	1.95	0.249
Conduct problems	1.30	0.89	1.88	0.171	1.47	0.99	2.19	0.058
Hyperactivity	2.08	1.34	3.21	0.001	0.96	0.60	1.52	0.847
Peer problems	0.89	0.62	1.28	0.540	1.36	0.92	2.01	0.123
Prosocial behavior	1.70	0.80	3.64	0.169	0.72	0.44	1.18	0.189
Total difficulties	1.50	1.05	2.15	0.027	1.49	1.03	2.15	0.033
Post-traumatic stress disorder	0.83	0.57	1.20	0.315	1.09	0.78	1.52	0.612
Poor total quality of life	0.86	0.61	1.21	0.382	1.02	0.75	1.39	0.906
Poor physical functioning	0.76	0.57	1.01	0.062	0.67	0.49	0.90	0.008
Poor emotional functioning	0.75	0.54	1.04	0.088	0.99	0.74	1.34	0.964
Poor social functioning	1.12	0.80	1.58	0.508	0.97	0.70	1.33	0.845
Poor school functioning	1.18	0.85	1.64	0.324	1.02	0.75	1.40	0.878
Bedtime problems	0.67	0.45	0.98	0.041	0.98	0.72	1.34	0.903
Excessive daytime sleepiness	1.12	0.85	1.49	0.423	0.99	0.74	1.33	0.946
Awakenings during night	0.71	0.49	1.01	0.060	1.20	0.88	1.63	0.243
Snoring	0.82	0.54	1.25	0.362	0.94	0.64	1.39	0.755
Problematic internet use	0.39	0.29	0.54	<0.001*	0.90	0.68	1.21	0.493

Each dependent variable is tested in a separate logistic regression model, with adjustments made for various factors including gender, duration of stay in Jordan, parental living status, educational attainment of parents, family income, medication use for chronic illnesses, family history of psychological issues, fruit and vegetable intake, and physical activity

* Statistically significant at $p<0.001$

Discussion

Psychosocial, emotional, and behavioral problems among children can have significant impacts on individuals, families, and society at large [23]. Failure to recognize and manage these problems in early childhood can exacerbate disorders later in life. Numerous studies have examined the behavioral and emotional challenges faced by Syrian refugee children in host countries, with many reporting higher rates of these problems among refugees compared to the host population [22,24-26]. One study has highlighted a high rate of suicidal ideation among this population [27].

However, studies that have directly compared children living in refugee camps to those residing outside of camps are scarce. This study aimed to address this gap and explore this critical issue. The findings from the adjusted analysis comparing psychosocial factors between refugee children living in camps and those living in urban settings revealed several significant differences. Children living in refugee camps exhibited lower odds of problematic internet use and bedtime problems compared to those living outside the camp. This could be attributed to the good access to basic amenities, the presence of community resources, social support networks, and the availability of services provided by humanitarian organizations in camp settings. Such resources and facilities available in camps may help to mitigate some stressors that urban refugee children face. The lower rates of problematic internet use among children in camps may be due to limited internet access within camps, resulting in reduced internet usage. Conversely, children living outside the camps often have better access to internet services.

On the other hand, children in camps demonstrated higher odds of experiencing hyperactivity and overall difficulties. This finding suggests that while camps may provide physical safety and basic amenities, they may lack adequate mental health support and recreational activities to address children's emotional needs. Additionally, the overcrowded living conditions in camps may contribute to increased stress and behavioral issues among children [28].

Adolescents in refugee camps were more likely to experience overall difficulties compared to their urban counterparts. This could reflect the cumulative effects of prolonged displacement and the challenges associated with adolescence, such as heightened emotional intensity and sensitivity, identity formation, and peer relationships. The lack of opportunities for education, vocational training, and recreational activities in camps may also contribute to adolescents' psychosocial problems [29]. Despite facing higher odds of overall difficulties, adolescents in refugee camps were less likely to report poor physical functioning. This finding suggests that camp environments may still offer relatively better access to healthcare services and physical activity opportunities compared to urban settings. However, as adolescents, both groups may face similar challenges regardless of their environment. Adolescence is a period of significant change and development, marked by identity formation, peer relationships, and increased independence. Refugee adolescents, whether in camps or urban areas, may encounter common stressors related to their developmental stage, such as navigating cultural identity, education, and employment opportunities. Additionally, they may face similar social and economic barriers as they transition into adulthood [30].

The differences in the psychosocial well-being of children and adolescents in refugee camps versus those outside of camps might be explained by different factors including exposure to trauma, access to healthcare services, availability of social support networks, experiences of discrimination and stigma, the impacts of displacement, the duration of camp residency, and the accessibility of educational and recreational opportunities [31]. Understanding and addressing these multifaceted factors are crucial for developing effective interventions to support the mental health of Syrian refugee youth in Jordan and similar contexts. In 2019, Fallah *et al.* reported that both camp and out-of-camp Syrian refugees in Jordan encounter challenges in labor market participation, with camp residents experiencing higher levels of food insecurity [32]. Also, camp refugees endure worse living conditions, often residing in smaller spaces with limited access to public facilities and possessing fewer durable assets [10]. A study by Ginn in 2020 discovered that out-of-camp refugees are more likely to work and have higher household earnings [11]. This study also revealed lower family income for children and adolescents living in camps compared to those living outside the camp. Further research has shown that refugees in camps are 36% more likely

to live below the national poverty line, indicating their struggle to meet daily basic needs [33]. They are also 37% more likely to live in overcrowded shelters, possess fewer household assets than refugees outside of camps, and report lower life satisfaction. Furthermore, 62% of camp refugees are at risk of living in abject poverty, compared to 28% of those living outside. Urban refugees may have better living conditions, including more spacious living accommodations and better access to sewage, water, electricity, and garbage disposal services [26].

This discussion underscores the critical influence of hosting arrangements on refugee mental health. The variations in mental health according to living conditions emphasize the importance of tailored interventions that consider the unique challenges and opportunities in both camp and urban settings. Addressing the mental health needs of these vulnerable populations requires the design of effective policies and programs accordingly. The limitations of our study include the potential for response bias during data collection and the cross-sectional design, which makes it challenging to establish accurate causal relationships between input variables and outcomes.

Conclusion

Children residing in refugee camps showed a reduced likelihood of facing problematic internet usage and bedtime problems in contrast to their urban counterparts. However, they exhibited increased odds of hyperactivity and overall difficulties. Similarly, adolescents in refugee camps were more prone to total difficulties compared to their urban peers. Nevertheless, adolescents in refugee camps reported better physical functioning, revealing a nuanced interplay between environmental factors and well-being in these populations. The unique challenges and protective factors associated with different living arrangements necessitate a targeted and holistic approach to address the mental well-being of displaced individuals.

Ethics approval

Ethical approvals were obtained from the Institutional Research Committees at Jordan University of Science and Technology (JUST), and Jordan Ministry of Health (MoH) on August 8, 2022. Number of ethical approval is 11/151/2022.

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Competing interests

All the authors declare that there are no conflicts of interest.

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Underlying data

Derived data supporting the findings of this study are available from the corresponding author on request.

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