Abstract

Introduction Psychiatric disorders are among the leading causes of disability in children and adolescents globally. In Lebanon, a country that has endured a prolonged history of conflict and economic and political uncertainty, mental health surveys in children and adolescents have been limited to specific disorders or specific settings or cities. PALS (Psychopathology in Children and Adolescents in Lebanon Study) is the first study to screen a nationally representative sample of children and adolescents for psychiatric disorders and estimate the national prevalence of children and adolescents at risk of having a psychiatric disorder.

Methods A nationally representative household sample of 1517 children and adolescents (aged 5 years 0 months to 17 years 11 months) was recruited through a multi-stage stratified proportionate sampling technique between February 2018 and November 2018. Parents and adolescents completed a battery of self-reported scales including the Strengths and Feelings Questionnaire (SDQ), Mood and Feelings Questionnaire (MFQ), Screen for Child Anxiety and Emotional Related Disorders (SCARED), the Peer Relations Questionnaire (PRQ), General Health Questionnaire (GHQ), and Conflict Behavior Questionnaire (CBQ), Child Revised Impact of Events Scale (CRIES), and a demographic/clinical information questionnaire. Logistic regression models were used to examine the correlates of screening positive for psychiatric disorders.

Results About a third of children and adolescents (32.7%, n = 497) screened positive for at least one psychiatric disorder, of whom only 5% (n = 25) reported ever seeking professional mental health help. Academic performance, having a chronic physical illness, higher parental GHQ scores, and involvement in bullying were associated with a higher odds of screening positive for a psychiatric disorder. Higher family income was negatively associated with screening positive for a psychiatric disorder.

Conclusion This first national study shows a high prevalence of psychiatric symptoms in Lebanese children and adolescents and an alarming treatment gap. School-based primary prevention programs or screening in primary care settings are key for early detection and management of psychiatric symptoms, and prevention of psychiatric disorders.

Keywords Epidemiology · Prevalence · Psychiatric disorders · Children · Adolescents
Introduction

Psychiatric disorders are among the most ubiquitous disorders, affecting almost 1 billion individuals worldwide [1]. Studies have shown an early age of onset for most psychiatric disorders [2, 3], which, if left unrecognized and untreated, can cause significant psychosocial impairment and an increased risk of developing another mental disorder [4].

There is poor “coverage” (proportion of the target population represented by the available data) of child and adolescent mental disorders prevalence data in the Middle East and North Africa region [5]. This includes Arab countries that have also shown to produce only 1% of the world output of peer-reviewed publications in mental health [6]. This dearth in mental health research in the Arab region may be a contributor to the shortage of policies and services targeted toward mental health, especially in children and adolescents [7]. In Lebanon, a country in the Middle East that has endured a prolonged history of conflict and economic and political uncertainty, epidemiological data on the prevalence of psychiatric disorders in children and adolescents remain limited. Given the role of armed conflict in the development of mental disorders in children [8] and the cultural stigma associated with reporting mental disorders in the Arab culture [9], it is crucial to assess the prevalence of mental health problems in Lebanese children and adolescents to guide public health prevention efforts. Previous research in Lebanon reported only on specific disorders [10, 11] or was limited to specific geographic areas [12]. Our group investigated the prevalence of psychiatric disorders in adolescents residing in the capital Beirut, and found a 30-day prevalence of 26% for any psychiatric disorder [12]. Having a psychiatric disorder was associated with parental marital status, not attending school, having a chronic medical condition, family history of psychiatric disorders, as well as being involved in bullying. Among children and adolescents with at least one psychiatric disorder, only 6% reported seeking professional mental health help [12]. While the study findings addressed a clear research gap, the sample was representative of Greater Beirut area only and was limited to adolescents.

In the present study, the Psychopathology in Children and Adolescents in Lebanon Study (PALS), we screened a nationally representative sample of children and adolescents for psychiatric disorders to (1) determine the prevalence of mental health problems (i.e., percentage of participants who screen positive for psychiatric disorders), (2) study the correlates of screening positive for different psychiatric disorders across different age groups (5–7 years and 11 months; 8 years to 11 years and 11 months; and 12–17 years and 11 months), and (3) examine the proportion of those seeking mental health care among those who screened positive for any psychiatric disorder. This is the first national study to screen for psychiatric disorders in children and adolescents in Lebanon, and to examine the degree of service utilization and treatment seeking behavior. Our findings would help assess the service needs of this population and identify high-risk groups to be prioritized for interventions.

Methods

Sampling and recruitment

A nationally representative household sample of non-institutionalized Arabic speaking children and adolescents (5 years 0 months–17 years 11 months) were recruited between February 2018 and November 2018.

A multi-stage stratified proportionate sample was drawn from 26 districts in Lebanon based on the residents’ data published in the Statistical Bulletin of the Ministry of Public Health in 2013 [13]. Each district was then divided into sampling units. The number of subareas (villages/towns) to be sampled from each district was proportionate to the population size of the district. The subareas in each district were randomly chosen and the number of participants to be recruited from each district was equally divided among the chosen subareas of the district.

In each subarea, multi-stage probability sampling was used. The first stage consisted of selecting relevant neighborhoods inside each subarea (village/town). Within each neighborhood, an important landmark (i.e., church, mosque, major establishment, etc.) was identified and the streets surrounding the landmark in all directions (North, South, East, and West) were covered. This was done given the lack of street sampling frames in Lebanon. The number of participants to be recruited from each selected village/town was equally distributed among the neighborhoods/streets.

On each street, data collectors surveyed an equal number of households, starting on opposite ends and sides of the street; one team of data collectors started from one end and the other team started from the opposite end. The first building on the right of the data collectors was selected, followed by every other building. Within the selected buildings, sampling started with the first floor and then every other floor. If there was more than one apartment on the floor, the first unit to the right of the elevators/stairs was selected. Households were eligible if they included at least one Arabic speaking Lebanese child/adolescent between the ages of 5 and 17 years 11 months. At the household level, only one child aged 5–17 years was randomly selected for an interview, in addition to one parent/guardian. Random
selection of the child was conducted by listing all children in ascending order (youngest to oldest) and selecting a number randomly using dice. If the randomly selected child was not available at the time of the visit, data collectors returned at a later pre-scheduled date/time. For children aged 5–8 years, only one of the parents was interviewed. For the older age groups, both the child/adolescent and one of the parents were interviewed separately. A total of 7598 households were approached, among which 4404 (57.96%) were either ineligible or eligibility could not be determined. Among the eligible households, a total of 1517 (47.50%) households agreed to participate and completed the surveys. Among those that were eligible, 179 (5.60%) did not complete the entire questionnaires, 1279 (40.04%) had parents that refused to participate, and 219 (6.86%) had children that refused to participate.

Data collection

Data collectors were recruited by a research company and were trained by our research team on the process of recruiting participants, obtaining informed consent, and collecting data for the present study. All fieldworkers successfully completed the Collaborative Institutional Training Initiative (CITI Program) certification as required by the Institutional Review Board (IRB). During the initial stages of data collection, and for data quality assurance purposes, a member of our research team shadowed and supervised the trained data collectors to ensure proper adherence to all procedures. Data collectors assisted participants who needed help in using the tablet when completing the self-rated scales, as well as helped children who needed assistance understanding certain questions.

Ethical considerations

The study was approved by the local IRB. Parents/legal guardians signed an informed consent document and permission for their child/adolescent to participate in the research study and children/adolescent aged 8 years 0 months to 17 years 11 months signed written assent forms. Data were collected via tablets by 2 research staff; one staff working with the parent, while the other with the child in a separate area of the house. Families who participated received a stationary kit as a token of appreciation.

If a participant (child or parent) reported suicidality, the data collector would receive a notification on the tablet of a possible risk. A clinical psychologist on the study team would then be contacted to talk to the participant and the legal guardians to assess the situation. A protocol was followed. If the case was deemed a non-emergency, the legal guardians would be advised to seek care. If the case was deemed an emergency, the legal guardians would be asked to go or take the participant to an emergency unit.

Instruments and measures

General information sheet

A general information sheet was first completed by a parent/legal guardian who provided information on basic demographics including family structure, family income, and parental level of education. The parent/legal guardian also completed questions regarding the selected child/adolescent’s academic performance, medical, developmental, and psychiatric history, as well as prenatal and antenatal history.

The Strengths and Difficulties Questionnaire (SDQ)-parent and child version

The SDQ, a 25-item, Likert scale, was used to screen for emotional, conduct, and hyperactivity difficulties in children aged 5–7 years and 11 months and for conduct and hyperactivity difficulties in children and adolescents between the ages of 8 years and 17 years and 11 months. We used an Arabic version of the SDQ that was validated in a sample of Yemeni children [14]. SDQ also measures the subjective impact of the problem, distress, and impairment. SDQ yields scores on Conduct Problems, Inattention-Hyperactivity, Emotional Symptoms, Peer Problems, Prosocial behavior, and Total Difficulties. A child/adolescent was considered having screened positive for an emotional disorder, hyperkinetic disorder, or conduct disorder if he/she had an abnormal score on the corresponding scales (either parent or child reported) along with an abnormal impact score as defined by the established cut-off points [15].

The Mood and Feelings Questionnaire MFQ-parent and child version

The MFQ is a 33 item self-report measure of depressive symptoms among children/adolescents aged 8–18 [4]. Both child and parent forms consist of 33 one-sentence items, rated on a three-point Likert scale with the parent form including one additional item addressing the parent’s observation of the child’s response to praise. A validated Arabic version along with the established local cut-off scores for parents and children in a clinical setting in Lebanon was used [16]. A child or adolescent was considered having screened positive for depression if the child or parent scored higher than 26 and 22, respectively.
Screen for Child Anxiety Related Emotional Disorders (SCARED)-parent and child version

The SCARED is a self-report scale that screens for anxiety disorders in children and adolescents. It screens for Panic Disorder, Generalized Anxiety Disorder, Separation Anxiety Disorder, Social Anxiety Disorder, and Significant School Avoidance. SCARED was completed by children and adolescents aged 8–18 and one parent/guardian and cut-off scores previously established in the Lebanese population were used [17]. A child or adolescent was considered having screened positive for an anxiety disorder if the child or parent/guardian scored higher than 26 and 24, respectively.

Child Revised Impact of Events Scale (CRIES 8)

The Impact of Events Scale (IES) was originally developed to examine the re-experiencing of a traumatic event and of avoidance of that event and the feelings associated with it. The current version is designed for use with children aged 8 years and above, and consists of four items that measure intrusion and four items that measure avoidance. The CRIES 8 has been previously used to screen for post-traumatic stress disorder (PTSD) in a general population [18] with a cut-off score of 17 being considered as a positive screen [19, 20].

Questionnaire on substance use

Adolescents aged 12 and above answered a questionnaire that assessed substance use and its frequency by the adolescent. Parent habits of substance use as perceived by the child were also assessed. Given the participants’ age of less than 18, an adolescent was considered to screen positive for substance use disorder if she/he used more than few puffs of cigarettes or water pipe or few sips of alcohol in the past 30 days.

Conflict Behavior Questionnaire (CBQ)

The Conflict Behavior Questionnaire (CBQ) is a battery used to assess conflict and interaction behaviors as perceived by parents (CBQ-P) and adolescents (CBQ-A). The 20 item CBQ was used and it consists of 20 true–false items assessing conflict within the parent–child relationship. The CBQ 20 was completed by the adolescent about each parent and by the parent/legal guardian about his/her relationship with the adolescent; higher scores were indicative of higher parent–child conflict.

The Peer Relations Questionnaire (PRQ)

The PRQ abbreviated version is a 12-item scale which assesses a child’s peer relations. It is composed of three subscales of 4 items each: victim subscale (PRQ-Victim), reflecting the degree to which the adolescent is bullied; bully subscale (PRQ-Bully), reflecting the degree to which the adolescent engages in bullying behavior; and prosocial behavior subscale (PRQ-Prosocial). Items are scored on a 4-point Likert type scale which are “0 = Never”, “1 = Once in a while”, “2 = Pretty Often”, or “3 = Often”. It is often administered to children and adolescents aged 12–18 years, but has also been used in children aged 8 and above [9]. As such children aged 8 and above completed the scale. Participants who responded with “pretty often” or “often” on at least one item of the PRQ-Victim subscale were categorized as “Victims of bullying”. A similar approach was used to identify “Bullies”. Participants were then categorized as bullies only, victims only, or both victims and bullies [21].

The General Health Questionnaire (GHQ-28)

The 12-item General Health Questionnaire (GHQ-28) screens for the current mental health status of the respondent (parent) [16]. It is scored on a 4-point Likert scale ranging from “better than usual” to “much less than usual”. The GHQ has been shown to have good validity and to be equally useful in developing countries as well as when translated to different languages [22].

Data analysis

Based on the different battery of scales they completed, participants were stratified into three age groups: 5 years to 7 years and 11 months; 8–11 years and 11 months; and 12–17 years and 11 months. This was done given that not all children across all age groups completed the same battery of tests.

For children aged 5–7 years 11 months, a child was considered to have a positive screen for a psychiatric disorder if he/she screened positive for having a hyperactivity disorder, conduct disorder, and/or emotional disorder based on the SDQ. Children between the ages of 8–11 years 11 months were considered to screen positive for any psychiatric disorder if they screened positive for hyperactivity disorder (based on SDQ), conduct disorder (based on SDQ), anxiety disorder (based on SCARED), depressive disorder (based on MFQ), and/or PTSD (based on CRIES). Participants between the ages of 12 years and 17 years–11 months were considered to screen positive for a psychiatric disorder if they screened positive for hyperactivity disorder, conduct disorder, anxiety disorder, depressive disorder, PTSD, and/or substance use disorder. Weighted analysis was conducted to account for sampling weights, based on the Central Administration of Statistics (CAS) estimates of the distribution of the Lebanese population across each district [23].
Mann–Whitney U tests and Kruskal–Wallis tests were used to compare non-normally distributed continuous variables across categorical variables. Associations between categorical variables were assessed using Pearson’s Chi-square test and Fisher’s exact test. For each age group, a multistep approach was followed to study the correlates of screening positive for any psychiatric disorder. First, Chi-square test and binary logistic regression were used to examine the bivariate associations between the various sociodemographic variables and screening positive for a psychiatric disorder. Next, variables statistically significant associated with the outcome variable [at \( p < 0.05 \)] at the bivariate level were grouped as follows: “Sociodemographic characteristics” (age, gender, family structure, parental education and employment and family income), “scholastic characteristics” (school performance, history of repeating grades and needing private tutoring or special accommodation at school as reported by parents), “parent and peer relationships” (bullying and conflict with parents), and finally “clinical characteristics” (psychiatric family history, having a chronic physical illness and parental mental health as measured by the GHQ). Next, within each of these categories, multivariate models were generated to explore adjusted associations with the outcome variables. Variables associated with the outcome at \( p < 0.05 \) were retained in the final multivariate models as a final step. This final step was done for “8 years to 11 years 11 months” and “12–17 years and 11 months” age groups separately but not for the “5–7 years and 11 months” age group given the smaller number of participants who screened positive in the latter group. Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 25.0. All analyses were weighted (including sampling weights).

## Results

### Population characteristics

Table 1 shows the sociodemographic characteristics of the sample. The sample included almost equal percentage of boys (50.22%) and girls (49.78%). The average age of the participants was 11 years (SD = 3 years). Out of the total sample of 1517 participants, 15.4% (\( n = 234 \)) were 5–7 years, 47.7% (\( n = 724 \)) were 8–11 years, 50.2% (\( n = 755 \)) were 12–17 years old. Almost (44.4%; \( n = 674 \)) of participants came from households whose monthly family income was less than 1000$. The majority of mothers (86.74%, \( n = 1304 \)) and fathers (84.3%, \( n = 1156 \)) had high school-level education or higher. At the time of the study, 14.4% of fathers (\( n = 241 \)) were not living with the participants.

### Table 1 Sociodemographic characteristics of the overall sample (\( N = 1517 \))

| Characteristic                        | \( n = 1517 \) |
|---------------------------------------|----------------|
| Age                                   | 10.57 (3.27)*  |
| Age group                             |                |
| 5–7.11 years                          | 234 (15.42)    |
| 8–11.11 years                         | 724 (47.73)    |
| 12–17.11 years                        | 559 (36.85)    |
| Gender                                |                |
| Male                                  | 762 (50.22)    |
| Female                                | 755 (49.78)    |
| Total monthly family income           |                |
| Prefer not to answer                  | 178 (11.72)    |
| Up to 1000$                           | 674 (44.41)    |
| 1000–2000$                            | 502 (33.09)    |
| More than 2000$                       | 163 (10.78)    |
| Parental marital status               |                |
| Not married                           | 116 (7.61)     |
| Married                               | 1401 (92.39)   |
| Mother’s employment                   |                |
| Unemployed                            | 1083 (72.01)   |
| Employed                              | 421 (27.99)    |
| Father’s employment                   |                |
| Employed                              | 1385 (91.29)   |
| Prefer not to answer                  | 132 (8.71)     |
| Parent’s education                    |                |
| Elementary or less                    | 199 (13.26)    |
| High school or less                   | 1033 (68.7)    |
| University or more                    | 271 (18.04)    |
| Father’s education                    |                |
| Elementary or less                    | 341 (22.77)    |
| High school or less                   | 921 (61.54)    |
| University or more                    | 235 (15.69)    |
| Mother not living at home             | 45 (2.95)      |
| Father not living at home             | 217 (14.31)    |
| Total number of individuals living at home | 5.09 (1.78)  |
| Parental assessment of child’s academic performance at school |          |
| Good—passes all classes without any problems | 1163 (76.65) |
| Acceptable—does well but has occasional difficulties with some subjects | 297 (19.6)    |
| Sub-optimal—fails some subjects or classes | 57 (3.75)    |
| Repeated at least one school grade    | 244 (16.07)    |
| Ever received home tutoring           | 175 (11.53)    |
| Ever received accommodation at school | 57 (3.75)      |
| Child has chronic physical illness    | 124 (8.34)     |
| Child ever sought mental health care  | 48 (3.23)      |
| Positive psychiatric family history   | 99 (6.52%)     |
| PRQ bully score                       | 1.09 (1.72)*   |
| PRQ victim score                      | 1.12 (1.80)*   |
| Parent GHQ total score                | 19.38 (10.30)* |
| Child reported CBQ score pertaining to father | 8.57 (22.73)* |
| Child reported CBQ score pertaining to mother | 9.26 (20.24)* |
Prevalence of a positive screen for psychiatric disorders and treatment seeking behavior

About a third (32.7%, n = 497) of the sample of children and adolescents screened positive for at least one psychiatric disorder. The prevalence estimate was distributed as follows in the three age categories: 3.0% (n = 7) of the children aged 5 to 7 years and 11 months, 31.6% (n = 229) in children aged 8–11 years and 11 months, and 46.6% (n = 261) in adolescents aged 12–17 years 11 months (Table 2). Among those who screened positive for a psychiatric disorder, 58.8% screened positive for one disorder and 41.2% screened positive for two or more disorders.

Screening positive for depression and PTSD was statistically significantly higher in the 12–17 years 11 months age group than in the 8–11 years 11 months age group. No age differences were noted for the prevalence of other psychiatric disorders. Gender differences in screening positive for specific psychiatric disorders only existed in children aged 12 and above where 27.41% of girls (n = 29) screened positive for anxiety disorders compared to 15.6% of boys (n = 42, p = 0.001). There were no other gender differences in screening positive for a specific psychiatric disorder in the other age groups.

Only 5% (n = 25) of children and adolescents who screened positive for a psychiatric disorder ever sought professional mental health help, though 74 (14.9%) of the children who screened positive were perceived by their interviewed parent to possibly need professional mental health care.

Correlates of screening positive for a psychiatric disorder

The final adjusted multivariate regression models delineated several correlates for screening positive for psychiatric disorders. These are listed below per age group (Tables 3, 4, 5):

Children aged 5–7 years 11 months

Repeating at least one school grade (OR 14.809; 95% CI [2.967, 73.915]), having a chronic physical illness (OR 12.929; 95% CI [2.601, 64.227]), having positive psychiatric family history (OR 20.286; 95% CI [4.130, 99.638]), and higher parental GHQ scores (OR 1.079; 95% CI [1.016, 1.146]) were associated with screening positive for a psychiatric disorder. Higher level of paternal education was negatively associated with screening positive for a psychiatric disorder in this age group (OR 0.613; 95% CI [0.411, 0.915]) (Table 3).

Children aged 8–11 years and 11 months

Having a chronic physical illness (OR 1.945; CI [1.052, 3.595]), higher parental GHQ scores (OR 1.058; CI [1.038, 1.078]), and higher PRQ victim scales indicating increased peer victimization (OR 1.325; CI [1.200, 1.460]) were associated with screening positive for a psychiatric disorder. Higher family income was negatively associated with screening positive for a psychiatric disorder (OR 0.402; CI [0.225, 0.720] and 0.381 [0.180, 0.806] for the income ranges $1000–2000 and more than 2000, respectively) (Table 4).

Children aged 12–17 years and 11 months

For children in the oldest age group, older age (OR 1.203; CI [1.072, 1.352]), female gender (OR 1.696; CI [1.143, 2.517]), suboptimal school performance (OR 2.990, CI [1.043, 8.568]), having a chronic physical illness (OR...
Table 3 Correlates of positive screens for psychiatric disorders in 5–7-year-old children

|                                      | Screened negative (n = 227; 96.98%) | Screened positive (n = 7; 3.02%) | Unadjusted OR [CI] |
|-------------------------------------|-------------------------------------|----------------------------------|--------------------|
| **Age**                             | Count (%)                           | Count (%)                        |                    |
|                                      | 5.88 (0.83)                         | 6.01 (0.57)                      | 1.201 [0.488, 2.957]|
| **Gender**                          |                                     |                                  |                    |
| Male                                | 117 (51.45)                         | 5 (71.92)                        |                    |
| Female                              | 110 (48.55)                         | 2 (28.08)                        | 0.414 [0.078, 2.181]|
| **Total monthly family income**     |                                     |                                  |                    |
| Prefer not to answer                | 26 (11.55)                          | 1 (14.36)                        |                    |
| Up to 1000$                         | 110 (48.32)                         | 3 (42.48)                        | 0.707 [0.071, 7.000]|
| 1000–2000$                          | 56 (24.71)                          | 2 (28.8)                         | 0.938 [0.083, 10.633]|
| More than 2000$                     | 35 (15.42)                          | 1 (14.36)                        | 0.840 [0.046, 12.320]|
| **Parental marital status**         |                                     |                                  |                    |
| Not married                         | 23 (10.18)                          | 0 (0)                            | 0 [0, 0]           |
| Married                             | 204 (89.82)                         | 7 (100)                          |                    |
| **Mother’s employment**             |                                     |                                  |                    |
| Unemployed                          | 140 (62.75)                         | 5 (71.24)                        | 1.470 [0.282, 7.677]|
| Employed                            | 83 (37.25)                          | 2 (28.76)                        |                    |
| **Father’s employment**             |                                     |                                  |                    |
| Prefer not to answer                | 210 (92.56)                         | 6 (85.64)                        | 0.479[0.055, 4.163]|
| Mother's education                  |                                     |                                  |                    |
| Elementary or less                  | 33 (14.65)                          | 3 (43.12)                        |                    |
| High school or less                 | 129 (57.36)                         | 2 (28.12)                        | 0.167 [0.027, 1.037]|
| University or more                  | 63 (27.99)                          | 2 (28.76)                        | 0.349 [0.056, 2.168]|
| **Father’s education**              |                                     |                                  |                    |
| Elementary or less                  | 52 (23.19)                          | 2 (28.76)                        |                    |
| High school or less                 | 123 (54.98)                         | 4 (56.88)                        | 0.613 [0.411, 0.915]*|
| University or more                  | 49 (21.84)                          | 1 (14.36)                        | 0.249 [0.132, 0.470]***|
| Mother not living at home           | 12 (5.3)                            | 0 (0)                            | 0 [0, 0]           |
| Father not living at home           | 40 (17.72)                          | 5 (71.24)                        | 1.874 [0.354, 9.912]|
| Total number of individuals living at home | 4.91 (1.79) | 5 (1.50) | 0.938 [0.605, 1.353] |
| **Parental assessment of child’s academic performance at school** | | | |
| Good—passes all classes without any problems | 185 (81.37) | 3 (42.48) | 5.335 [1.040, 27.367]* |
| Acceptable—does well but has occasional difficulties with some subjects | 35 (15.5) | 3 (43.16) | 8.790 [0.818, 94.389] |
| Sub-optimal—fails some subjects or classes | 7 (3.13) | 1 (14.36) | 14.809 [2.967, 73.915] ** |
| Repeated at least one school grade | 11 (4.88) | 3 (43.16) | 14.551 [0.181, 13.276] |
| Ever received home tutoring         | 22 (9.78)                           | 1 (14.4)                         | 1.551 [0.056, 27.367]** |
| Ever received accommodation at school | 15 (6.65) | 0 (0) | 0 [0, 0] |
| chronic physical illness            | 12 (5.41)                           | 3 (42.48)                        | 12.929 [2.601, 64.227]* |
| Positive psychiatric family history | 14 (6.17)                           | 4 (57.14)                        | 20.286 [4.130, 99.638]** |
| Parental GHQ total score            | 20.87(55.56)                        | 30.86 (13.81)                    | 1.079 [1.016, 1.146]* |

*a*Mean (SD)  
*p < 0.05; **p < 0.01; ***p < 0.001

2.158; CI [1.020, 4.565]), having a positive psychiatric family history (OR 3.186; CI [1.401, 7.241]), higher PRQ bully score indicating increased bullying behavior (OR 1.165; CI [1.037, 1.309]), and higher PRQ victim score indicating increased victimization (OR 1.247; CI [1.079, 1.442]) were associated with screening positive for a psychiatric disorder. Higher family income was negatively
Table 4  Correlates of positive screens for psychiatric disorders in 8–11-year-old children

|                           | Screened negative (n=495; 68.37%) | Screened positive (n=229; 31.63%) | Unadjusted OR [CI]       | Adjusted OR [CI]       |
|---------------------------|-----------------------------------|-----------------------------------|--------------------------|------------------------|
| Agea                      | Mean(SD)                          | Mean(SD)                          |                         |                        |
|                           | 9.31 (1.14)                       | 9.28 (1.17)                       | 0.977 [0.852, 1.120]     | 0920 [0.785, 1.078]    |
| Gender                    |                                   |                                   |                          |                        |
| Male                      | 254 (51.33)                       | 114 (49.78)                       |                          |                        |
| Female                    | 241 (48.67)                       | 115 (50.22)                       | 1.064 [0.778, 1.455]     | 1.166 [0.809, 1.679]   |
| Total monthly family income|                                   |                                   |                          |                        |
| Prefer not to answer      | 50 (10.1)                         | 36 (15.76)                        |                          |                        |
| Up to 1000$               | 180 (36.36)                       | 129 (56.29)                       | 0.992 [0.611, 1.610]     | 0.705 [0.410, 1.213]   |
| 1000–2000$                | 204 (41.15)                       | 48 (20.97)                        | 0.327 [0.192, 0.556]**   | 0.402 [0.225,0720]*    |
| More than 2000$           | 61 (12.4)                         | 16 (6.98)                         | 0.361 [0.180, 0.724]*    | 0.381 [0.180, 0.806]*  |
| Parental marital status   |                                   |                                   |                          |                        |
| Not married               | 28 (5.58)                         | 15 (6.48)                         | 1.171 [0.611, 2.247]     |                        |
| Married                   | 467 (94.42)                       | 214 (93.52)                       |                          |                        |
| Mother's employment       |                                   |                                   |                          |                        |
| Unemployed                | 363 (73.37)                       | 164 (72.9)                        |                          |                        |
| Unemployed                | 132 (26.63)                       | 61 (27.1)                         | 0.977 [0.685, 1.393]     |                        |
| Father's employment       |                                   |                                   |                          |                        |
| Employed                  | 463 (93.56)                       | 212 (92.72)                       |                          |                        |
| Prefer not to answer      | 32 (6.44)                         | 17 (7.28)                         | 0.875 [0.474, 1.618]     |                        |
| Mother's education        |                                   |                                   |                          |                        |
| Elementary or less        | 46 (9.31)                         | 37 (16.21)                        |                          |                        |
| High school or less       | 344 (70.33)                       | 156 (68.5)                        | 0.559 [0.348, 0.898]*    |                        |
| University or more        | 100 (20.36)                       | 35 (15.29)                        | 0.431[0.241, 0.770]*     |                        |
| Father's education        |                                   |                                   |                          |                        |
| Elementary or less        | 83 (16.99)                        | 67 (29.46)                        |                          |                        |
| High school or less       | 320 (65.46)                       | 131 (57.71)                       | 0.508 [0.347, 0.744]***  |                        |
| University or more        | 86 (17.55)                        | 29 (12.83)                        | 0.422 [0.248, 0.716]**   |                        |
| Mother not living at home | 15 (2.98)                         | 8 (3.52)                          | 1.189 [0.496, 2.847]     |                        |
| Father not living at home | 50 (10.08)                        | 39 (16.98)                        | 1.825[1.161, 2.869]*     | 1.3455 [0.867,2.441]   |
| Total number of individuals living at homea | 5.00 (1.66) | 5.14 (1.82) | 1.050 [0.959, 1.150] |                        |
| Parental assessment of child's academic performance at school |                           |                                   |                          |                        |
| Good—passes all classes without any problems | 416 (84.06) | 162 (70.92) | 1.815 [1.220, 2.700]* | 1.380 [0.860,2.214] |
| Acceptable—does well but has occasional difficulties with some subjects | 74 (14.98) | 53 (22.93) | 7.541 [2.630, 21.619]*** | 2.594 [0.816, 8.245] |
| Sub-optimal—fails some subjects or classes | 5 (0.97) | 14 (6.14) | 2.797 [1.720, 4.547]*** |                       |
| Repeated at least one school grade | 35 (6.99) | 40 (17.36) | 2.055[1.288, 3.279]* |                       |
| Ever received home tutoring | 43 (8.78) | 38 (16.52) | 2.239 [0.988, 5.070] |                       |
| Ever received accommodation at school | 12 (2.41) | 12 (5.23) | 4.119 [2.408, 7.047]*** | 1.945 [1.052, 3.595]* |
| Chronic physical illness | 24 (4.92) | 40 (17.58) | 5.415 [2.532, 11.580]*** | 1.819 [0.765, 4.323] |
| Positive psychiatric family history | 10 (2.02) | 23 (10.04) | 1.070 [1.052, 1.087]*** | 1.058 [1.038, 1.078]*** |
| GHQ total scorea | 15.47 (9.45) | 23.1 (12.05) | 1.072 [0.979,1.174] |                       |
| PRQ bully scorea | 1.01 (1.59) | 1.21 (1.84) | 1.297 [1.194, 1.410]*** | 1.324 [1.200, 1.460]*** |
| PRQ victim scorea | 1.05 (1.54) | 2.06 (2.47) | 1.297 [1.194, 1.410]*** | 1.324 [1.200, 1.460]*** |

*aMean(SD)

*p < 0.05; **p < 0.01; ***p < 0.001
Table 5  Correlates of positive screens for psychiatric disorders in 12–17-year-old adolescents

|                         | Screened negative | Screened positive | Unadjusted OR [CI] | Adjusted OR [CI] |
|-------------------------|-------------------|-------------------|--------------------|------------------|
| Age                     | 13.91 (1.63)      | 14.46 (1.69)      | 1.218 [1.100, 1.348]*** | 1.203 [1.072, 1.352]* |
| Gender                  |                   |                   |                    |                  |
| Male                    | 155 (52.06)       | 117 (44.75)       |                    | 1.696 [1.143, 2.517]* |
| Female                  | 143 (47.94)       | 144 (55.25)       | 1.341 [0.961, 1.872] |                  |
| Total monthly family income |                |                   |                    |                  |
| Prefer not to answer    | 31 (10.48)        | 33 (12.72)        |                    |                  |
| Up to 1000$             | 106 (35.61)       | 146 (56.02)       | 1.296 [0.749, 2.243] | 0.681 [0.354, 1.309] |
| 1000–2000$              | 127 (42.49)       | 65 (25.08)        | 0.486 [0.274, 0.862]* | 0.478 [0.252, 0.905]* |
| More than 2000$         | 34 (11.42)        | 16 (6.17)         | 0.445 [0.206, 0.959]* | 0.543 [0.230, 1.283] |
| Parental marital status |                   |                   |                    |                  |
| Not married             | 22 (7.4)          | 28 (10.7)         | 1.499 [0.835, 2.690] |                  |
| Married                 | 276 (92.6)        | 233 (89.3)        |                    |                  |
| Mother's employment     |                   |                   |                    |                  |
| Unemployed              | 214 (72.14)       | 198 (76.47)       |                    |                  |
| Employed                | 83 (27.86)        | 61 (23.53)        | 1.225 [0.855, 1.841] |                  |
| Father's employment     |                   |                   |                    |                  |
| Employed                | 264 (88.61)       | 229 (87.82)       |                    |                  |
| Prefer not to answer    | 34 (11.39)        | 32 (12.18)        | 0.927 [0.554, 1.551] |                  |
| Mother's education      |                   |                   |                    |                  |
| Elementary or less      | 32 (10.67)        | 49 (19.09)        |                    |                  |
| High school or less     | 221 (74.66)       | 180 (69.99)       | 0.524 [0.322, 0.854]* |                  |
| University or more      | 43 (14.67)        | 28 (10.92)        | 0.416 [0.217, 0.799]* |                  |
| Father's education      |                   |                   |                    |                  |
| Elementary or less      | 58 (19.48)        | 80 (31.2)         |                    |                  |
| High school or less     | 186 (62.87)       | 157 (61.76)       | 0.613 [0.411, 0.915]* | 1.113 [0.685, 1.874] |
| University or more      | 52 (17.65)        | 18 (7.04)         | 0.249 [0.132, 0.470]*** | 0.611 [0.278, 1.344] |
| Mother not living at home | 2 (0.65)    | 8 (3.06)          | 0.4815 [0.995, 2.291] |                  |
| Father not living at home | 40 (13.47) | 46 (17.62)        | 1.373 [0.867, 2.176] |                  |
| Total number of individuals living at homea | 5.20 (1.73) | 5.28 (1.98) | 1.023 [0.935, 1.119] |                  |
| Parental assessment of child's academic performance at school |                   |                   |                    |                  |
| Good—passes all classes without any problems | 240 (80.42) | 157 (60.13) | 2.320 [1.552, 3.468]*** | 1.452 [0.872, 2.417] |
| Acceptable—does well but has occasional difficulties with some subjects | 53 (17.64) | 80 (30.6) | 2.320 [1.552, 3.468]*** | 1.452 [0.872, 2.417] |
| Sub-optimal—fails some subjects or classes | 6 (1.94) | 24 (9.27) | 6.408 [2.529, 16.237]*** | 2.990 [1.043, 8.568]* |
| Repeated at least one school grade | 56 (18.61) | 100 (38.3) | 2.715 [1.849, 3.985]*** | 1.645 [0.988, 2.739] |
| Ever received home tutoring | 30 (10)  | 41 (15.56) | 1.658 [1.001, 2.748]* |                  |
| Ever received accommodation at school | 6 (1.99) | 12 (4.65) | 2.396 [0.885, 6.485] |                  |
| chronic physical illness | 13 (4.4) | 33 (12.58) | 3.127 [1.605, 6.090]*** | 2.158 [1.020, 4.565]* |
| Positive psychiatric family history | 9 (3.02) | 39 (14.94) | 5.641 [2.676, 11.890]*** | 3.186 [1.401, 7.241]* |
| GHQ total scorea | 19.42 (8.63) | 21.91 (9.99) | 1.029 [1.011, 1.048]* |                  |
| PRQ bully scorea | 0.77 (1.47) | 1.151 (1.99) | 1.295 [1.164, 1.440]*** | 1.165 [1.037, 1.309]* |
| PRQ victim scorea | 0.52 (1.12) | 1.17 (2.47) | 1.360 [1.195, 1.547]*** | 1.247 [1.079, 1.442]* |
| Child reported CBQ score pertaining to fathera | 8.64 (1.84) | 8.48 (2.68) | 0.968 [0.899, 1.041] |                  |
| Child reported CBQ score pertaining to mothera | 9.12 (1.99) | 9.41 (2.05) | 1.073 [0.988, 1.166] |                  |
| CBQ parent scorea | 3.99 (3.89) | 5.30 (4.63) | 1.075 [1.033, 1.119]*** | 1.037 [0.990, 1.087] |

*Mean(SD)

*p < 0.05; **p < 0.01; ***p < 0.001
associated with screening positive for a psychiatric disorder (OR 0.478; CI [0.252, 0.905]) (Table 5).

Discussion

The Psychopathology in Children and Adolescents in Lebanon Study (PALS) is the first study to screen for psychiatric disorders among children and adolescents in a representative national sample in Lebanon. Our data show that 1 in 3 Lebanese children and adolescents screened positive for at least one psychiatric disorder. The fact that we used multiple screening tools (most other studies relied solely on the SDQ) and used both parent and child reports may have contributed to the higher estimate.

Studies have shown that almost 50% of the difference in the prevalence of conduct disorder among children can be attributed to environmental factors [40]. Prenatal and perinatal interventions thus can play a role in the prevention of conduct disorder. Our prevalence of ADHD symptoms is also similar to published data that used the SDQ in other countries [41–44]. Identifying children and adolescents with or at risk for conduct disorder and/or ADHD is of public health importance, since the former is associated with increased risk of substance abuse and criminal activity and the latter is associated with academic difficulty and increased risk for other psychiatric disorders.

Alarmingly, almost 1 in 5 (18%) of adolescents smoked cigarettes, drank alcohol, or used water pipe in the past 30 days in our study, in line with the most recent data (2017) from the Lebanon Global School-based Health Survey (GSHS) that reported a 30-day prevalence among 7th–12th graders of 35% for any tobacco product, and 18% for alcohol [45]. Data on alcohol and tobacco use among children and adolescents clearly indicate the need for stronger implementation of substance use policies, including effective regulation of availability, marketing (of alcohol), and minimum pricing of both alcohol and tobacco products [46].

Our results showed a negative association between higher family income and child mental health, consistently across all studied age groups, in line with previous research [47]. Given the cross-sectional nature of our study, we cannot ascertain whether the association observed is due to social causation or social drift or both [48, 49]. However, longitudinal studies have confirmed that children with low (vs. high) SES have higher parent-reported mental health problems and higher rates of unmet mental health needs [50], with extended exposure to poverty associated with worse outcomes [51]. These findings stress on the need to prioritize families of lower SES in governmental and non-governmental mental health initiatives and resource allocation.

Worse academic performance was also associated with higher odds of screening positive for a mental health disorder, corroborating findings from other published studies [25, 52, 53] with longitudinal studies showing a bidirectional effect [54]. Partnerships between mental health and educational systems to screen children with academic difficulties are vital to properly detect and address any possible mental health problems early on [55].

Having a chronic physical illness was associated with higher odds of screening for a psychiatric disorder across all age groups, similar to what we had found in the previous Beirut prevalence study [12]. This may be due to feelings of inadequacy or lack of control associated with the chronic illness, restrictions in positive activities, medication side
effects [56], and increased levels of peer victimization [57]. Such a finding calls for enhanced mental health screening practices in pediatric and primary healthcare facilities, particularly in children with chronic physical health issues.

Poorer parental mental health was associated with higher risk for an offspring to screen positive for a mental health disorder. Interestingly, this finding was significant in the 5–11 years age groups but not in adolescents highlighting the role of parental psychopathology in early onset psychiatric symptoms. Studies have consistently shown that children of mentally ill parents are more likely to develop internalizing and externalizing disorders [58, 59]. In addition to genetic factors [60], this may be due to difficulties in parent–child interactions leading to decreased monitoring, decreased family cohesion, and greater conflict [61]. Indeed, we also found that higher parent-reported conflict with the child was also associated with increased odds for screening positive for a psychiatric disorder. Parent–child conflict is known to be associated with behavioral and emotional problems [62, 63] and interventions that address this conflict may help mitigate the risk for psychopathology in the offspring.

Higher levels of peer victimization were associated with higher odds of risk for a psychiatric disorder highlighting the deleterious psychological effects of bullying which may extend well into adulthood [64, 65]. It is important to note, however, that many other factors come into play to moderate the deleterious effects of bullying. As such, addressing bullying as a public health concern may help mitigate its short- and long-term effects on mental health, suicidality, and criminality [65].

Only 5% of children who screened positive for a psychiatric disorder ever sought mental health help. Alarmingly, we had shown a similar treatment gap several years ago [12]. This trend continues to be much lower than the rate seen in developing countries [34, 66, 67], and may be due to lack of awareness or stigma surrounding mental health that is prevalent in the Arab world [6, 68]. Other probable barriers to treatment seeking may include lack of accessibility and affordability, since Lebanon relies predominantly on the private sector to provide mental health services. The fragmentation within the healthcare system also leads to disparities in mental health coverage across seven different financing intermediaries; creating both inefficiency and inequality [69]. Fortunately, since 2015, Lebanon has had a national mental health strategy reforming several mental health care-related issues including governance and increased access to care for all residents of Lebanon.

Our study has a number of limitations. First, the absence of a census since 1932 and therefore an accurate sampling frame for Lebanon may have affected the representativeness of the sample. Furthermore, our response rate of 47%, similar to the response rate of 51% obtained in a previous study conducted by our team in the Greater Beirut area [12], is also lower than that observed in other international studies [70, 71], which may have introduced selection bias. Studies have shown that non-respondents in mental health surveys are usually individuals with more psychological distress or psychiatric disorders [72, 73]. One study that examined the extent to which prevalence estimates of adolescent health-related behaviors would be affected by sampling bias found that the resulting proportions would be underestimated almost by fourfold [74]. Together, these published findings on the impact of selection bias in mental health surveys indicate that it is highly likely that the percentage of children and adolescents who screened positive is biased toward the null. Nonetheless, it is important to note that the distribution of the basic demographic characteristics in our sample (gender, socioeconomic status, and percentage of fathers not living at home) was all comparable to 2018–2019 data published by the Central Administration of Statistics (CAS), a governmental body that disseminates national statistics to the public [23]. Another methodological limitation was the use of screening tools rather than diagnostic interviews, but we made sure to employ Arabic validated tools to maximize construct validity. While the Arabic versions of the Mood and Feelings Questionnaires (MFQ) and the Screen for Childhood Anxiety Related Disorders (SCARED) were previously validated by our team and showed good internal consistency and cut-off scores that differentiated depressed vs non-depressed groups (for the MFQ) and anxious vs non-anxious (for the SCARED) were established, the cut-off scores for the SDQ and CRIES 8 were not validated within the Lebanese community. This may have led to an underestimation or overestimation of the true prevalence of psychiatric disorders as measured by these two instruments. This highlights the need for greater efforts to cross culturally validate psychiatric instruments to guide child mental health research, especially in low- and middle-income countries [75].

Another limitation is the fact that we did not screen for childhood adversities. These have been repeatedly established as a risk factor for psychopathology in children and adolescents [76], and adults [77]. When cumulative, childhood adversities are more strongly associated with psychopathology [78]. While not all children exposed to adversities develop psychopathology, studies have found that parent–child conflict mediates this relationship [79]. While in our study, we used CRIES 8 which is an indirect indicator of recent trauma exposure, it is important for future research to include more comprehensive metrics on childhood adversities.

Despite these limitations, “PALS” remains the most comprehensive and only national study to date to assess the prevalence of mental health problems among youth in Lebanon, a country that has been hit by a series of calamities in the recent past. In fact, the percentage of youth affected
by mental health problems is likely to have increased given
the most recent near-collapse of the Lebanese economy,
the COVID-19 pandemic, and the most recent Beirut port
explosion [80, 81]. Our findings clearly highlight the need
for a concerted national effort to mitigate the impact of these
recent and ongoing events on the mental health of children
and adolescents. Efforts should employ all stakeholders
including but not limited to the various ministries, non-
governmental organizations working with youth, schools,
public health and mental health professionals, and primary
care physicians to work together to identify children and
adolescents at risk for psychiatric disorders, develop
preventive interventions, and improve access to care. Youth
and their parents must be engaged in the process as the
participatory-based approaches to finding solutions will
allow for their success and sustainability.

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ception of the project. Dr. LA conducted the statistical analysis. Drs.
LA, FTM and LAG wrote the manuscript. All authors reviewed and
edited the manuscript.

Declarations

Conflict of interest Dr. Maalouf reports the following: advisory board
member of Ayadi Health, and research grant from the Harvard Medical
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References

1. GHDx (n.d.) Global Burden of Disease Study 2016 (GBD 2016)
data resources. http://ghdx.healthdata.org/gbd-2016. Retrieved 10
Oct 2019
2. Kessler RC et al (2005) Lifetime prevalence and age-of-onset
distributions of DSM-IV disorders in the national comorbidity
survey replication. JAMA Psychiat 62(6):593–602
3. Costello EJ et al (2003) Prevalence and development of psychiatric
disorders in children and adolescents. Arch Gen Psychiatry
60(8):837–844
4. Orvaschel H, Lewinsohn PM, Seeley JR (1995) Continuity of
psychopathology in a community sample of adolescents. J Am
Acad Child Adolesc Psychiatry 34(11):1525–1535
5. Erskine HE et al (2017) The global coverage of prevalence data for
mental disorders in children and adolescents. Epidemiol Psychiatric
Sci 26(4):395–402
6. Maalouf FT, Alamiri B, Atweh S, Becker AE, Cheour M,
Darwish H, Ghandour LA, Guloum S, Hamze M, Karam
E, Khoury B, Khoury SJ, Mokdad A, Mehio LI, Okasha T,
Reed GM, Shtaity E, Zeinoun P, Akl EA (2019) Mental health
research in the Arab region: challenges and call for action.
Lancet Psychiatry 6(11):961–966. https://doi.org/10.1016/S2215-0366(19)30124-5
7. Okasha A, Karam E, Okasha T (2012) Mental health services in
the Arab world. World Psychiatry 11(1):52–54
8. Attanayake V et al (2009) Prevalence of mental disorders among
children exposed to war: a systematic review of 7,920 children.
Med Confl Surviv 25(1):4–19
9. Zolezzi M et al (2018) Stigma associated with mental illness and
its treatment in the Arab culture: a systematic review. Int J Soc
Psychiatry 64(6):597–609
10. Richa S et al (2014) ADHD prevalence in Lebanese school-age
population. J Atten Disord 18(3):242–246
11. Usta I, Farver J, Danachi D (2013) Child maltreatment: the
Lebanese children’s experiences. Child Care Health Dev
39(2):228–236
12. Maalouf FT et al (2016) Psychiatric disorders among adolescents
from Lebanon: prevalence, correlates, and treatment gap. Soc
Psychiatr Psychiatr Epidemiol 51(8):1105–1116
13. MOPH (n.d.) The statistical bulletin of the Ministry of Public
Health. Ministry of Public Health. https://www.moph.gov.lb/en/Pages/8327/statistical-bulletins. Retrieved 9 Jan 2020
14. Almasrahi MH, Shuwal Ay (2004) Validity of the self-report
version of the strengths and difficulties questionnaire in Yemen.
Saudi Med J 25(5):592–601
15. Goodman R et al (2003) Using the Strengths and Difficulties
Questionnaire (SDQ) to screen for child psychiatric disorders in
a community sample. Int Rev Psychiatry 15(1–2):166–172
16. Tavitian L et al (2014) The Arabic Mood and Feelings
Questionnaire: psychometrics and validity in a clinical sample.
Child Psychiatry Hum Dev 45(3):361–368
17. Hariz N et al (2013) Reliability and validity of the Arabic Screen
for Child Anxiety Related Emotional Disorders (SCARED) in a
clinical sample. Psychiatry Res 209(2):222–228
18. Panter-Brick C et al (2015) Trauma memories, mental health, and
resilience: a prospective study of Afghan youth. J Child Psychol
Psychiatry 56(7):814–825
19. Perrin S, Meiser-Stedman R, Smith P (2005) The Children’s
Revised Impact of Event Scale (CRIES): validity as a screening
instrument for PTSD. Behav Cogn Psychother 33(4):487–498
20. Safari R et al (2017) Screening for PTSD symptoms in
unaccompanied refugee minors: a test of the CRIES-8
questionnaire in routine care. Scand J Public Health
45(6):605–611
21. Halabi F et al (2018) Correlates of bullying and its relationship
with psychiatric disorders in Lebanese adolescents. Psychiatry
Res 261:94–101
22. Goldberg DP et al (1997) The validity of two versions of the GHQ
in the WHO study of mental illness in general health care. Psychol
Med 27(1):191–197
23. Central Administration of Statistics. (n.d.). Demographic and
social statistics. Central Administration of Statistics. http://www.
cas.gov.lb/index.php/demographic-and-social-en. Retrieved 14
May 2020
24. Kieling C et al (2011) Child and adolescent mental health
worldwide: evidence for action. Lancet 378(9801):1515–1525
25. Burnett-Ziegler I et al (2012) Prevalence and correlates of mental
health problems and treatment among adolescents seen in primary
care. J Adolesc Health 50(6):559–564
26. AL-MOdayer OAYA (2015) A pilot study on the prevalence of
psychiatric disorders among Saudi children and adolescents: a
sample from a selected community in Riyadh City. Arab J
Psychiatry 44(2151):1–10
27. Ravens-Sieberer U et al (2008) Prevalence of mental health
problems among children and adolescents in Germany: results of
the BELLA study within the National Health Interview and
Examination Survey. Eur Child Adolesc Psychiatry 17(Suppl 1):22–33

Ma J et al (2021) Parent reports of children’s emotional and behavioral problems in a low- and middle-income country (LMIC): an epidemiological study of Nepali schoolchildren. PLoS ONE 16(8):e0255596

Thabet AM (2019) The relationship between mental health of Palestinian mothers due to siege and child attachment. Arab J Psychiatry 30(1):8–17

Freh FM (2016) PTSD, depression, and anxiety among young people in Iraq one decade after the American invasion. Traumatology 22(1):56–62

Wittechen H-U, Nelson CB, Lachner G (1998) Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. Psychol Med 28(1):109–126

Thabet AA, Vostanis P (2000) Post-traumatic stress disorder reactions in children of war: a longitudinal study. Child Abuse Negl 24(2):291–298

Davis L, Siegel LJ (2000) Posttraumatic stress disorder in children and adolescents: a review and analysis. Clin Child Fam Psychol Rev 3(3):135–154

Perrin S, Meiser-Stedman R, Smith P (2005) The Children’s Revised Impact of Event Scale (CRIES): validity as a screening instrument for PTSD. Behav Cogn Psychother 33:487–498

Newbury JB et al (2018) Measuring childhood maltreatment to predict early-adult psychopathology: comparison of prospective informant-reports and retrospective self-reports. J Psychiatr Res 96:57–64

Brietzke E et al (2012) Impact of childhood stress on psychopathology. Braz J Psychiatry 34:480–488

Kassam-Adams N (2014) Design, delivery, and evaluation of early interventions for children exposed to acute trauma. Eur J Psychotraumatol 5(1):22757

Salmanian M, Asadian-Koohestani F, Mohammadi MR (2017) A systematic review on the prevalence of conduct disorder in the Middle East. Soc Psychiatry Psychiatr Epidemiol 52(11):1337–1343

Polanczyk GV et al (2015) Annual research review: a meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. J Child Psychol Psychiatry 56(3):345–365

Fairchild G et al (2019) Conduct disorder. Nat Rev Dis Primers 5(1):43

Elberling H et al (2010) The prevalence of SDQ-measured mental health problems at age 5–7 years and identification of predictors from birth to preschool age in a Danish birth cohort: the Copenhagen Child Cohort 2000. Eur Child Adolesc Psychiatry 19(9):725–735

Koskelainen M, Sourander A, Kaljonen A (2000) The Strengths and Difficulties Questionnaire among Finnish school-aged children and adolescents. Eur Child Adolesc Psychiatry 9(4):277–284

Schlack R et al (2007) The prevalence of attention-deficit/hyperactivity disorder (ADHD) among children and adolescents in Germany. Initial results from the German Health Interview and Examination Survey for Children and Adolescents (KiGGS). Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz 50(5–6):827–835

Woerner W et al (2004) The Strengths and Difficulties Questionnaire overseas: evaluations and applications of the SDQ beyond Europe. Eur Child Adolesc Psychiatry 13(2):47–54

Global School-Based Student Health Survey Report Lebanon (n.d.). https://www.moph.gov.lb/userfiles/files/GSHS_Report_2017.pdf. Retrieved 10 Sept 2019

Ghandour L et al (2016) Alcohol consumption in the Arab region: what do we know, why does it matter, and what are the policy implications for youth harm reduction? Int J Drug Policy 28:10–33

Reiss F (2013) Socioeconomic inequalities and mental health problems in children and adolescents: a systematic review. Soc Sci Med 90:24–31

Hudson CG (2005) Socioeconomic status and mental illness: tests of the social causation and selection hypotheses. Am J Orthopsychiatry 75(1):3–18

Lund C, Cois A (2018) Simultaneous social causation and social drift: longitudinal analysis of depression and poverty in South Africa. J Affect Disord 229:396–402

Wadsworth ME, Achenbach TM (2005) Explaining the link between low socioeconomic status and psychopathology: testing two mechanisms of the social causation hypothesis. J Consult Clin Psychol 73(6):1146

Ratcliffe C, McKernan S-M (2010) Childhood poverty persistence: facts and consequences. Urban Institute, Washington, DC

Fernández-Castillo A, Gutiérrez Rojas ME (2009) Selective attention, anxiety, depressive symptomatology and academic performance in adolescents

Graziano PA et al (2007) The role of emotion regulation in children’s early academic success. J Sch Psychol 45(1):3–19

Deighton J et al (2018) Longitudinal pathways between mental health difficulties and academic performance during middle childhood and early adolescence. Br J Dev Psychol 36(1):110–126

Lane KL et al (2017) Building strong partnerships: education and mental health systems working together to advance behavioral health screening in schools. Rep Emot Behav Disord Youth 17(4):93–101

Pinquart M, Shen Y (2011) Behavior problems in children and adolescents with chronic physical illness: a meta-analysis. J Pediatr Psychol 36(9):1003–1016

Pinquart M (2016) Systematic review: bullying involvement of children with and without chronic physical illness and/or physical/sensory disability—a meta-analytic comparison with healthy/non-disabled peers. J Pediatr Psychol 42(3):245–259

Beidel DC, Turner SM (1997) At risk for anxiety: I. Psychopathology in the offspring of anxious parents. J Am Acad Child Adolesc Psychiatry 36(7):918–924

Weissman MM et al (2006) Offspring of depressed parents: 20 years later. Am J Psychiatry 163(6):1001–1008

Tsuang MT et al (2004) Gene–environment interactions in mental disorders. World Psychiatry 3(2):73

Van Loon LMA et al (2014) The relation between parental mental illness and adolescent mental health: the role of family factors. J Child Fam Stud 23(7):1201–1214

Marmorstein NR, Iacono WG (2004) Major depression and conduct disorder in youth: associations with parental psychopathology and parent–child conflict. J Child Psychol Psychiatry 45(2):377–386

Schwartz OS et al (2012) Parental behaviors during family interactions predict changes in depression and anxiety symptoms during adolescence. J Abnorm Child Psychol 40(1):59–71

Arseneault L (2017) The long-term impact of bullying victimization on mental health. World Psychiatry 16(1):27–28

Klmek AB, Sourander A, Eloneimho H (2015) Bullying by peers in childhood and effects on psychopathology, suicidality, and criminality in adulthood. Lancet Psychiatry 2(10):930–941

Costello EJ et al (2014) Services for adolescents with psychiatric disorders: 12-month data from the National Comorbidity Survey-Adolescent. Psychol Serv 65(3):359–366

Weinberger D, Peterson MD (2019) US national and state-level prevalence of mental health disorders and disparities of mental health care use in children. JAMA Pediatr 173(4):389–391

Al-Krenawi A (2005) Mental health practice in Arab countries. Curr Opin Psychiatry 18(5):560–564

Social Psychiatry and Psychiatric Epidemiology (2022) 57:761–774
69. Yehia F, Nahas Z, Saleh S (2014) A roadmap to parity in mental health financing: the case of Lebanon. J Ment Health Policy Econ 17(3):131–141
70. Kessler RC et al (2009) National comorbidity survey replication adolescent supplement (NCS-A): II. Overview and design. J Am Acad Child Adolesc Psychiatry 48(4):380–385
71. Hafekost J et al (2016) Methodology of young minds matter: the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Aust N Z J Psychiatry 50(9):866–875
72. Horikoshi N et al (2017) The characteristics of non-respondents and respondents of a mental health survey among evacuees in a disaster: the Fukushima Health Management Survey. Fukushima J Med Sci 63(3):152–159
73. Haapea M et al (2007) Non-participation may bias the results of a psychiatric survey: an analysis from the survey including magnetic resonance imaging within the Northern Finland 1966 Birth Cohort. Soc Psychiatry Psychiatr Epidemiol 42(5):403–409
74. Cheung KL et al (2017) The impact of non-response bias due to sampling in public health studies: a comparison of voluntary versus mandatory recruitment in a Dutch national survey on adolescent health. BMC Public Health 17(1):276
75. Patel V et al (2008) Promoting child and adolescent mental health in low and middle income countries. J Child Psychol Psychiatry 49(3):313–334
76. Green JG et al (2010) Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: associations with first onset of DSM-IV disorders. Arch Gen Psychiatry 67(2):113–123
77. Kessler RC, Davis CG, Kendler KS (1997) Childhood adversity and adult psychiatric disorder in the US national comorbidity survey. Psychol Med 27:1101–1119
78. Costello EJ, Erkanli A, Fairbank JA, Angold A (2002) The prevalence of potentially traumatic events in childhood and adolescence. J Trauma Stress 15(2):99–112
79. Dhondt N, Healy C, Clarke M, Cannon M (2019) Childhood adversity and adolescent psychopathology: evidence for mediation in a national longitudinal cohort study. Br J Psychiatry 215(3):559–564
80. Blanchet K, Fouad FM, Pherali T (2016) Syrian refugees in Lebanon: the search for universal health coverage. Confl Heal 10(1):12
81. Liu JJ et al (2020) Mental health considerations for children quarantined because of COVID-19. TLancet Child Adolesc Health 4(5):347–349

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