

Psychiatric disorders among adolescents from Lebanon: prevalence, correlates, and treatment gap

Fadi T. Maalouf¹ · Lillian A. Ghandour² · Fadi Halabi¹ · Pia Zeinoun¹ ·
Al Amira Safa Shehab⁴ · Lucy Tavitian³

Received: 30 September 2015 / Accepted: 12 May 2016 / Published online: 31 May 2016
© Springer-Verlag Berlin Heidelberg 2016

Abstract

Purpose Adolescence is a critical age for the development of psychiatric disorders. Although Lebanon, a low-to-middle income country, has suffered from decades of war and political instability, the burden of psychiatric disorders among adolescents in Lebanon remains unclear. This study aims to estimate the prevalence of psychiatric disorders among adolescents in the Lebanese capital, Beirut, and to study the correlates and treatment seeking behavior associated with these disorders.

Methods Through a multistage cluster sampling design, 510 adolescents, aged 11–17 years were recruited from a household sample in Beirut in 2012. Parents and adolescents completed a battery of self-reported questionnaires and interviews including the *Development and Well-being Assessment* (DAWBA), the *Peer-Relations Questionnaire* (PRQ), and a demographic/clinical information questionnaire. Logistic regression models were used to study the correlates of psychiatric disorders.

Results The 30-day prevalence of psychiatric disorders was 26.1 %, with anxiety disorders (13.1 %) and ADHD

(10.2 %) being the most prevalent disorders. Only 6 % of those with disorders reported seeking professional help. Parental marital status, not attending school, having a chronic medical condition, having a family history of psychiatric disorders, as well as propensity to bullying and to being victimized by peers emerged as correlates of having psychiatric disorders.

Conclusions A clear treatment gap is evident with a high 30-day prevalence of psychiatric disorders among adolescents in Beirut coupled with a very low percentage seeking treatment. Scaling up mental health services and addressing potential barriers to seeking care would be important to close this gap.

Keywords Adolescence · Mental health · Lebanon · Epidemiology · Arab world

Introduction

Mental health surveys [1–3] point toward an early age of onset of psychiatric disorders, with a substantial percentage of people developing at least one psychiatric disorder before late adolescence [3, 4]. Such data draw attention to adolescence as a critical period for the early detection of mental illness and early intervention.

A recent meta-analysis of 41 studies from 27 different countries reported a pooled worldwide prevalence of 13.4 % for mental disorders in children and adolescents [5]. Only two reports in that meta-analysis were from Arabic speaking Middle-Eastern countries. Indeed, the response to the growing burden of mental disorders in Arab countries has fallen short as evident by insufficient mental health infrastructure and services [6, 7]. Implemented policies and services in the Eastern Mediterranean region

✉ Fadi T. Maalouf
fm38@aub.edu.lb

¹ Child and Adolescent Psychiatry Program, Department of Psychiatry, Faculty of Medicine, American University of Beirut Medical Center, Riad El Solh, PO Box 11-0236, Beirut 11072020, Lebanon

² Department of Epidemiology and Population Health, Faculty of Health Sciences, American University of Beirut, Beirut, Lebanon

³ Department of Cross-Cultural Studies, Tilburg University, Tilburg, The Netherlands

⁴ Department of Psychology, Queens College, City University of New York, New York, USA

specific to child and adolescent mental health are particularly suboptimal [7]. The paucity of large-scale systematic epidemiological regional data may have contributed to this shortage. The few studies that have been conducted, however, found a prevalence of psychiatric disorders in Arab youths that is comparable to worldwide data [8–11].

Although these studies relied on large representative samples and employed sound methodology, they were all limited to the Arab Gulf region which is characterized by a relative financial and political stability as well as unique cultural values and lifestyle patterns distinct from other neighboring Arab countries, such as Lebanon. In addition, Lebanon has undergone decades of war and insecurity. In fact, Lebanon underwent a long demolishing civil war between 1975 and 1990 followed by multiple regional and internal armed conflicts as well as a long series of bombings in its capital Beirut. This exposure to war and violence is known to lead to distress or even mental illness among some children and adolescents [12].

Despite strong evidence for a high burden of psychiatric disorders and a substantial treatment gap among adults in Lebanon [13, 14], prevalence estimates among the general population of children and adolescents are still lacking. Available population surveys in this age group in Lebanon have been limited so far to studying specific disorders [15, 16] and children in specific settings [17]. Reporting on data from the Global School-based Student Health Survey (GSHS) collected in 2005, Mahfoud et al. found the prevalence of suicidal ideation to be at 16 % [16]. Through a nationwide study that relied on a teacher-completed rating scale, the prevalence of attention deficit/hyperactivity disorder (ADHD) was reported to be 3 %. The present study, the Beirut epidemiological investigation of the psychiatric status of youth (BEI-PSY), was conducted in an attempt to generate the first general population-based survey estimates on the prevalence, correlates, and treatment seeking behavior related to psychiatric disorders among adolescents in the Lebanese capital, Beirut.

Methods

Sampling and data collection

BEI-PSY recruited Arabic speaking adolescents, aged 11–17 years and 11 months, living in Beirut between March 2012 and December 2012. Participants were recruited using a multistage cluster sampling technique whereby neighborhoods, streets, and then households (HH) were sampled from the different segment areas within Beirut. Neighborhoods were purposefully chosen by a contracted private research company in Beirut, based on their experience, to represent the different socioeconomic

statuses within these areas. Since Lebanon lacks consistent street naming, an important landmark was identified within each neighborhood and streets in all four directions around the landmark were sampled. These landmarks included churches, mosques, schools, and other locations that deemed important within each neighborhood. If more than one landmark was identified within each neighborhood, only one was selected randomly. Household sampling was systematic and proportionate to the population within segment areas, according to the estimates provided by the Central Administration of Statistics (CAS) in 2004 [18]. Since estimates of households were not available for neighborhoods and streets, the number of households to be sampled was divided equally among neighborhoods, and then among streets, within each segment area. At the level of streets, and in the absence of a sampling frame for available households, household sampling continued until the target number of households from a given street was obtained. Data collectors surveyed an equal number of HH on each street, starting on opposing ends and sides of the street. Sampling of participants on each street ceased when the targeted number had been reached. When the data collector completed their end of the street before reaching their target number of HH knocks, they walked back in the opposite direction knocking on the floors the other surveyor had left out (i.e., knocking on odd floors in case previous surveyor knocked on even floors). We here assumed that any household on a street is representative of that street. Households with at least one adolescent who spoke Arabic were eligible to participate. Within eligible households, one adolescent along with his/her parent/legal guardian were selected. For households with more than one eligible adolescent, only one was randomly chosen. When the chosen adolescent was unavailable or the household could not be reached, the household was revisited only once. Data collection was done after school hours and on weekends.

After extensive training, monitoring, and assessment by our research team, 22 data collectors were ultimately employed. A total of 9061 households were approached. Of those, 3517 households were identified as ineligible and 4540 were of unknown eligibility [No one answered the door (59 %), only the helper was present (16 %), field workers could not access the building (12 %), refusal before establishing eligibility (9 %), parents not available (3 %), or field worker could not tell if the household was eligible for another reason (1 %)]. A total of 1004 households were eligible for participation. Of those, 51.0 % completed the interviews leaving a total sample of 510, 363 refused to participate, and the remaining were either break-offs or cases where the randomly selected child was unavailable in both visits. Across the different segment areas, response rates varied in range between 44 and 71 %

in seven out of eight of the areas, within one area (Zkak El Blat) having an exceptionally low rate at 16 %.

Instruments and measures

The selected adolescent and one of the parents/legal guardians were separately interviewed using the *Development and Well-Being Assessment* (DAWBA) [19]. Clinical diagnoses were generated based on the DAWBA by a child and adolescent psychiatrist (FM) and a licensed masters-level psychologist (PZ). Additionally, the adolescents completed the *Peer-Relations Questionnaire* (PRQ) [20].

Development and well-being assessment (DAWBA)

The DAWBA is a package of interviews and questionnaires used to generate psychiatric diagnoses in children and adolescents based on the *Diagnostic and Statistical Manual—4th edition* (DSM-IV) and the *International Classification of Disease-10* (ICD-10). Diagnostic predictions are generated by the DAWBA based on input from multiple informants. The information, including open-ended questions, is then reviewed by a mental health professional to verify or overrule the generated diagnoses.

For this study, an Arabic version of the DAWBA that had been validated for the use in Yemeni children aged 5–12 years [21] was revised to improve cultural and linguistic applicability to the Lebanese sample, and was updated to expand clinical breadth to bipolar disorder, substance use, eating disorder, and psychosis. The revised Arabic version of the DAWBA was validated in a Lebanese clinical sample of children and adolescents and showed excellent inter-rater reliabilities for disruptive and mood disorders ($\kappa = 0.93$ and 0.82 , respectively), and good inter-rater reliability for anxiety disorders ($\kappa = 0.72$) between the raters who generated diagnoses for BEI-PSY [22].

The recruited adolescent and one parent were interviewed separately. Adolescents were also asked to complete the “Substance Use” section of the DAWBA alone, without being interviewed by the field worker. A few cases (3 %) were judged to be challenging for rating by at least one rater and were accordingly discussed between the two raters until a consensus was reached. Diagnoses were grouped and analyzed as follows: “Emotional Disorders” included Mood Disorders and Anxiety Disorders with the latter including Post-Traumatic Stress Disorder and Obsessive Compulsive Disorder; “Externalizing Disorders” included Attention Deficit/Hyperactivity Disorder and Conduct Disorders (Conduct Disorder & Oppositional Defiant Disorder); “Others” included Tic Disorder, Pervasive Developmental Disorder, Eating Disorder,

Psychotic Disorder, Stereotypic Movement Disorder, and “others”.

Peer-relations questionnaire

This 12-item scale produces three sub-scores: bullying (PRQ-Bully), being victimized (PRQ-Victim), and prosocial behavior (PRQ-Prosocal). Response options include a 4-point Likert scale from 1 = Never to 4 = Very Often. It was translated to Arabic by the study team and back-translated by a psychologist and then the final Arabic version was adjusted accordingly. The version used in this study showed good internal consistency in this sample [“PRQ-Victim” ($\alpha = 0.74$) and “PRQ-Bullies” ($\alpha = 0.70$)].

Demographic and clinical information

Basic demographic information was collected from the parent and included information about the family structure, the parents’ educational level and income; the adolescent’s education; the adolescent’s general medical health; and family psychiatric history.

Treatment seeking behavior

As part of the data collection sheet provided, questions on treatment seeking behavior were collected from the parents. These questions included whether the adolescent ever expressed interest in seeking treatment, whether the parents ever considered that their child needed treatment, whether treatment was ever sought, whether the adolescent was receiving treatment at the time of interview, and who provided that treatment.

Ethical considerations and quality control

The study was approved by the Institutional Review Board (IRB) at the American University of Beirut, and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consents from participating parents/legal guardians and assents from adolescents were obtained. Prior to initiating the study, data collectors were trained by the study team on the interview approach and administration of the instruments. Participants were given a stationery kit at the end of their participation.

Three pilots were conducted before initiating the study during which data collectors were supervised and evaluated before deciding on the final pool of field workers. Quality control was performed separately by the research company and the study team through random call-backs of 10 % of

recruited households that assessed accuracy of the information collected.

Data analysis

Analysis was conducted using the *Statistical Package for the Social Sciences* (SPSS) (version 22.0). Chi-square tests, Student's *t* test, and Pearson's correlations were used to explore correlations between the different demographic variables. Less than 1 % missing values were present for each of the variables included in the analyses, and thus, list-wise deletion was performed for all further analyses. Logistic regression models were run to examine demographic correlates of any psychiatric disorder, as well as any emotional and any externalizing disorder, separately. This analysis was done on three levels. First, bivariate analyses were run followed by multivariable logistic regression analyses whereby associations were adjusted for age and gender. At the final level, multivariable analyses were run including all variables correlated with the outcome at the bivariate level at $p \leq 0.100$ (entered in the second block) in addition to gender and age in years (entered in the first block). For correlates with high association with one another, we only selected the more semantically meaningful variable to include in the final multivariable logistic regression. The threshold for statistical significance was set at $\alpha = 0.05$ based on two-tailed tests.

Results

Sociodemographic characteristics of the sample

Table 1 summarizes the sociodemographic characteristics of the sample. The sample included slightly more males (56 %), with an average age of 13.94 (SD 2.14 years); about a third of the sample was found in each age group [early (11–12 years), mid (13–15 years), and late (16–17 years) adolescence], with no observed gender differences across these age groups. The vast majority (90 %) was Lebanese and about half of the participants came from households in which the father's highest level of education was a secondary school degree or more.

Prevalence of psychiatric disorders and treatment seeking behavior in the sample

About one in four adolescents (26.1 %) were diagnosed with at least one psychiatric disorder. Of those, 54.1 % had only one disorder, 30.8 % had two and 15.1 % had three or more diagnoses. Thirty-four participants 34 (6.7 %) had mood disorders, 67 (13.1 %) had anxiety disorders, 52 (10.2 %) had attention deficit hyperactivity disorder

(ADHD), and 24 (4.7 %) had a disruptive behavior disorder (Table 2).

Only eight of the participants (6 %) who received any psychiatric diagnosis sought treatment for their symptoms at any point; the parents of 50 (37.6 %), however, considered that their child might need to see a psychiatrist or a psychologist. Due to the small number of participants that sought treatment, no further analysis was possible on this group.

Habitual substance use, defined as daily or almost daily use in the 30-days before the interview, was endorsed by a minority of participants with 12 (2.4 %) reporting smoking cigarettes and 9 (1.8 %) reporting drinking alcohol. Occasionally smoking marijuana in the past 30 days was reported by 4 (0.8 %) and none reported using any other drugs. Substance use, however, was not considered in the calculation of the prevalence of any psychiatric disorder.

Correlates of psychiatric disorders (Table 3)

Individual demographic characteristics

There was no association between having any psychiatric disorder as an aggregate group and gender ($\chi^2(1, 510) = 0.24, p > 0.05$), age group ($\chi^2(2, 510) = 0.61, p > 0.05$), or nationality ($\chi^2(1, 510) = 0.06, p > 0.05$).

Family structure

Having a psychiatric disorder was associated separately with the biological mother not permanently living at home and the biological father not permanently living at home. Additionally, the prevalence of psychiatric disorders among the different parental marital statuses (married = 24.0 %, separated/divorced = 51.9 %, and deceased/widowed = 43.8 %) differed at a statistically significant level ($\chi^2(2, 510) = 12.96, p = 0.002$). Adolescents with psychiatric disorders were three times more likely to be from families in which the biological parents were divorced, separated, or deceased as compared to married. In further multivariable logistic regression analyses, only parental marital status was included in the models as a proxy for having the mother and father at home because they were strongly associated in the sample.

Socioeconomic status

While the paternal educational level was marginally associated with having a psychiatric disorder ($\chi^2(4, 510) = 9.51, p = 0.05$), maternal educational level was not ($\chi^2(4, 510) = 2.88, p > 0.05$). Further analyses revealed that the father having a secondary degree or a

Table 1 Sociodemographic characteristics of the BEI-PSY sample ($N = 510$)

Sociodemographic characteristic		<i>N</i>	Valid percent (%)	Sociodemographic characteristic		<i>N</i>	Valid percent (%)
Biological sex	Male	286	56.1	Parental marital status	Married	467	91.6
	Female	224	43.9		Separated/divorced	27	5.3
Age group	11–12 years	177	34.8	Household income	Deceased/widowed	16	3.1
	13–15 years	178	34.9		233–800 USD	182	35.7
	16–17 years	159	31.2		801–1600 USD	222	43.5
Nationality	Lebanese	459	90.0	More than 1601 USD	101	19.8	
	Not Lebanese	51	10.0		Unspecified	5	0.9
Chronic medical condition	Yes	80	15.7	Paternal educational level	Less than elementary	20	3.9
	No	430	84.3		Elementary or middle	222	43.5
Psychiatric family history	Yes	28	5.5	School	Has secondary school	117	22.9
	No	479	94.5		Degree		
	Missing	3	0.01		University level	117	22.9
Schooling	Private—formal	314	61.6	Maternal educational level	Education		
	Public—formal	150	29.4		Master’s or above	34	6.7
	Vocational	16	3.1		Less than elementary	25	4.9
	Other ^a	3	0.6		Elementary or middle	199	39.0
	Does not attend school	27	5.3		School		
Repeated at least one school grade	No	349	68.4	Has secondary school	147	28.8	
	Yes	134	26.3		Degree		
	Not applicable	27	5.3		University level	120	23.5
Receive private tutoring at home	No	407	79.8	Education	Master’s or above	19	3.7
	Yes	76	14.9				
	Not applicable	27	5.3				
Individuals permanently at home	Biological	491	96.3	Mother Biological			
	Father	473	92.7				

^a “Other” refers to schooling for individuals with special needs and to boarding schools

higher college degree was associated with 35 % decreased odds of the adolescent having a psychiatric disorder. Other indicators of socioeconomic status (SES) including the presence of a nanny/house-aid at home and the attendance of a public versus private school were not associated with having a disorder. Having a psychiatric disorder was associated with not attending school while family income in the lower tertile was associated with a 50 % increase in the likelihood of having a psychiatric disorder at a $p = 0.072$. Not attending school was used as a proxy for SES indicators in multivariate analyses as it was highly correlated with paternal educational level and family income.

School-related factors

Among the 483 participants who attended school, repeating a school grade and receiving private tutoring at home were each associated with having a psychiatric disorder. Since data on school factors was only available for participants who attended schools, these variables were not used in further analyses.

Personal medical and family psychiatric history

Having a chronic medical condition and having a history of psychiatric conditions in a first or second degree family

Table 2 Prevalence and distribution of psychiatric disorders in the total BEI-PSY sample and by gender and age groups

DSM-IV disorder	Total sample <i>n</i> (%)	Gender		Test-statistic	Age group			Test-statistic
		Males <i>n</i> (%)	Females <i>n</i> (%)		11–12 <i>n</i> (%)	13–15 <i>n</i> (%)	16–17 <i>n</i> (%)	
Any diagnosis ^a	133 (26.1)	77 (26.9)	56 (25.0)	$X^2(1, 510) = 0.24$	47 (26.6)	49 (27.5)	37 (23.8)	$X^2(2, 510) = 0.61$
1 diagnosis	72 (14.1)	45 (15.7)	27 (12.1)	–	32 (18.1)	23 (12.9)	17 (11.3)	–
2 diagnoses	41 (8.0)	23 (8.0)	18 (8.0)	–	13 (7.3)	17 (9.6)	11 (7.3)	–
3 diagnoses	16 (3.1)	6 (2.1)	10 (4.5)	–	2 (1.1)	6 (3.4)	8 (4.6)	–
4 or more diagnoses	4 (0.8)	3 (1.0)	1 (0.4)	–	0 (0.0)	3 (1.7)	1 (0.7)	–
Emotional disorders	87 (17.1)	39 (13.6)	48 (21.4)	$X^2(1, 510) = 5.39^*$	27 (15.3)	33 (18.5)	27 (17.2)	$X^2(2, 510) = 0.70$
Mood disorders	34 (6.7)	13 (4.5)	21 (9.4)	$X^2(1, 510) = 4.71^*$	5 (2.8)	12 (6.7)	17 (11.0)	$X^2(2, 510) = 8.81^*$
Any anxiety disorder	67 (13.1)	31 (10.8)	36 (16.1)	$X^2(1, 510) = 3.01$	23 (13.0)	28 (15.7)	16 (10.3)	$X^2(2, 510) = 2.13$
Externalizing disorders	60 (11.8)	43 (15.0)	17 (7.6)	$X^2(1, 510) = 6.71^*$	18 (10.2)	25 (14.0)	17 (11.0)	$X^2(2, 510) = 1.42$
Attention deficit/ hyperactivity disorder	52 (10.2)	35 (12.2)	17 (7.6)	$X^2(1, 510) = 2.96$	17 (9.6)	22 (12.4)	13 (8.4)	$X^2(2, 510) = 1.53$
Conduct disorders	24 (4.7)	19 (6.6)	5 (2.2)	$X^2(1, 510) = 5.45^*$	4 (2.3)	12 (6.7)	8 (5.3)	$X^2(2, 510) = 4.08$
Oppositional defiant disorder	15 (2.9)	10 (3.5)	5 (2.2)	–	4 (2.3)	8 (4.5)	3 (2.0)	–
Conduct disorder	10 (2.0)	9 (3.1)	1 (0.4)	–	1 (0.6)	4 (2.2)	5 (3.2)	–
Other conduct disorder	18 (3.5)	3 (1.0)	0 (0.0)	–	0 (0.0)	1 (0.6)	2 (1.3)	–
Pervasive developmental disorders	5 (1.0)	3 (1.0)	2 (0.9)	–	2 (1.2)	2 (1.2)	1 (0.6)	–
Other ^b	15 (2.0)	10 (3.3)	5 (2.1)		7 (4.1)	3 (1.7)	5 (3.2)	
Total	510	286	224		177	178	151	

* $p < 0.05$ ^a “Any diagnosis” does not include substance use disorders^b “Other” includes: tic disorders, sexual disorders, kleptomania, psychotic disorders, eating disorders

member were each associated with having a psychiatric disorder.

Peer-relations

Higher scores on both the PRQ-Bullies and the PRQ-Victim subscales were associated with greater likelihood of having a psychiatric disorder.

Multivariable logistic regressions

Higher likelihood of having a psychiatric disorder was associated with biological parents not being married at the time of interview (divorced, separated, or deceased), the adolescent not attending school, having a chronic medical condition, having a family history of psychiatric disorders and having higher scores on PRQ-Bullies and PRQ-Victims (Table 3).

Correlates of emotional versus externalizing disorders

While a higher likelihood of having emotional disorders was associated with being female, biological parents not

being married at interview, having a chronic medical condition and higher scores on PRQ-Victim (Table 4), higher likelihood of having externalizing disorders was associated with being male, not attending school, and higher scores on both PRQ-Bullies and PRQ-Victim (Table 5).

Discussion

BEI-PSY, the first study to investigate the prevalence of psychiatric disorders among adolescents residing in Beirut, showed that about one in four adolescents suffer from at least one psychiatric disorder, most commonly anxiety disorders and ADHD. Parental marital status, paternal educational level, not attending school, repeating school grades, receiving private tutoring at home, psychiatric family history, having chronic medical conditions, as well as higher propensity to bullying and to being victimized by peers all emerged as correlates of having a psychiatric disorder.

The prevalence of psychiatric disorders in our study is higher than what has been reported in the international literature [5, 23], in systematic reports from neighboring

Table 3 Sociodemographic and other correlates of having any psychiatric disorder

Variable	Category	Unadjusted odds ratio	95 % CI	Adjusted odds ratio one [†]	95 % CI	Adjusted odds ratio two [‡]	95 % CI
Biological mother living at home	No	3.32*	[1.32, 8.27]	3.48**	[1.37, 8.80]	–	–
	Yes	–	–	–	–	–	–
Biological father living at home	No	2.32*	[1.17, 4.59]	2.48**	[1.24, 4.95]	–	–
	Yes	–	–	–	–	–	–
Biological parents married at time of interview	No	3.03***	[1.60, 5.71]	3.29***	[1.72, 6.28]	3.13**	[1.54, 6.25]
	Yes	–	–	–	–	–	–
Father finished secondary school	Yes	0.64*	[0.43, 0.95]	0.65*	[0.44, 0.98]	–	–
	No	–	–	–	–	–	–
Attends school	No	2.81**	[1.28, 6.13]	3.05**	[1.38, 6.75]	2.70	[1.13, 6.42]
	Yes	–	–	–	–	–	–
Repeated school grade	Yes	2.04**	[1.32, 3.17]	2.12**	[1.36, 3.31]	–	–
	No	–	–	–	–	–	–
Receives home tutoring	Yes	3.02***	[1.18, 5.04]	2.71***	[1.63, 4.50]	–	–
	No	–	–	–	–	–	–
Adolescent has chronic medical condition	Yes	1.91*	[1.15, 3.15]	1.88*	[1.13, 3.11]	1.75*	[1.01, 3.04]
	No	–	–	–	–	–	–
Family history of psychiatric disorder(s)	Yes	2.62*	[1.20, 5.67]	2.64*	[1.22, 5.71]	1.92	[0.83, 4.54]
	No	–	–	–	–	–	–
PRQ-Bullies		1.20***	[1.10, 1.32]	1.21***	[1.10, 1.33]	1.17**	
PRQ-Victim		1.30***	[1.13, 1.44]	1.30***	[1.17, 1.43]	1.23***	

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$ [†] Adjusting for age in years and gender[‡] Multivariable logistic regression model included age in years and gender entered in the first block; attending school, parental marital status, having a chronic medical condition, PRQ-Bullies, PRQ-Victim, and family history of psychiatric disorders in the second block

Arab countries [8–11], and in many of the studies that have used the DAWBA as a diagnostic tool [24]. Our figure seems to be primarily driven by a higher occurrence of anxiety disorders and ADHD as compared to pooled worldwide estimates [5, 25]. Previous reports on ADHD in the Arab World [26] and in Lebanon described lower rates. For example, a national study in school aged children in Lebanon revealed a rate of 3.2 %, using a teacher rating scale [15]. Our study, however, collected data in a structured way from both parents and adolescents and our sample was taken from an urban environment—a setting that has been associated with increased parental reporting of ADHD [27]. With one in ten adolescents in our sample diagnosed with ADHD, our study provides evidence to prioritize ADHD in future interventions including education and support for teachers and parents.

Our prevalence of anxiety disorders at 13.1 % compares interestingly with neighboring Arab populations. While 1.6 % in a United Arab Emirates (UAE) school sample [8] and 5.6 % in Oman [10], the prevalence of anxiety disorders among a pre-adolescent sample in the Gaza strip was (21.5 %) [28]. Despite methodological differences among the studies, exposure to war and violence may also be an

important contributor to these variations. While Oman and UAE have not experienced political turmoil or insecurity in the past few decades, Gaza has experienced constant instability. In addition to armed conflicts in recent years, political turmoil, financial instability, and concerns about security continue to be daily stressors in Beirut. The relationship between psychiatric disorders, particularly anxiety disorders, and exposure to war has been established among adults as well as children and adolescents in Lebanon [14, 17, 29]. Among Lebanese adolescents, however, exposure to war has been both direct, through experiencing frequent turmoil since 2005, and indirect, through parental and societal reaction to a long civil war between 1975 and the early 1990s, and thus, warrants particular attention to understand the mechanisms underlying the development of these disorders.

Despite the relatively high disorder prevalence, only 6 % of those who were diagnosed with a psychiatric disorder sought professional help with a higher percentage of parents having considered that their child might need help. Although a majority of children and adolescents with mental illness do not receive treatment [30], the rate in our sample is alarmingly lower than that reported elsewhere, especially in

Table 4 Sociodemographic and other correlates of having an emotional disorder

Variable	Category	Unadjusted OR	95 % CI	Adjusted OR 1 [†]	95 % CI	Adjusted OR 2 [‡]	95 % CI
Gender	Female	1.73*	[1.09, 2.75]	–	–	1.81*	[1.10, 2.98]
	Male	–	–	–	–	–	–
Age	–	1.01	[0.91, 1.13]	–	–	1.01	[0.89, 1.13]
Biological mother living at home	No	3.79**	[1.48, 9.73]	3.57**	[1.38, 9.25]	–	–
	Yes	–	–	–	–	–	–
Biological father living at home	No	3.80***	[1.88, 7.67]	3.75***	[1.84, 7.67]	–	–
	Yes	–	–	–	–	–	–
Parental marital status at interview	Not Married	4.15***	[2.15, 8.00]	4.15***	[2.12, 8.12]	3.58***	[1.74, 7.37]
	Married	–	–	–	–	–	–
Attends school	No	2.60*	[1.13, 5.99]	2.59*	[1.10, 6.18]	1.95	[0.74, 5.13]
	Yes	–	–	–	–	–	–
Receives home tutoring	Yes	2.00*	[1.09, 3.54]	1.95*	[1.08, 3.51]	–	–
	No	–	–	–	–	–	–
Chronic medical condition	Yes	2.13**	[1.22, 3.72]	2.22**	[1.26, 3.91]	2.15*	[1.17, 3.95]
	No	–	–	–	–	–	–
Family member receiving psychiatric medication(s)	Positive	2.44*	[1.06, 5.58]	2.38*	[1.03, 5.49]	2.04	[0.83, 5.10]
	Negative	–	–	–	–	–	–
PRQ-Victim	–	1.32***	[1.19, 1.47]	1.34***	[1.20, 1.49]	1.34***	–

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

[†] Adjusting for age in years and gender

[‡] Multivariable logistic regression model included age in years and gender entered in the first block; parental marital status, attending school, having a chronic medical condition, having a family member receiving psychiatric medication, and PRQ-Victim scores entered in the second block

Western countries. For example, in the National Comorbidity Survey—Adolescent Supplement (NCS-A), around 45 % of adolescents with a psychiatric disorder received some form of mental health service [31]. Conversely, in Oman, treatment seeking rates were similar to our findings [32]. No formal reports on the pathways and patterns of referral of mental disorders are available in Lebanon to help us understand the areas that require particular attention. However, public awareness on mental health remained virtually nonexistent until recent efforts by non-governmental and governmental organizations yielded some substantial media attention. Additionally, the mental health coverage system in Lebanon raises significant concerns regarding its equity and effectiveness whereby reliance on out-of-pocket expenditure and the fragmented nature of coverage may make mental health care too expensive for some [33]. With only about 75 practicing psychiatrists (1.9:100,000), Lebanon would be exemplary for studying and implementing task-shifting strategies, such as those proposed by the World Health Organization, involving schools and primary care in mental health service planning.

Our study also provides evidence regarding groups at higher odds of having psychiatric disorders. About 40 % of adolescents with a chronic medical illness were found to

have at least one psychiatric disorder. Evidence supporting routine psychological screening for some chronic conditions, including diabetes [34], has been established. Investigating the applicability and efficacy of screening models in the Lebanese context, including the assessment of available validated screening tools and possible referral strategies considering the limited number of child psychiatrists, is an urgent next step in bridging the treatment gap in this population. In addition, one out of two adolescents whose biological parents were divorced, separated, or deceased were also found to have a psychiatric disorder. While many studies have reported on this association, highlighting parental divorce at an early age [35], family conflict before and after separation [36], and the lack of parental involvement after divorce [37] as predictors of psychopathology, these findings were limited to Western societies; therefore, further studies are needed to clarify the nature of this association, and room for intervention, in the Lebanese context. With respect to socioeconomic status, two proxies—paternal educational level and not attending school—were found to be associated with having a psychiatric disorder. While a similar relationship was not found among Lebanese adults [14], our findings yet again highlight that groups with less resources require the most attention.

Table 5 Sociodemographic and other correlates of externalizing disorders

Variable	Category	Unadjusted OR	95 % CI	Adjusted OR [†]	95 % CI	Adjusted OR 2 [‡]	95 % CI
Gender	Male	2.17*	[1.19, 3.85]	–	–	2.36	[1.24, 4.49]
	Female	–	–	–	–	–	–
Age	–	0.98	[0.87, 1.12]	–	–	0.96	[0.83, 1.11]
Biological mother living at home	No	3.74**	[1.36, 10.23]	4.42	[1.57, 12.45]	–	–
	Yes	–	–	–	–	–	–
Parental marital status at interview	Not married	2.16	[0.98, 4.76]	2.40*	[1.07, 11.51]	2.15	[0.86, 5.35]
	Married	–	–	–	–	–	–
Father finished secondary school	Yes	1.64	[0.95, 2.83]	1.65	[0.95, 2.87]	–	–
	No	–	–	–	–	–	–
Attends school	No	4.24***	[1.81, 9.90]	4.76***	[1.96, 11.49]	4.44**	[1.70, 11.63]
	Yes	–	–	–	–	–	–
Repeated school grade	Yes	2.38**	[1.31, 4.30]	2.49**	[1.36, 4.52]	–	–
	No	–	–	–	–	–	–
Receives home tutoring	Yes	2.62**	[1.40, 4.89]	2.46**	[1.31, 4.61]	–	–
	No	–	–	–	–	–	–
Chronic medical condition	Yes	1.97*	[1.04, 3.75]	2.15*	[1.19, 3.89]	1.85	[0.91, 3.78]
	No	–	–	–	–	–	–
Family history	Positive	3.29**	[1.38, 7.83]	3.54**	[1.46, 8.60]	2.63	[0.98, 7.06]
	Negative	–	–	–	–	–	–
PRQ-Bully	–	1.32***	[1.18, 1.47]	1.31***	[1.17, 1.47]	1.29***	[1.14, 1.46]
PRQ-Victim	–	1.26***	[1.12, 1.42]	1.27***	[1.13, 1.43]	1.17*	[1.02, 1.34]

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$ [†] Adjusting for age in years and gender[‡] Multivariable logistic regression model included age in years and gender entered in the first block; parental marital status, attending school, having a chronic medical condition, a family history of psychiatric disorders, PRQ-Bully scores, and PRQ-Victim scores entered in the second block

School factors have emerged as important predictors of disorders in our sample. Adolescents who repeated school grades and who required assistance in their schoolwork were found to have more psychiatric disorders than their peers. Additionally, experiencing more bullying, both as victims or perpetrators, was associated with higher likelihood of having any psychiatric disorder with the former predicting both emotional and externalizing disorders and the latter predicting externalizing disorders only. School mental health screening, particularly models relying on systematic identification of individuals at risk [38], have been found to be effective as referral strategies for these adolescents.

Limitations

Due to the lack of an available recent census and local statistics, we opted to purposefully select neighborhoods in a way to represent the different socioeconomic levels

within Beirut. This may limit our ability to generalize our findings to the population of Arabic speaking adolescents living in Beirut. In addition, our response rate of 51 % falls in the lower range of other community-based studies. For example, while response rate in the National Comorbidity Survey of Adolescents was 75.6 % [39], the response rate in the second Australian Child and Adolescent Survey of Mental health and wellbeing was 55 % [40]. The low response rate may have introduced biases to our sample, the most concerning of which is the possibility of selective recruitment whereby families with adolescents who may be suffering from mental illness were more likely to participate in the study which could have inflated our prevalence estimates. Another limitation is that we only visited households twice for recruitment. While revisiting the households several times may have improved the response rate especially in the group who did not answer the door and in cases where only the helper was present, the response rate would not have improved the outcomes in

cases where data collectors could not access the building and where parents refused participation before we were able to establish eligibility. Solutions to these challenges need to take into account the local context. Notwithstanding these concerns, our sample seems to reflect general demographic and socioeconomic trends within Lebanon. For example, the ratio of boys to girls in our sample was 1.27 which is only slightly higher than the ratio reported by the Center of Administration of Statistics (1.07–1.17) [41]. In addition, the parental educational level was in line with statistics regarding the maximal level of education among Lebanese adults [41] with about a third of our sample having less than secondary level of education and a third of the adolescent sample having one or both of their parents complete a college education while monthly income. Moreover, and with regards to income levels, the average monthly income per producer in Beirut in 2007 was 606 USD [41]; our sample falls average in terms of socioeconomic status given that the median HH (monthly) income was about 1000 USD or less, and only 12 % reported a HH income of more than 2000 USD. However, the inability to test the representativeness of the sample, together with the sample being limited to Beirut, remains a major limitation to the generalizability of our results to Lebanon.

While the DAWBA as a diagnostic tool has been extensively used in prevalence estimation studies, it is not without some limitations. In the Turkish translation, the agreement between the clinical diagnoses versus the diagnoses generated using DAWBA was only in the acceptable range for behavioral disorders [42]. The Arabic translation also had an inter-rater agreement for anxiety disorders that was only in the acceptable range [22]. Additionally, the DAWBA has been deemed to give more conservative estimates in comparison to other widely used tools, such as the DISC and the CAPA, particularly when it comes to internalizing disorders [43]. We also believe that our interview settings may have affected the extent to which adolescents reported substance use. Although the adolescents were asked to complete the substance use section of the DAWBA alone, they were still in the same house, and in some cases in the same room, as their parents, which may have contributed to the underreporting of substance use.

Conclusion

BEI-PSY findings are the first to highlight that psychiatric disorders are highly prevalent in adolescents in Beirut. Our data on treatment gap provides further evidence for mental health advocacy, research and policies focusing on treatment seeking behavior and access to care, respectively.

Acknowledgments This study was funded through the Medical Practice Plan at the American University of Beirut. Data collection was completed by Information International, a research company based in Beirut, Lebanon. The authors would like to thank Dr. Robert Goodman, author of the DAWBA, for his guidance and support.

Compliance with ethical standards

Ethical considerations The study was approved by the Institutional Review Board (IRB) at the American University of Beirut and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consents from participating parents/legal guardians and assents from adolescents were obtained.

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Kessler RC, Angermeyer M, Anthony JC, Graaf R DE, Demyttenaere K, Gasquet I, Gluzman S, Gureje O, Haro JM, Kawakami N, Karam A, Levinson D, Medina Mora ME, Oakley Browne MA, Posada-Villa J, Stein DJ, Adley Tsang CH, Aguilar-Gaxiola S, Alonso J, Lee S, Heeringa S, Pennell BE, Berglund P, Gruber MJ, Petukhova M, Chatterji S, Ustun TB (2007) Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 6(3):168–176
2. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE (2005) Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 62(6):593–602. doi:10.1001/archpsyc.62.6.593
3. Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A (2003) Prevalence and development of psychiatric disorders in childhood and adolescence. *Arch Gen Psychiatry* 60(8):837–844. doi:10.1001/archpsyc.60.8.837
4. Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K, Swendsen J (2010) Lifetime prevalence of mental disorders in U.S. adolescents: results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry* 49(10):980–989. doi:10.1016/j.jaac.2010.05.017
5. Polanczyk GV, Salum GA, Sugaya LS, Caye A, Rohde LA (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. doi:10.1111/jcpp.12381
6. Okasha A, Karam E, Okasha T (2012) Mental health services in the Arab world. *World Psychiatry* 11(1):52–54
7. WHO (2011) Atlas: child, adolescent, and maternal mental health resources in the Eastern Mediterranean Region. EMRO technical publication series. World Health Organization, Regional Office for the Eastern Mediterranean, Geneva
8. Eapen V, al-Gazali L, Bin-Othman S, Abou-Saleh M (1998) Mental health problems among schoolchildren in United Arab Emirates: prevalence and risk factors. *J Am Acad Child Adolesc Psychiatry* 37(8):880–886. doi:10.1097/00004583-199808000-00019
9. Eapen V, Jakka ME, Abou-Saleh MT (2003) Children with psychiatric disorders: the Al Ain Community Psychiatric Survey. *Can J Psychiatry* 48(6):402–407
10. Jaju S, Al-Adawi S, Al-Kharusi H, Morsi M, Al-Riyami A (2009) Prevalence and age-of-onset distributions of DSM IV mental

- disorders and their severity among school going Omani adolescents and youths: WMH-CIDI findings. *Child Adolesc Psychiatry Ment Health* 3(1):29. doi:[10.1186/1753-2000-3-29](https://doi.org/10.1186/1753-2000-3-29)
11. Mahfouz AA, Al-Gelban KS, Al Amri H, Khan MY, Abdelmoneim I, Daffalla AA, Shaban H, Mohammed AA (2009) Adolescents' mental health in Abha city, southwestern Saudi Arabia. *Int J Psychiatry Med* 39(2):169–177
 12. Drury J, Williams R (2012) Children and young people who are refugees, internally displaced persons or survivors or perpetrators of war, mass violence and terrorism. *Curr Opin Psychiatry* 25(4):277–284. doi:[10.1097/YCO.0b013e328353eeae6](https://doi.org/10.1097/YCO.0b013e328353eeae6)
 13. Karam EG, Mneimneh ZN, Karam AN, Fayyad JA, Nasser SC, Chatterji S, Kessler RC (2006) Prevalence and treatment of mental disorders in Lebanon: a national epidemiological survey. *Lancet* 367(9515):1000–1006. doi:[10.1016/s0140-6736\(06\)68427-4](https://doi.org/10.1016/s0140-6736(06)68427-4)
 14. Karam EG, Mneimneh ZN, Dimassi H, Fayyad JA, Karam AN, Nasser SC, Chatterji S, Kessler RC (2008) Lifetime prevalence of mental disorders in Lebanon: first onset, treatment, and exposure to war. *PLoS Med* 5(4):e61. doi:[10.1371/journal.pmed.0050061](https://doi.org/10.1371/journal.pmed.0050061)
 15. Richa S, Rohayem J, Chammai R, Kazour F, Haddad R, Hleis S, Alameddine A, Gerbaka B (2014) ADHD prevalence in Lebanese school-age population. *J Atten Disord* 18(3):242–246. doi:[10.1177/1087054712445065](https://doi.org/10.1177/1087054712445065)
 16. Mahfoud ZR, Afifi RA, Haddad PH, Dejong J (2011) Prevalence and determinants of suicide ideation among Lebanese adolescents: results of the GSHS Lebanon 2005. *J Adolesc* 34(2):379–384. doi:[10.1016/j.adolescence.2010.03.009](https://doi.org/10.1016/j.adolescence.2010.03.009)
 17. Karam EG, Fayyad J, Karam AN, Melhem N, Mneimneh Z, Dimassi H, Tabet CC (2014) Outcome of depression and anxiety after war: a prospective epidemiologic study of children and adolescents. *J Trauma Stress* 27(2):192–199. doi:[10.1002/jts.21895](https://doi.org/10.1002/jts.21895)
 18. Central Administration of Statistics (CAS) (2004) The national survey of household living conditions. Presidency of the Council of Ministers, Lebanese Republic
 19. Goodman R, Ford T, Richards H, Gatward R, Meltzer H (2000) The development and well-being assessment: description and initial validation of an integrated assessment of child and adolescent psychopathology. *J Child Psychol Psychiatry* 41(5):645–655
 20. Rigby K, Slee PT (1993) Dimensions of interpersonal relation among Australian children and implications for psychological well-being. *J Soc Psychol* 133(1):33–42. doi:[10.1080/00224545.1993.9712116](https://doi.org/10.1080/00224545.1993.9712116)
 21. Alyahri A, Goodman R (2006) Validation of the Arabic Strengths and Difficulties Questionnaire and the Development and Well-Being Assessment. *East Mediterr Health J* 12(Suppl 2):S138–S146
 22. Zeinoun P, Bawab S, Atwi M, Hariz N, Tavitian L, Khani M, Nahas Z, Maalouf FT (2013) Validation of an Arabic multi-informant psychiatric diagnostic interview for children and adolescents: development and Well Being Assessment-Arabic (DAWBA-Arabic). *Compr Psychiatry* 54(7):1034–1041. doi:[10.1016/j.comppsy.2013.04.012](https://doi.org/10.1016/j.comppsy.2013.04.012)
 23. Roberts RE, Attkisson CC, Rosenblatt A (1998) Prevalence of psychopathology among children and adolescents. *Am J Psychiatry* 155(6):715–725
 24. Goodman A, Heiervang E, Fleitlich-Bilyk B, Alyahri A, Patel V, Mullick MS, Slobodskaya H, Dos Santos DN, Goodman R (2012) Cross-national differences in questionnaires do not necessarily reflect comparable differences in disorder prevalence. *Soc Psychiatry Psychiatr Epidemiol* 47(8):1321–1331. doi:[10.1007/s00127-011-0440-2](https://doi.org/10.1007/s00127-011-0440-2)
 25. Polanczyk G, de Lima MS, Horta BL, Biederman J, Rohde LA (2007) The worldwide prevalence of ADHD: a systematic review and meta-regression analysis. *Am J Psychiatry* 164(6):942–948. doi:[10.1176/ajp.2007.164.6.942](https://doi.org/10.1176/ajp.2007.164.6.942)
 26. Farah LG, Fayyad JA, Eapen V, Cassir Y, Salamoun MM, Tabet CC, Mneimneh ZN, Karam EG (2009) ADHD in the Arab world: a review of epidemiologic studies. *J Atten Disord* 13(3):211–222. doi:[10.1177/1087054708325976](https://doi.org/10.1177/1087054708325976)
 27. Dopfner M, Breuer D, Wille N, Erhart M, Ravens-Sieberger U (2008) How often do children meet ICD-10/DSM-IV criteria of attention deficit-hyperactivity disorder and hyperkinetic disorder? Parent-based prevalence rates in a national sample—results of the BELLA study. *Eur Child Adolesc Psychiatry* 17(Suppl 1):59–70. doi:[10.1007/s00787-008-1007-y](https://doi.org/10.1007/s00787-008-1007-y)
 28. Thabet AA, Vostanis P (1998) Social adversities and anxiety disorders in the Gaza Strip. *Arch Dis Child* 78(5):439–442
 29. Farhood LF, Dimassi H (2012) Prevalence and predictors for post-traumatic stress disorder, depression and general health in a population from six villages in South Lebanon. *Soc Psychiatry Psychiatr Epidemiol* 47(4):639–649. doi:[10.1007/s00127-011-0368-6](https://doi.org/10.1007/s00127-011-0368-6)
 30. Zwaanswijk M, Verhaak PF, Bensing JM, van der Ende J, Verhulst FC (2003) Help seeking for emotional and behavioural problems in children and adolescents: a review of recent literature. *Eur Child Adolesc Psychiatry* 12(4):153–161. doi:[10.1007/s00787-003-0322-6](https://doi.org/10.1007/s00787-003-0322-6)
 31. Costello EJ, He JP, Sampson NA, Kessler RC, Merikangas KR (2014) Services for adolescents with psychiatric disorders: 12-month data from the National Comorbidity Survey-Adolescent. *Psychiatr Serv* 65(3):359–366. doi:[10.1176/appi.ps.201100518](https://doi.org/10.1176/appi.ps.201100518)
 32. Al Riyami AA, Al Adawi SH, Al Kharusi HA, Morsi MM, Jaju SS (2009) Health services utilization by school going Omani adolescents and youths with DSM IV mental disorders and barriers to service use. *Int J Ment Health Syst* 3(1):22. doi:[10.1186/1752-4458-3-22](https://doi.org/10.1186/1752-4458-3-22)
 33. 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
 34. Corathers SD, Kichler J, Jones NH, Houchen A, Jolly M, Morwessel N, Crawford P, Dolan LM, Hood KK (2013) Improving depression screening for adolescents with type 1 diabetes. *Pediatrics* 132(5):e1395–e1402. doi:[10.1542/peds.2013-0681](https://doi.org/10.1542/peds.2013-0681)
 35. Stadelmann S, Perren S, Groeben M, von Klitzing K (2010) Parental separation and children's behavioral/emotional problems: the impact of parental representations and family conflict. *Fam Process* 49(1):92–108. doi:[10.1111/j.1545-5300.2010.01310.x](https://doi.org/10.1111/j.1545-5300.2010.01310.x)
 36. Sandler IN, Wheeler LA, Braver SL (2013) Relations of parenting quality, interparental conflict, and overnights with mental health problems of children in divorcing families with high legal conflict. *J Fam Psychol* 27(6):915–924. doi:[10.1037/a0034449](https://doi.org/10.1037/a0034449)
 37. Modecki KL, Hagan MJ, Sandler I, Wolchik SA (2015) Latent profiles of nonresidential father engagement six years after divorce predict long-term offspring outcomes. *J Clin Child Adolesc Psychol* 44(1):123–136. doi:[10.1080/15374416.2013.865193](https://doi.org/10.1080/15374416.2013.865193)
 38. Husky MM, Kaplan A, McGuire L, Flynn L, Chrostowski C, Olfson M (2011) Identifying adolescents at risk through voluntary school-based mental health screening. *J Adolesc* 34(3):505–511. doi:[10.1016/j.adolescence.2010.05.018](https://doi.org/10.1016/j.adolescence.2010.05.018)
 39. Kessler RC, Avenevoli S, Costello EJ, Green JG, Gruber MJ, Heeringa S, Merikangas KR, Pennell BE, Sampson NA, Zaslavsky AM (2009) National comorbidity survey replication adolescent supplement (NCS-A): II. Overview and design. *J Am Acad Child Adolesc Psychiatry* 48(4):380–385. doi:[10.1097/CHI.0b013e3181999705](https://doi.org/10.1097/CHI.0b013e3181999705)
 40. Hafekost J, Lawrence D, Boterhoven de Haan K, Johnson SE, Saw S, Buckingham WJ, Sawyer MG, Ainley J, Zubrick SR (2015) Methodology of young minds matter: the second Australian Child and Adolescent Survey of Mental Health and Well-being. *Aust N Z J Psychiatry*. doi:[10.1177/0004867415622270](https://doi.org/10.1177/0004867415622270)

41. Central Administration of Statistics (CAS) (2007) The national survey of household living conditions. Presidency of the Council of Ministers, Lebanese Republic
42. Dursun OB, Guvenir T, Aras S, Ergin C, Mutlu C, Baydur H, Ozbek A, Ozek H, Alsen S, Iscanli L, Karaman BI, Goodman R (2013) A new diagnostic approach for Turkish speaking populations DAWBA Turkish version. *Epidemiol Psychiatr Sci* 22(3):275–282. doi:[10.1017/s2045796012000479](https://doi.org/10.1017/s2045796012000479)
43. Angold A, Erkanli A, Copeland W, Goodman R, Fisher PW, Costello EJ (2012) Psychiatric diagnostic interviews for children and adolescents: a comparative study. *J Am Acad Child Adolesc Psychiatry* 51(5):506–517. doi:[10.1016/j.jaac.2012.02.020](https://doi.org/10.1016/j.jaac.2012.02.020)