



الاتحاد الاطباء النفسانيين العرب
ARAB FEDERATION OF PSYCHIATRISTS

The Arab Journal of Psychiatry المجلة العربية للطب النفسي

Vol. 28 No.1, May 2017
المجلد ٢٨ العدد الأول، مايو ٢٠١٧



The Arab Journal of Psychiatry
The Editorial Board

The International Editors

Dinesh Bhugra – UK
David Sheehan – USA
Norman Sartorius – Switzerland
Malek Badri – Malaysia

The Associate Editors

Abdul Manaf Aljadri – Jordan Elie Karam – Lebanon
Numan Ali – Iraq M. Faker Eleslam – Egypt
Adib Essali – New Zealand Tarek Okasha – Egypt

The Editor in chief

Walid Sarhan – Jordan

The Deputy Editor

Suhaila Ghuloum – Qatar

The Honorary Editors

Ahmad Okasha – Egypt
Adnan Takriti – Jordan

The English Editor

Tori Snell – UK

Statistics Consultant

Kathy Sheehan – USA

Executive Secretary

Raja Nasrallah – Jordan

Treasurers

Hussein Alawad – Jordan

Website:

<http://arabjournalpsychiatry.com>

The Editorial Board

Nasser Shuriquie – Jordan Marwan Dwairy – Palestine
Basil Alchalabi – Iraq Abdelaziz Thabet – Palestine
Wail Abohemdy – Egypt Elham Khatab – Iraq
George Karam – Lebanon Ghada Elkhoully – Egypt
John Fayyad – Lebanon Mohamad Abo Saleh – UK
Tarek – Al Habib – Saudi Arabia Malek Bajbouj – Germany
Adel Zayed – Kuwait Charlotte Kamel – Bahrain
Afaf Hamed – Egypt Ahmad Alhadi – Saudi Arabia
Maha Yonis – Iraq Jamal Turkey – Tunisia
Issam Alansari – Kuwait Tori Snell – UK

The Editorial Assistants – Jordan

Radwan Bani Mustafa
Ali Alqam
Nayel Aladwan
Nabeel Alhmoud
Tayseer Elias
Bahjat Abderrahim

Mohamad Dabbas
Basma Kilani
Ahmad Jaloudi
Walid Shnaiqat
Ahmad Alsalem
Ayman Rabie

Alaa Albeshtawi
Hashem Fakhouri
Ahid Husni
Mohamad Shoqirat
Nasri Jasser
Diana Qasas

Instruction to Authors

The Arab Journal of Psychiatry (AJP) is published by the Arab Federation of Psychiatrists since 1989 in Jordan.

The Journal is biannual published in May and November electronically and as hard copy. Original scientific reports, review articles, and articles describing the clinical practice of Psychiatry will be of interest for publication in AJP. The Articles should not be published before. The articles may be written in English or Arabic and should always be accompanied by an abstract in English and Arabic. All Papers are accepted upon the understanding that the work has been performed in accordance with national and International laws and ethical guidelines. Manuscripts submitted for publication in the Arab Journal of Psychiatry should be sent to:

The Chief Editor.

Papers are submitted in electronic form

- Title, running head (Max: 40 letters), title of the article in English and Arabic, the names of authors should be without their titles and addresses in both languages.
- Abstract in English (max: 200 words). It should follow a structured format (objectives, method, results and conclusion). It should be followed by key words (max. 5).
- Declaration of interest after the key words.
- Names of authors, titles, and full addresses and address for correspondence at the end of the paper.
- Acknowledgment of support and persons who have had major contribution to the study can be included after the references.
- Arabic abstract like the English abstract should follow a structured format. And it follows the references section (last page).
- All Pages should be numbered.

Tables

Tables should be typed with double-spaced in separate pages. They should be numbered with Arabic (e.g1, 2, 3) numerals and have a short descriptive headings.

Illustrations

All illustration should be submitted camera-ready; line drawings/diagrams should be approximately twice the size they will appear in print.

Reference List

References should follow the 'Van Couver style' only the numbers appear in the text. List them consecutively in the order in which they appear in the text (not alphabetically).

Example of references:

- Zeigler FJ, Imboden, JB, Meyer E. Contemporary conversion reactions: a clinical study. Am. J. Psychiatry 1960: 116:901 – 10.
- Mosey AC. Occupational therapy. Configuration of a profession. New York: Raven Press, 1981.

Mailing Address: Dr. Walid Sarhan - The Chief Editor -The Arab Journal of Psychiatry

P.O. Box 541212 Postal Code 11937 Amman – Jordan

Tel: 00962 – 6 – 5335446 Fax: 00962 – 6 – 5349763

Email: wsarhan34@gmail.com

Journal Website: <http://arabjournalpsychiatry.com/>

Editorial letter

Dear the readers

It is my pleasure to introduce the new issue of the journal; it is available online with all the previous issues since 1989.

The journal is available on ALMANHAL database and PSYCHINFO as well as EPSCO.

All the issues are available on DAR ALMANDUMAH digital database.

Please register your name and email on our website.

My gratitude to the executive committee of the Arab Federation of Psychiatrists for all the support, thank you all the active editorial board.

Walid Sarhan

Amman-Jordan

<http://www.mandumah.com/databases>

<https://www.ebsco.com/>

<http://www.apa.org/pubs/databases/psycinfo/>

<http://arabjournalpsychiatry.com/>

<http://www.almanhal.com/>

Table of Contents

Child Psychiatry and Psychology

- **Mental Health Outcomes for War Exposed Children and Adolescents in the Arab World**
Lynn Itani, Doris Jaalouk, John Fayyad, Jessica Toress Garcia, Fouad Chidiac, Elie Karam 1
- **Non-War Related Childhood Adversities in the Arab World: A Review**
John Fayyad, Joanna Diab, Nada Yousef, Claudia Farhat, Elie Karam..... 26
- **The Relationship between War Trauma and Anxiety and Posttraumatic Stress Disorder among Preschool Children in the Gaza Strip**
Heba Al Ghalayini, Abdelaziz M Thabet..... 36

Schizophrenia

- **Duration of Treatment as a Risk Factor for Metabolic Syndrome in Patients with Schizophrenia Receiving Antipsychotic Medication**
Basma Ahmed, Magda Fahmy, Khaled Abd El Moez, Haydy Hassan..... 46
- **Advances in Understanding the Etiology of Schizophrenia**
Adib Essali52
- **Positive and Negative Symptom Pattern in Schizophrenia**
Twana Abdulrahman Rahim, Hemin Fatih Hama Kareem.....59

Students' Mental Health

- **Prevalence and Severity of Somatic Symptoms, Depression and Anxiety among Medical Students at the Arabian Gulf University: Comparison between Second and Sixth Year**
Ammar Mohamed Abdelaziz ,Khalid Talal Alotaibi ,Jarrah Hamad Alhurayyis ,Turky Abdullah Alqahtani ,Aamer Meshari Alghamlas ,Haifa Mohammed Algahtani ,Haitham Ali Jahrami.....69
- **Prevalence of Eating Disorders among Students at the University of Jordan**
Basma F Kilani76

Psychology

- **A Validation Study of a New Arabic Version of the Adult Dispositional Hope Scale in a Sample of Lebanese College Youth**
Remy R. Elias and Shahe Kazarian83

Case Report

- **Chronic Koro-Like Syndrome Co-morbid with Schizophrenia and Past History of Cannabis Abuse in an Egyptian Patient: Case Report**
Ashraf M M A El-Tantawy92

Mental Health Outcomes for War Exposed Children and Adolescents in the Arab World

Lynn Itani, Doris Jaalouk, John Fayyad, Jessica Toress Garcia, Fouad Chidiac, Elie Karam

تأثير حوادث الحرب الصادمة على الصحة النفسية للأطفال والمراهقين في العالم العربي: ملخص

لين عيتاني، دوريس جعلوك، جون فياض، جسيكا توراس غاريسيا، فؤاد شدياق، ايلي كرم

Abstract

Objective: Many countries in the Arab world have witnessed war. The purpose of the current review is to look at the effect of exposure to war traumata on the mental health of children and adolescents in the Arab world. **Method:** A literature review about the effect of war exposure on the mental health of children/adolescents was conducted for all countries in the Arab world up to September 15, 2014 using the search engines PubMed, and PsycINFO. **Results:** A total of 67 articles were included in the review: seven about Iraq, one about Jordan, nine about Kuwait, nine about Lebanon, 35 about Palestine, two about Somalia, three about Sudan and one about Syria. A consistent finding was the significant positive association between the number of war traumata and the rates/severity of posttraumatic stress disorder (PTSD) symptoms, depression/depressive symptoms, behavioral problems, and other psychological symptoms. **Conclusion:** Wars have consistently and negatively impacted the mental health of children and adolescents in the Arab world. Mental health interventions are required for children and adolescents who have been exposed to war.

Keywords: War traumatic events, children, adolescents, mental health outcomes, Arab world

Declaration of interest: None

Introduction

Wars or armed conflicts have been common occurrences in the Arab world in recent history (post World War II). Several Arab countries were the scene for various wars, military invasions, civil wars, intense conflicts, and uprisings, some of which lasted for many years and some are still ongoing - the most enduring being the Israeli-Palestinian conflict. Consequently, millions of people were killed or injured and were forced to displace, with social structures tipping over and economies collapsing. It is hard to imagine that these upheavals would not have an impact on the mental health of the exposed populations.

Lately, findings from pertinent research in developed and developing countries revealed a strong association between exposure to traumatic events including war trauma during childhood and mental health problems at all life stages.^{1,2,3} The first national epidemiologic study from the Arab world examining a nationally representative sample of Lebanese adults found a robust association between war traumatic events experienced many years before and increased odds of having moderate to severe 12-month mental disorders. Many of the respondents surveyed in the study were children and adolescents during the Lebanon wars (1975-1990); exposure to war events predicted first onset of anxiety,

mood, and impulse control disorders, controlling for current age and gender.⁴

The current review aims to 1) report on the rates and severity levels of mental health outcomes in Arab children and adolescents, who experienced war events or armed conflicts, 2) look at gender and age differences in outcomes, 3) examine risk and protective factors, and 4) compare war-related mental health outcomes across the Arab world where this was studied.

Methods

A literature review up to September 15, 2014 was completed using Pubmed and PsychInfo. The search was not limited to any language. Search keywords included child/children, childhood, adolescent(s), adolescence, trauma, war, armed conflict, adversity/adversities. Countries or regions included in the search were Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Occupied Palestinian Territories, Gaza, West Bank, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen, Mauritania, Djibouti, Somalia, Arab, Middle East and Gulf. Possibly relevant articles were examined one at a time. Selecting primary original research studies only, a total of 67 articles were included in the review.

Mental health outcomes: rates and severity

The findings of the current review are presented in Table 1.

Iraq

Iraqi people have endured significant unrelenting military violence and political conflict during the past three decades, starting with the Iraq-Iran war (1980-1988) which resulted in more than a million deaths, then the Iraqi invasion of Kuwait in 1990 which led to the first Gulf war during which an international coalition led by the United States (US) forced Iraq to withdraw from Kuwait in February 1991. This was followed by Operation Desert Fox in 1998. In 2003, the US-led invasion ousted the government, and this was followed by violent armed conflict with and among different groups. During 2003-2010, fighting between US troops and insurgents, and sectarian violence resulted in tens of thousands of civilian fatalities. We found seven articles which reported on mental health outcomes in Iraqi children and adolescents who had experienced war events.

In a study conducted between 1991-1993, Ahmad, Mohamed, and Ameen (1998) assessed PTSD diagnosis, PTSD symptoms, and the course of PTSD symptoms in a sample of 20 Kurdish Iraqi children and adolescents aged 6-16 years who had been exposed to the mass-escape tragedy in 1991 following the Gulf war. Twenty percent of the sample had a PTSD diagnosis at baseline and two months after the disaster. None had PTSD diagnosis at four month post, but 23% and 18% had PTSD diagnosis at the 14-month and the 26-month follow-up assessments, respectively. Similarly, means of total PTSD symptoms and PTSD-specific symptom scores showed a significant decline at the four month follow-up, which was reversed at the 14-month follow-up and remained steady at the 26-month follow-up. The study findings paralleled a similar course of the prevailing political and socioeconomic situation in the region at the time. Girls and older adults had significantly more PTSD symptoms than did boys and younger ones only at baseline.⁵

In another study conducted in 1993, Ahmad, Sofi, Sundelin-Wahlsten, and von Knorring (2000) reported a PTSD rate (at the time of interview) of 87% in a random sample of 45 Kurdish Iraqi refugee (internally displaced) children and adolescents aged 7-17 years who had experienced five years earlier (in 1988) the Anfal military attack and subsequent traumatic experiences during captivity. Older subjects (> 13 years) were more likely to have PTSD diagnosis than younger ones (< 13 years).⁶

In a study conducted between 1991 and 1993, Dyregrov, Gjestad and Raundalen (2002) reported that 80% of a community-based sample of 94 children (aged 6-17 years), who had witnessed bombing of a shelter close to the area where they lived during the 1991 Gulf War, had frequent fear of losing their family two years after the war. A third of them had concentration problems. Probable PTSD at the time of interview was at 84% at baseline (six months after the war) and 78% two years after the war.⁷

In 2003, Dyregrov and Raundalen assessed psychological reactions among a sample of 232 Iraqi school children and adolescents, aged 10-16 years, who had been living amid an atmosphere of the threat of a possible war, malnourishment and difficult living conditions. The following rates at the time of interview were reported: depression (71%), fear of something bad happening to their family (70%), headaches (61%), attention and concentration difficulties (60%), felt that life was not worth living (57%), felt very lonely (50%), and sleeping difficulties (50%).⁸

In another study carried out in 2006 on 1,090 school adolescents from Mosul, 30% had PTSD symptoms. 32% of girls compared to 26% of boys had PTSD at the time of interview. PTSD prevalence was reported to be higher in older children. The same article reported findings from an additional study on primary school children (N=600, mean age=10.3) from Baghdad, 47% of whom were exposed to a major traumatic event in the previous two years; 14% of the sample had PTSD; 17% of girls versus 9% of boys had PTSD. PTSD and its symptoms were studied at the time of interview.⁹

In a study conducted between 2003 and 2004 on 3,079 children (age range=1-15years) enlisted from four primary health care centers in Mosul in Iraq, 10.5% had PTSD at the time of interview, which was rated as the most common mental disorder in the entire sample and all three age groups. PTSD rate did not vary by age. Significantly, more girls (13.8%) than boys (7.8%) had PTSD.¹⁰

Lokuge, Pintaldi, Thurber, Martinez-Viciano *et al.* (2013) studied, between 2009 and 2012, 1,676 Iraqis younger than 20 years of age and found that 38.2% had, at the time of interview, anxiety related complaints, 10.2% had mood-related complaints, 12.2% had behavior-related complaints (aggressive, impulsive, repetitive behavior etc.), and 39.5% had physical symptoms.¹¹

Jordan

Jordanians did not witness any specific war on their homeland in recent times. The only study from Jordan reported 30.8% rate of psychological distress (at the time of interview) in a sample of 146 Jordanian university students who had experienced displacement from Kuwait during the 1991 Gulf war 10 years earlier, compared to 22.4% among the non-exposed group after controlling for gender, perceived health status, and family income. The study was conducted in 2001 (ten years after exposure).¹²

Kuwait

In August 1990, Kuwait was invaded by Iraqi troops. US-led coalition forces from 34 nations backed by a UN resolution launched war against Iraq in January 1991. Kuwait was liberated in late February 1991. We could locate nine articles which reported on the mental health effects of war events exposure on Kuwaiti children and adolescents.

In a study conducted in the summer of 1991, nearly 70% of a pilot sample of 49 Kuwaiti school children aged 8-17 years who had “mid-range” war exposures showed moderate to severe PTSD symptoms, while 98% had some PTSD symptoms, three months post liberation of Kuwait. Grief symptoms were reported by 98% of the sample. Children with greater levels of total exposure experienced more PTSD and grief symptoms. PTSD symptom severity increased with age, controlling for level of exposure. Information on the time frame of PTSD (eg. in the past month/year) was not found.¹³

Among a sample of 1,981 Kuwaiti school children and adolescents aged 10-16 years who had witnessed atrocities during the Iraqi invasion, 3.7% of boys and 4.8% of girls had total scores on the Arabic Children’s Depression Inventory (at the time of interview) greater than two standard deviations (SDs) above the mean. Data collection took place two years after the Iraqi invasion (1992-1992). Boys had significantly higher mean total scores on the depression scale compared to girls.¹⁴

Al-Eissa (1995) examined immediate emotional, behavioral, and somatic problems in 106 Kuwaiti children (aged 7-14 years) who left the country to Saudi Arabia during the Iraqi invasion, and a comparable control of 120 Saudi children. Exposed Kuwaiti children had a two to six fold rate of affective, behavioral and somatic problems compared to the Saudi control (exposed vs. controls, respectively): emotional lability (67% vs. 21%), distractibility (41% vs. 12%), over-dependency (54% vs. 19%), difficulty sleeping (35% vs. 7%), and withdrawal (30% vs. 12%), to list some. Moreover, among exposed children, those with personal

experience of assault reported significantly higher prevalence of affective and behavioral symptoms compared to those without personal experience of assault. Boys had significantly more frequent behavioral problems (shouting, disruptive behavior, hostility, and nagging) than girls. Indifference, nagging, and possessiveness were more commonly reported among younger ones (7-10 years), whereas poor concentration, distractibility, unhappiness, defiance, and withdrawal were more common among older ones (11-14 years). Data collection took place in the early period of the Gulf crisis following the summer 1990 Iraqi invasion of Kuwait.¹⁵

In a sample of 322 Kuwaiti children aged 5-16 years who had witnessed various war trauma events during the Iraqi invasion to Kuwait, those who saw war trauma events had significantly more anxiety than those who heard about them. Girls revealed significantly more anxiety than boys.¹⁶

Hadi & Llabre (1998) assessed PTSD levels (at the time of interview) in a randomly selected representative sample of 233 Kuwaiti school children (age range=8-12 years) exposed to war events during the Iraqi occupation, one year post liberation (data collection between 1991 and 1992). Almost 62% of the sample had PTSD at the time of interview. PTSD levels did not vary by age.¹⁷

Awadb, Vance, El-Beblawi, & Pumariega (1998) reported a prevalence of PTSD symptoms at 65% in a randomly selected sample of 30 Kuwaiti children aged 10-12 years who were present in the country throughout the Iraqi occupation. Among PTSD cases, 60% showed symptoms overlapping with depression, anxiety, and hyperactivity. These effects were reported to be persistent and steady over five years. Girls had higher PTSD prevalence than boys after five years of baseline assessment. Data collection was founded during the first phase in 1991; the second phase was undertaken in 1996.¹⁸

Two studies^{19, 20} examined prospectively a sample of 84 Kuwaiti school children (aged 9-12 years at study onset, two years after the war ended) who had their fathers either killed, missing or arrested during the Iraqi occupation. Data collection was two years after the Gulf war: 1993, second data collection: 2003, and mental health outcomes were assessed at the time of interview. The highest levels of depression at baseline were reported among children who had their fathers killed, while those who had their fathers arrested had the highest levels of PTSD symptoms, depression, and anxiety after 10 years of initial assessment. PTSD symptoms and anxiety increased over time among all exposed children, in addition, to becoming at a higher risk of developing

heart disease, hypertension, diabetes, or high cholesterol after 10 years, compared to non-exposed children (diagnosis based on self-report). Some PTSD symptoms, depression, and anxiety levels did not differ by gender when first surveyed shortly after exposure, and 10 years after first assessment, controlling for war experience.

In a study published in 2008 by Al-Turkait & Ohaeri, in a random sample of 355 children (aged 6-16 years) of Kuwaiti military men who had had varying levels of war trauma exposure during the Gulf war, 14.4% had depression, 14.9% anxiety, and 16.1% aggression at the time of interview. Data collection took place in 1997 (six years after the war), and mental health outcomes were studied at the time of interview. Prevalence of behavioral problems varied from 16.9% for neurotic behavior to 17.1% for antisocial behavior, whereas problems in adaptational behavior varied between 16.6% for deficient prosocial behavior to 19.7% for deficient playful behavior. Comorbidity of depression and anxiety among the sample was common in more than 50% of cases.²¹

Lebanon

Lebanese children and adolescents lived through many wars in recent history, most enduring are the protracted Lebanon wars (1975-1990), and the two subsequent Israeli operations "Operation Grapes of Wrath" in 1996 and what has come to be known as the "July War" in 2006. We retrieved nine original articles which reported on mental health outcomes among samples of Lebanese children and adolescents who had experienced war events.

Saigh (1985) assessed anxiety levels among a sample of 62 Lebanese high school students in Beirut (mean age=15.1 years) one month before and six months after the Israeli invasion of Lebanon in 1982. There were no statistically significant differences in anxiety levels pre-versus post-invasion [as determined by mean Fear Survey Schedule (FSS) and State Trait Anxiety Inventory (STAI) scores]. On the contrary, anxiety levels were significantly lower after the invasion as determined by mean Lebanese Fear Inventory (LFI) scores. It was hypothesized that these numbers are explained by the fact that the Lebanese government regained authority in West Beirut where the study was conducted numbered people.²²

In another study conducted amid the Israeli invasion and siege of West Beirut during summer 1982, Hourani, Armenian, Zurayk, & Afifi (1986) reported prevalence rate of psychological distress (at the time of interview) at 7.4% among a sample of 2,958 Lebanese children and

adolescents ≤ 19 years old. Those who were displaced before the war had the highest number of reported psychological distress symptoms compared to those who were never displaced, or were displaced into relatives' or friends' homes or refugee centers.²³

In a study conducted in 1985 on a sample of 1,039 Lebanese school children (age range=3-9 years) who had been repeatedly exposed to war (heavy fighting or shelling), besides possible exposure to personal war traumas, the most frequently reported behavioral and emotional problems, at the time of interview, were: over-dependency (88%), physical symptoms (paleness, vomiting, trembling, headache, and diarrhea) (71%), crying easily (66%), shouting and screaming (62%), and hyperactivity (61%), to list some. Almost all emotional and behavioral problems were significantly 1.7 times more common among traumatized children (those who had experienced one or more personal war traumas such as death of a family member, destruction of home, forced displacement of the family, and witnessing death) compared to non-traumatized ones.²⁴

Levels of anxiety, depression, and conduct problems (as determined by mean scores using RCMAS, CDI, and CTRS at the time of interview) were significantly greater among a sample of 230 Lebanese children aged 9-13 years who were exposed to different war traumas and had PTSD diagnosis, compared to non-exposed non-PTSD control group; yet they did not differ significantly by type of war trauma among exposed PTSD children. Data collection took place in 1987.²⁵

In another study (data collection: 1990-1991) on Lebanese preschool children (N=100, aged 3-6 years) those who had experienced heavy shelling in 1989 had significantly more behavioral problems and higher intensity scores at the time of interview than non-exposed ones, after two years of exposure. In particular, rates of four behavioral problems were significantly higher among exposed preschoolers than non-exposed ones: refusal to go to sleep alone (72% vs. 46%), over-dependency on parents (44% vs. 28%), excessive thumb-sucking (64% vs. 39%), and nightmares (25% vs. 16%).²⁶

Karam *et al.* (2007) conducted a study to assess psychological and PTSD symptoms among a random sample of Lebanese school children and adolescents who were most exposed to the July 2006 Israel War in Lebanon. Data collection took place six months after the July 2006 war. The most frequent problems among those aged 8-11 years (N=261) were hyperactivity, inattention, lack of discipline, and lack of motivation to study. Nearly 50% of the adolescents (N=709) reported psychological symptoms the onset of which began after

the July 2006 war-among them 14.5% of the total adolescent sample were at high-moderate probability of having a mental disorder, compared to 4.2% before the war. Significantly, more girls (19.3%) than boys (6.8%) were rated high risk for psychological symptoms on the SDQ after the war. 15.4% of adolescents were likely to have PTSD by scoring above the cut-off of the Child-Revised Impact of Grants Scale. Most frequently reported PTSD symptoms were irritability (31.2%), trying not to remember war events (28.0%), trying to avoid reminders of the war (26.3%), and startling more easily (25.6%). Other problems that were reported among exposed adolescents were hyperactivity, extreme academic delays, inattention and distractibility, and conduct problems.²⁷

In a second study (data collection: 1996-1997), Karam *et al.* (2008b) reported rates of major depressive disorder (MDD), separation anxiety disorder (SAD), and PTSD at 26.9%, 17.2%, and 31.2%, respectively, at baseline and at the time of the interview (one month after the 1996 war), in a randomly selected sample of 93 Lebanese school children from the South, aged 6-18 years, representing 2,500 students from six of the most heavily affected villages in the South following the Grapes of Wrath War in 1996. At one-year follow-up, rates of MDD, SAD, and PTSD dropped to 8.6%, 6.4%, and 2.2%, respectively.²⁸

In a study published in 2011, El Zein & Ammar reported significantly higher anxiety levels (as determined by scores on the State-Trait Anxiety Inventory, at the time of interview) among a community based sample of 110 children (9-12 years old) from South of Lebanon who were directly exposed to bombardment during the July 2006 war, compared to a control group of 105 children who were not directly exposed. Anxiety levels did not differ significantly by gender.²⁹

Karam *et al.* (2014) also studied 386 children and adolescents from war exposed regions in Lebanon (South Lebanon and Southwest Bekaa) three weeks after war exposure (Phase 1: May, 1996) and then investigated a random subsample (n=143) a year later (Phase 2: May, 1997). In Phase 1, the rates of disorders in the subsample (n=143) in the past month was 25.9% for MDD, 16.1% for SAD, 28.0% for overanxious disorder (OAD), and 26.0% for PTSD, with 44.1% having any disorder. At Phase 2, the rates were 5.6% for MDD, 4.2% for SAD, 0% for OAD, and 1.4% for PTSD, with 9.2% having any disorder. Of those with a Phase 1 disorder, 17.4% still had a disorder at Phase 2. Witnessing any war event was significantly associated with having a mental disorder at Phase 1 (OR: 3.9), as well as the persistence of the disorder until Phase 2 (OR: 14.3) in multi-logistic

regression models controlling for age, pre-war disorder and other stressors.³⁰

Palestine

The Palestinians are the most exposed in modern times to war and for more than six decades. Thirty-five studies assessed mental health outcomes of war and military violence traumatic exposures in Palestinian children and adolescents, and four of those attempted to look into mental health variables at several time points.

The earliest conducted study by Punamäki & Suleiman (1990) assessed psychological symptoms among Palestinian children (age range=8-14; N=66) who had lived under military occupation and had experienced many political hardships. Data was collected in 1982. The study revealed that the more children were exposed to political hardships, the more they had aggression, nervousness and “withdrawal” symptoms.³¹

Several studies were published assessing mental health outcomes in young Palestinians exposed to military violence in the context of the first Intifada in 1987.

In a sample of 796 Palestinian children from the West bank and Gaza (age range=6-15 years) who had experienced military violence for two years during the first Intifada, rates of problems (at the time of interview) that were reported with statistical significance were: fear of soldiers (46.7%), fear of leaving the house (27.8%), and depression (11.3%). Fears were more prevalent among younger ones (6-8 years) and girls. Data was gathered during a two-month period in the summer of 1989. The rate of depression (at the time of interview) was significantly higher in girls than boys.³²

Kostelny & Garbarino (1994) found out in a study on a convenient sample of 40 Palestinian children from the West Bank that among the younger ones (5-8 years), 40% showed behavioral problems and personality changes (sleep disturbances, bedwetting, anxiety, and “withdrawal” symptoms), 35% had fears of going to school, and 30% would cry and scream when they saw soldiers. Data was collected in December 1989. On the other hand, 20% showed disobedience to authority figures, 15% were more aggressive, and 15% showed more anxiety and nervousness among the older ones (12-15 years).³³

In another sample of 150 children from the West Bank, 20.6% showed behavioral problems of clinical significance. Boys and younger ones (6-9 years) showed significantly more behavioral problems than girls and older ones (12-15 years) under conditions of high accumulated military and family violence risk. Data was collected in September 1990.³⁴

In a representative sample of 7,000 Palestinian school adolescents aged 14-15 years, participation and victimization experienced during the first Intifada predicted increases in depression and antisocial behavior, but not in aggression, one to two years after the end of the Intifada. Data was collected in 1994 and 1995.³⁵

A survey between January and April 1996, Miller, El-Masri, Allodi, & Qouta (1999) assessed rates of behavioral and emotional problems in a random sample of 669 Palestinian school children aged 6 years and up as a function of lifetime exposure to war trauma. Among children aged 6-11 years, 10.0% were reported to have ADHD, 14.4 % conduct disorder, 46.7% emotional disorder, and 50.9% one or more behavioral or emotional disorders at the time of interview. Rate of conduct disorder was significantly higher among boys (22.9%) than girls (7.3%). In adolescents (aged 12 and up), 11.8% were reported to have ADHD, 12.3% conduct disorder, 28.0% emotional disorder, and 35.5% one or more behavioral or emotional disorders. 39.5% had moderate to severe PTSD. Prevalence rates of moderate-severe PTSD levels were significantly higher among adolescent girls (47.3%) than boys (30.0%). On the contrary, prevalence rates of conduct disorder were 16.7% and 8.3%, while that of ADHD were 16.7% and 7.3%, among boys and girls, respectively.³⁶

In a study on a representative sample of 234 Palestinian school children aged 6-11 years from Gaza, 72.8% reported PTSD reactions of at least mild severity, 40.6% had moderate to severe PTSD reactions, while 26.9% showed emotional and behavioral problems as per parents' reports versus 43.6% as per teachers' reports at initial assessment (six months post first Intifada). Data collection took place in 1993. At one-year post initial assessment, almost all mental health outcomes showed statistically significant improvement: Only 10.0% reported moderate to severe PTSD reactions, 20.9% had emotional and behavioral problems as per parents' reports versus 31.8% as per teachers' reports.^{37,38}

Punamäki, Qouta, & El Sarraj (1997), Punamäki, Qouta, & El-Sarraj (2001), Qouta, El-Sarraj, & Punamaki (2001) and Qouta, Punamäki, Montgomery, & El Sarraj (2007) looked at PTSD symptoms, neurotic symptoms, emotional problems, self-esteem, resilient attitudes and satisfaction with quality of life in a community-based sample of 84 children (10-12 years old at baseline assessment), who had experienced intense military trauma events during the first Intifada, shortly before the end of the Intifada (1993), after three years (1996), and after seven years (2000, just before beginning of the second Intifada). Exposure to intense military traumatic events during the Intifada significantly associated with

neurotic symptoms and low self-esteem at baseline, and with PTSD symptoms after three years. Girls showed more neurotic symptoms and boys had more emotional problems; yet they did not differ in PTSD levels, three years after baseline assessment. Older ones showed more PTSD symptoms when examined after three years of baseline assessment compared to younger ones. When examined seven years after exposure, PTSD and depressive symptoms were significantly positively correlated, and were both negatively correlated with resilient attitudes and satisfaction with quality of life. Exposure to military trauma at the age of 10-11 years, and subsequent stressful life events in early adolescence, increased the risk for PTSD and depressive symptoms and decreased satisfaction with quality of life in late adolescence. Emotional problems were studied over past six months, whereas the remaining mental health outcomes were assessed at the time of the interview.^{39,40,41,42}

During a relatively calm period (summer 2000), Zakrison, Shahan, Mortaja, & Hamel (2004) reported an overall rate of psychological morbidity (behavioral and emotional problems) at 42.3% in a sample of 206 Palestinian children aged 6-13 years from the West Bank. Boys had significantly higher prevalence of psychological morbidity (46.3%) compared to girls (37.8%).⁴³ In a study conducted in 1999 on a representative sample of 1,000 Palestinian school adolescents aged 12-16 years from the West Bank, among those who had experienced traumatic events (political violence and others), 62.3% had PTSD diagnosis. PTSD prevalence rates were higher among older adolescents controlling for other variables.⁴⁴

The majority of published studies on children and adolescents from Palestine examined the impact of exposure to war traumatic events during the second Intifada. During the first few months of the second Intifada, Thabet, Abed, and Vostanis (2001) examined DSM-IV PTSD reactions in a random sample of 286 Palestinian children aged 9-18 years from Gaza; 34.3% of children met criteria for PTSD. Prevalence rates of the most common PTSD symptoms were: had waves of strong feelings about the event (49.0%), being distressed when thinking about the event (40.9%) and reminders of the event (40.9%). Girls had significantly higher total IES scores (and higher intrusion scores) compared to boys, though boys had significantly higher exposure levels. IES scores did not vary by age.⁴⁵

Thabet, Abed, & Vostanis (2002) reported a prevalence of 59% severe-very severe PTSD among a community-based sample of 91 Palestinian children from Gaza aged 9-18 years who had been exposed directly to home

bombardment and demolition of their houses, compared to 25% among an equivalent age group of 89 who had not been exposed to home bombardment yet experienced other war traumatic events (such as witnessing bombardment by helicopters, seeing mutilated bodies on TV, etc.). Data was collected during the second Intifada. Most commonly reported PTSD symptoms in exposed children were concentration difficulty (58%), sleep disturbance (57%), and avoidance of reminders (52%). Child's age did not predict PTSD severity. On the other hand, children exposed to helicopter bombardments and mutilated bodies on TV reported higher prevalence of anxiety symptoms (39%) compared to exposed children (22%).⁴⁶

Mean PTSD and depression levels, assessed using Child PTSD Reaction Index (CPTSD-RI) and Children's Depression Index (CDI), respectively; fell within the moderate range in a sample of 140 children aged 6-16 years from the West Bank who lived in areas that had been exposed to intense bombardment within a six-week period during the second Intifada. Data was gathered between March - May 2002. Mean self-esteem levels, examined using The Cooper Smith Self-Esteem Inventory, did not fall below normal.⁴⁷

In a community-based sample of 121 Palestinian refugee children from Gaza aged 6-16 years who had been exposed to different types of war traumatic events during the second Intifada, almost all children (98.3%) reported some PTSD symptoms. Two psychologists approached the families in their homes or tents in January and February 2002. While child's age did not predict PTSD severity, girls had significantly more PTSD symptoms, particularly more intrusion symptoms than boys.⁴⁸ As to psychological distress and psychosomatic symptoms, 80.5% had worries, 61.9% were socially isolated, 52.1% had concentration difficulties, 49.2% had headaches, and 46.7% had fears, to list some. Significantly more boys than girls were reported to show "behavioral" problems under conditions of high war traumatic events exposure. Data was collected during Autumn 2001.⁴⁹

Looking at a representative sample of 403 Palestinian refugee children from Gaza, aged 9-15 years, who had been exposed to intense military violence for six months since the onset of the second Intifada, Thabet, Abed, & Vostanis (2004) reported moderate to severe PTSD symptoms at 75.5%. Data was collected between June and July 2001. Prevalence rates of frequent PTSD symptoms (at the time of the interview) among the sample were: concentration difficulties (41.9%), avoidance of reminders (37.5%), feeling upset when thinking about the event (37.5%), and intrusive images and sounds (32.0%). PTSD symptoms severity increased significantly with age. Prevalence rates of commonly

reported depression symptoms were: crying a lot (25.6%), "feeling tired and doing nothing" (22.1%), feeling lonely (18.4%), and feeling unhappy or sad (13.9%). Depressive symptoms did not vary with age or gender. PTSD and depressive symptoms were significantly positively related.⁵⁰

In 2003, Qouta & Odeh (2005) measured PTSD severity levels as a function of lifetime exposure to war traumatic events in a community-based sample of 944 children from Gaza aged 10-19 years. Overall 82% of the sample had moderate-severe levels of PTSD symptoms anthology, at the time of the interview. Children who had been living in areas of intense military violence were most likely to report severe PTSD symptoms.⁵¹

In 2006, Thabet, Karim, & Vostanis reported on behavioral and emotional problems in a representative sample of 308 preschool children, aged 3-6 years, selected from kindergartens in Gaza, who had been exposed to war traumatic events during the second Intifada. Data collection occurred between December 2002 and February 2003. Behavioral problems, at the time of interview, that were significantly evident among exposed preschoolers were faddy eating (36.6%), difficulty settling at night (29.1%), over-activity (25.2%), dependency (24.6%), and worries (16.5%), to list some. Boys had significantly higher scores than girls on the Strengths and Difficulties Questionnaire (SDQ) hyperactivity subscale; yet genders did not differ on the SDQ total score.⁵²

Five articles reported on mental health problems exclusively in school adolescents, who had been exposed to intense military violence during the second Intifada.

Among a representative sample of 229 school adolescents living in refugee camps in Gaza, aged 15-19 years, who had been heavily exposed to Intifada-related military violence for almost two years, almost 69% of the sample had PTSD, 40.0% moderate-severe depression levels, and 95% severe anxiety levels at the time of interview. Data was collected in 2002. Prevalence rates of depression and anxiety did not vary between genders. Nearly 70% of the sample reported "undesirable" coping responses.⁵³

Prevalence of depressive-like states during the past year was reported at 6.5%- 14.9% in a representative sample of 3,415 school adolescents aged 15-18 years from the West bank during a period of military occupation and intensified conflict (mid 2003). Data was collected between May and June, 2003. Significantly, more girls (8.2%) had depressive-like states than boys (4.6%). Each of individual and collective exposures to violence independently related significantly with adolescents' depressive-like states, after controlling for gender, age,

and place of residence.⁵⁴ Moreover, those who were exposed to war trauma at least once during the past year reported high levels of subjective health complaints (SHC) (four or more per week) compared to those who were never exposed. Exposure to humiliation was significantly positively associated with a high number of SHC: 52 % and 62% of students, who had experienced three or four forms of humiliation respectively, reported high levels of SHC compared to 21% of students who were never exposed to humiliation⁵⁵

In a representative national sample of 2,100 Palestinian high school students aged 14-17 years who had been exposed to war-like traumatic events prevalence rates for full and partial PTSD (at the time of the interview) were 35.6% and 11.6%, respectively. Adolescents who reported full PTSD symptoms were more likely to report more functional impairment and somatic complaints than those not having PTSD symptoms; 90% of the sample reported severe-moderate symptoms of hopelessness. Data was collected during the academic year of 2004-2005.⁵⁶

In 2003, rates of PTSD symptoms at the time of interview in a sample of 412 school adolescents from Gaza (aged 12-16 years) who had been exposed to Intifada-related violence for two years was: intrusive recollections (81.6%), distressing dreams (80.8%), being upset by reminders of the event (79.6%), exaggerated startle (64.8%), and psychic numbing (46.6%); 30.8% of the sample had PTSD. Whereas PTSD symptoms increased with female gender, neither PTSD symptoms number nor prevalence of PTSD diagnosis varied by age.⁵⁷

Further studies examined mental health outcomes as a function of exposure to military violent traumatic events in Palestinian children and adolescents.

Khamis (2008) assessed prevalence of PTSD, depression, and anxiety in a sample of 179 Palestinian adolescent boys aged 12-18 years who developed permanent physical disabilities as a result of injury during the second Intifada. About 76.5% of the sample had PTSD diagnosis after injury with live ammunition. 29.9% had delayed onset of symptoms (more than six months after the injury). Adolescents who had PTSD symptoms were significantly more likely to report higher levels of depression and anxiety compared to non-PTSD adolescents.⁵⁸

In a convenient sample of 197 children (age range=9-18 years) who had been exposed to regular shelling in Gaza for six months the most common symptoms endorsed on the Child-Revised Impact of Events Scale (CRIES) were insomnia (40.5%), exaggerated startle (39%), and trying

to remove memories from their mind (39%); 70.1% of the sample this had PTSD diagnosis using a structural clinical interview based on the CRIES and 33.9% had anxiety symptoms. Broad mental health morbidity, as determined by the SDQ-total difficulties scores, was reported at 42.7%, peer relationship problems at 60.1%, conduct problems at 36.8%, emotional problems at 24.4%, and hyperactivity at 22.8%. Prevalence rates of PTSD and anxiety symptoms (at the time of interview) increased significantly with age. The data was collected during June 2006.⁵⁹

Espié, *et al.* (2009) looked at prevalence of psychiatric disorders among a clinical sample of 619 Palestinian children ≤ 15 years old who were helped by Médecins Sans Frontières (MSF) program from 2005 to 2008, and had been exposed to lifetime traumatic events, including war events. At the time of interview, 25.8% had PTSD while 18.3% had anxiety disorders (other than PTSD and acute stress disorder). Neither PTSD symptoms nor PTSD symptoms' severity differed by child age (≤ 12 years old compared to adolescents). Genders did not differ in severity of anxiety symptoms.⁶⁰

During a "calm" period in 2007, Massad *et al.* (2009) collected data on behavioral and emotional problems, hyperactivity and peer relationship problems in preschoolers (N=350, aged 3-6 years) kindergarten-based in Gaza who had experienced several war traumatic events during the past year (last few months of the second Intifada); 29% of the sample had poor mental health (defined as total difficulties scores on the SDQ ≥ 17). At the time of interview, the prevalence of conduct problems was 52%, emotional problems 19%, peer relationship problems 17% and hyperactivity 3%. Boys had higher scores on measures of total emotional and behavioral problems than girls. In addition, almost 65% of the sample had "severely impaired" overall health-related quality of life (HRQOL), particularly in the domains of emotional functioning and psychosocial health.^{61,62}

In a unique study, Dubow *et al.* (2010) measured PTSD symptomology and aggressive behavior among a community-based representative sample of 600 Palestinian children and adolescents (200 in each of three age groups: 8, 11, and 14 years) as a function of exposure to ethnic-political conflict and violence besides exposure to conflict and violence in other contexts (family, community, school) in the past year. During the past month, 33.3% of the children indicated moderate to high frequency of PTSD symptomology, which did not differ by age. No date of data collection was mentioned. Prevalence rates of aggressive behavior, in the past year, varied between 22% and 33%. Boys and older ones (11-

and 14-year-olds) displayed significantly higher levels of aggression than girls and younger ones (8-years-old). Exposure to political, school, and family conflict/violence independently predicted PTSS, whereas community violence did not. On the other hand, exposure to political and community conflict/violence made unique contributions to predicting aggressive behavior, whereas school and family violence had no independent effects. None of the exposures to violence in any of the other contexts moderated the effect of exposure to ethnic and political violence on PTSS and aggressive behavior.⁶³

Punamäki, Qouta, Miller, & El-Sarraj (2011) studied resilience among a random sample of 640 school children from Gaza (age range=6-16 years) as a function of lifetime exposure to war events, using data from the Gaza Child Health Survey (GCHS) conducted in 1996. Of the sampled children, 21% were found to be resilient: did not show any of three psychiatric disorders [emotional disorder, conduct disorder, and attention deficit hyperactivity disorder (ADHD)] despite high level of war events exposure (6-18 events); 23% were traumatized: experienced high level of war traumas and had one to three of psychiatric disorders; 23% were vulnerable: had low level of war events exposure (two to five events) and showed one to three of psychiatric disorders; and 33% were spared from both trauma and psychological disorders. Although genders did not differ in war trauma exposure and were equally traumatized, significantly fewer girls (19.0%) than boys (23.5%) were resilient.⁶⁴

Kolltveit *et al.* (2012) studied a random sample of 139 school students aged 12-17 in Gaza. Data was collected ten months after the end of the November 2009 war. In the sample, 56.8% scored within the clinical range of the Revised Child Impact of Event Scale (CRIS-8) scale which assessed PTSD at the time of the interview. Moreover, 23.7% and 41.2% of the sample respectively scored above the clinical cut-offs for anxiety at the time of the interview (Revised Children's Manifest anxiety Scale: RCMAAS) and depression at the time of the interview (Depression Self-Rating Scale for Children: DSRS) scales. Lastly, war exposure was significantly associated with higher scores on the PTSD and anxiety scales, but not the depression one.⁶⁵

Somalia

Two publications examined mental health outcomes in Somali refugee adolescents who had resettled in the US.

Exposure to lifetime war adversities was a significant predictor of PTSD and depression symptoms' severity, more so of PTSD symptoms, in a community-based sample of 76 Somali adolescent refugees aged 12-19

years who have resettled in the US. Depressive symptoms did not show any significant relation with gender (66). Again, in another sample of 135 resettled Somali adolescent refugees, the most significant predictors of PTSD and depression symptom severity were lifetime trauma exposure and perceived discrimination, respectively. Other significant predictors of PTSD symptom severity were: post-war life adversities, acculturative stress, and perceived discrimination; whereas predictors of depression symptom severity were lifetime trauma exposure, and recency of resettlement in the US.⁶⁷

Sudan

Soon after independence, civil war broke out in the South of Sudan lasting for many years (1962-1972, 1983-2002); this ended lately with South Sudan gaining independence in July 2011. The region of Darfur was the scene of intense fighting from 2003 until 2010.

All three studies that we came across on mental health consequences of war on Sudanese children reported findings from samples of refugee children who had experienced a variety of traumatic events secondary to war trauma exposure and their displacement/flight.

Looking at a random sample of 316 Sudanese war refugee children aged 7-12 years who fled to Uganda during a three month period in 1995-1996, Paardekooper, de Jong, & Hermanns, (1999) found war refugee children had significantly more PTSD symptomology, behavioral problems, and depressive symptoms, compared to a group of Ugandan children with similar sociodemographic characteristics yet not exposed to war events. Data collection took place November 1995-January 1996). Refugee children had significantly more frequent headaches and nervousness; they exhibited more frequent aggressive and risk-taking behaviors, and delays in cognitive development, as reported by their parents. Children themselves reported significantly more frequent psychosomatic complaints, sleep problems (nightmares, difficulties sleeping), memories of traumatic experiences, worries about the future, becoming easily startled, irritated and angry, and having suicidal thoughts, compared to the non-exposed group.⁶⁸

At the time of interview, PTSD prevalence was reported at 20% in a convenient sample of 304 Sudanese war refugee minors (mean age=17.6 years) one to one and a half years after settling in the US. Children with PTSD reported significantly deteriorated health-related quality of life compared to those without PTSD. Besides, direct personal war experiences (being injured or tortured), separation from immediate family, and variables pertaining to current living situation and experiences after resettlement in the US were found to predict PTSD.

Data was collected from February 2002 through July 2002.⁶⁹

Morgos, Worden, & Gupta (2008) reported prevalence of PTSD symptoms (at the time of interview) at 75%, depressive symptoms at 38%, and grief symptoms at 16% in a randomly selected sample of 331 Sudanese refugee children, aged 6-17 years, representative of the internally displaced school-based children population from different villages in Southern Darfur, and living in refugee camps. Prevalence rates of PTSD symptoms and depression did not differ by age, but the rate of depression symptoms varied from 55% in girls to 25% in boys. The date of data collection was not mentioned.⁷⁰

Syria

A literature search as of September 2014 did not reveal any published papers on mental health outcomes of war traumatized child populations in Syria. However, we have undertaken at IDRAAC a survey of public schools in Lebanon that were attended by Syrian refugee children and adolescents (Karam *et al.*, manuscript in preparation). A total of 547 Syrian refugee children and adolescents (mean age 11.9 yrs (± 1.6)) were surveyed. Children were exposed to a mean of 4.5 (± 5.2) war events. The most common events were destruction of homes of people they know (48.4%), unable to leave home because of bullets or bombing (37.0%), having a close person get injured because of the war (32.9%), seeing an injured person (not on TV) (32.7%), witnessing explosions (28.6%) and having a close person get killed (27.6%); 16.8% scored above 20 on the Child Depression Inventory, 56% above 30 on the Screen for Anxiety Related Disorders-Child Version and 4.7% scored above 38 on the PTSD Reaction Index. Moreover, a variety of childhood adversities were also measured, and the results will investigate the interplay of war trauma and concurrent childhood adversities in predicting mental disorders.

Discussion

Despite using two of the main and widely utilized search engines (PubMed and PsycInfo), some primary research studies published in journals not indexed in the used search engines might have been missed.

The following Arab countries exposed to war/military violence/armed conflict were covered: Iraq, Kuwait, Lebanon, Palestine, Somalia and Sudan. The majority of published studies examined Palestinian samples (35 articles/31 samples), followed by Kuwaiti (9 articles/ 8 samples) and Lebanese (9 articles/ 11 samples), Iraqis (7 articles/ 7 samples), Somalis (2 articles/ 2 samples),

Sudanese (3 articles/ 3 samples) and one paper from Jordan. Papers from Syria are beginning to emerge. Almost all assessed samples were community-based (selected from general population/, or school-based exposed to war events). A few studies (7 out of 59) measured mental health outcomes in exposed and non-exposed/ control groups. Only eight out of 62 samples were assessed longitudinally. Sample sizes (N) varied largely between studies: Iraqi samples (20-3,079), Kuwaitis (30-1,981), Lebanese (62-2,958), Palestinian (40-7,000), Somalis (76-135), and Sudanese (304-331). Additionally, sample sizes varied as per study design - among longitudinal studies (N: 20-234), whereas in cross-sectional studies (N: 40-7, 0003).

Any comparison of findings across Arab countries is obviously met with several hurdles, among them the inherent differences in the type, severity, and the meaning associated with armed conflict occurring in each country or even sometimes within the same country, methodologies, and instruments used to assess exposure and outcomes, etc. (see later section on limitations of studies conducted in the Arab world).

Mental health outcomes associated with war trauma exposure

Mental health outcomes that were examined most commonly included PTSD/PTSS prevalence and severity, followed by behavioral/psychological distress/psychological morbidity, then depression and anxiety symptoms and/or emotional problems.

Prevalence of PTSD symptomology varied among samples: highest among Palestinian samples (rates varied between 34.3%-98.3% during periods of intense military violence, 62.3% - 87.4% during relatively calm periods), followed by Sudanese samples (75% among refugee sample of the internally displaced children population), and Kuwaiti samples (62%-65%). Lower prevalence rates were reported among Lebanese samples (15.4%-31.2%) and Iraqi samples (10.5%-30%).

While a range of emotional and behavioral problems were looked at; nevertheless, cross-country assessment could not be performed effectively since different emotional and behavioral problems were measured. Prevalence of overall emotional and behavioral problems/psychological morbidity varied from 26.9%-50.9% in Palestinian samples, compared to 50% in a Lebanese sample. Prevalence rates of commonly reported emotional and behavioral problems varied as such: depression/depressive symptoms varied from 11.3%-40.0% in Palestinian samples, 38% in a Sudanese sample, 26.9% in a Lebanese sample, and 14.4% in a Kuwaiti sample; anxiety problems differed from 15%-

39% in Palestinian samples, 17.2% in a Lebanese sample, and 14.9% in a Kuwaiti sample; and aggressive behavior varied from 15%-45.8% in Palestinian samples compared to 16.1% in a Kuwaiti sample.

Risk factors

Child age

Older children showed more PTSD symptomology/PTSD prevalence rates, PTSD levels/and more PTSD severity, than younger ones in 10 samples (Ahmad *et al.*, 2000; Ahmad *et al.*, 1998; Dyregrov *et al.*, 2002; Khamis, 2005; Morgos *et al.*, 2008; Nader *et al.*, 1993; Qouta *et al.*, 2001; Razokhi *et al.*, 2006; Thabet *et al.*, 2004; Thabet *et al.*, 2008), but they did not differ from younger ones in another nine samples (Al-Jawadi & Abdul-Rhman, 2007; Dubow, *et al.*, 2010; Espié, *et al.*, 2009; Hadi & Llabre, 1998; Qouta *et al.*, 2003; Thabet *et al.*, 2001; Thabet *et al.*, 2002; Thabet *et al.*, 2009). Besides, although older ones had significantly more PTSD symptomology than younger ones at baseline assessment; yet they showed more decline of symptoms after two years of exposure than younger ones, thought to be due to more effective coping/use of external resources (Ahmad *et al.*, 1998; Dyregrov *et al.*, 2002).

Younger children on the other hand had more fears, hyperactivity, conduct problems, and psychosomatic symptoms than older ones (Al-Eissa, 1995; Baker, 1990; Garbarino & Kostelny, 1996; Kostelny & Garbarino, 1994; Massad *et al.*, 2009; Qouta *et al.*, 2005).

Child gender

Whereas no significant gender differences in full PTSD symptomology prevalence rate or severity were reported in 16 samples (Abdeen *et al.*, 2008; Dubow *et al.*, 2010; Elbedour *et al.*, 2007; Espié *et al.*, 2009; Thabet & Vostanis, 1999; Thabet *et al.*, 2002, 2004, 2008, 2009; Hadi & Llabre, 1998; Hadi *et al.*, 2006; Nader *et al.*, 1993; Kia-Keating & Ellis, 2007; Morgos *et al.*, 2008); girls had significantly higher PTSD prevalence, severity, and/or more symptoms than boys in eight samples (Ahmad *et al.*, 1998; Al-Jawadi & Abdul-Rhman, 2007; Miller *et al.*, 1999; Qouta *et al.*, 2003; Razokhi *et al.*, 2006; Thabet *et al.*, 2001; Thabet *et al.*, 2009). It is noteworthy that in nearly all Iraqi samples, PTSD prevalence was significantly higher in girls than boys (1.2-1.9 times).

Gender differences in depression/depressive symptoms were inconsistent. Genders did not differ in prevalence

rate or severity of depression or depressive symptoms in four samples (Elbedour *et al.*, 2007; Hadi *et al.*, 2006; Kia-Keating & Ellis, 2007; Thabet *et al.*, 2004). However, girls had significantly higher prevalence rates of depression/depressive symptoms (1.8-2.2 times) compared to boys in three samples (Baker, 1990; Giacaman *et al.*, 2007; Morgos *et al.*, 2008). On the contrary, boys reported more depressive symptoms than girls in two samples (Abdullatif, 1995).

Gender variations in general psychological distress/symptoms (measures of overall emotional and behavioral problems) were also inconsistent. Boys had significantly higher prevalence/or severity levels than girls in two samples (Massad *et al.*, 2009; Zakrison *et al.*, 2004). Girls were at a higher risk for total emotional and behavioral problems in one sample (Karam *et al.*, 2007). Genders did not differ on measures of psychological distress in two samples (Thabet *et al.*, 2006).

Boys had significantly more behavioral problems (Al-Eissa, 1995; Garbarino & Kostelny, 1996; Punamäki, *et al.* 2011; Qouta *et al.*, 2005), higher prevalence rates of conduct disorder and ADHD (Miller *et al.*, 1999), and higher levels of hyperactivity (Thabet *et al.*, 2006), than girls.

It is worth mentioning that two independent variables, namely the level of accumulated military and family violence risk and war trauma exposure level, had interaction effects with gender and age in affecting mental health outcomes (Garbarino & Kostelny, 1996; Qouta *et al.*, 2005).

War trauma exposure

Regarding war variables, findings corroborate the prevalence of a significant positive association between number of war events experiences/ exposure level, and prevalence and severity of PTSD symptoms (Abdeen *et al.*, 2008; Ahmad *et al.*, 2000; Hadi & Llabre, 1998; Karam *et al.*, 2007; Morgos *et al.*, 2008; Nader *et al.*, 1993; Punamäki, Qouta, & El-Sarraj, 2001; Thabet & Vostanis, 1999; Thabet & Vostanis, 2000; Thabet *et al.*, 2004; Thabet *et al.*, 2008; Thabet *et al.*, 2009), depression/depressive symptoms (Morgos *et al.*, 2008; Thabet *et al.*, 2004), behavioral problems (Miller *et al.*, 1999), and other psychological symptoms (Karam *et al.*, 2007; Qouta *et al.*, 2005; Thabet *et al.*, 2006), with the strongest consistent positive association observed for PTSD. Moreover, direct individual war experiences (particularly child's victimization and loss of family members especially parents due to death or separation) were the strongest predictors of poor mental health, though not outcome-specific (Al-Eissa, 1995; Al-

Khawaja, 1997; Elbedour *et al.*, 2007; Giacaman *et al.*, 2007; Karam *et al.*, 2008b; Morgos *et al.*, 2008).

Parents' psychopathology/family functioning

Parents' psychopathology emerged as a significant predictor of mental health outcome variables in children and adolescents exposed to war/military violence traumatic events, with the mother's psychological distress symptoms having a greater effect than the father's ill mental health (Al-Turkait & Ohaeri, 2008; Massad *et al.*, 2009; Massad *et al.*, 2011; Punamäki & Suleiman, 1990; Punamäki *et al.*, 2011; Qouta *et al.*, 2003; Qouta *et al.*, 2005; Thabet *et al.*, 2001; Thabet *et al.*, 2008). In addition, dysfunctional family and tense family ambience, and rival sibling relationship came out as important risk factors for poor mental health in children who experienced war trauma (Garbarino & Kostelny, 1996; Karam *et al.*, 2007; Karam *et al.*, 2008b; Khamis, 2005).

Parenting practices and support

Negative parenting (characterized by punishment and rejection, psychological control and conflict, and lack of support) came out as mediator of the association between war trauma exposure and children's psychological distress (Barber, 1999; Punamäki *et al.*, 1997), whereas good parenting (characterized by love, care and support) was found to decrease the negative impact of war trauma experiences on children's psychological problems (Punamäki *et al.*, 1997; Punamäki *et al.*, 2001; Punamäki *et al.*, 2011; Thabet *et al.*, 2009). Lebanese Children exposed to war events who used problem solving coping strategies had lower odds of scoring positively on the SDQ and the CRIES (Fayyad *et al.*, 2016).

Children coping modes

It seems that children who adopted instrumental help-seeking had less health problems than those who used emotional help-seeking as a coping means (Abdeen *et al.*, 2008; Elbedour *et al.*, 2007; Khamis, 2008; Punamäki & Suleiman, 1990).

Limitations of studies conducted in the Arab world to date

Though it shall not be overlooked that conducting research during or following war is difficult and far from

ideal, multiple limitations, inherent to research methodologies, were noted.

Most studies employed cross-sectional design; hence, it was not possible to examine development of psychopathology among children in response to exposure to war trauma events, and causal links between exposure, mediating variables, and outcomes could not be established. For studies that used longitudinal design, mental health outcomes were not all assessed during exposure and later on during calm or peaceful times; hence conclusions regarding recovery were only applicable to those outcomes which were assessed during and after. Furthermore, most studies had no control groups; hence analyses were carried out within war trauma groups without comparisons. For some studies, small sample size reduced power for testing effects of multiple variables' interactions on health-related outcomes in children. Using school-based samples might have excluded children who had extreme/severe war traumatic experiences; thus findings could not be generalized to children who were not in school.

With regard to measurement bias: a) Reliance on data collection from one source (either children's self-reports or mothers' reports) posed a data validation/reliability problem due to several limitations such as inaccurate recall, false report and social desirability. Reports by other informants could have validated children's or parents' reports on their children's behavior; b) diagnostic instruments were rarely used; c) when instruments were used, cross-cultural validation was not investigated enough; d) there was low agreement between instruments used to measure the same outcome in the sample for some studies; and, e) multiple definitions, and hence assessment tools, were adopted for constructs such as social support, parental support, etc., which limited comparison of findings of studies.

It was not uncommon that multiple potential confounding variables that may have influenced data interpretation were not controlled for, such as occurrence of other life stressors, child's cognitive capacity and personality, children's coping strategies, mothers psychological distress, parenting style, family functioning, parental coping style, social support, comorbid mental or physical problems in children, etc. In addition, it is not often that the full spectrum of children's war experiences was looked at in a study sample which would have possibly distorted interpretations of associations between exposure and children's mental health outcomes.

Future research directions

In view of the profound acute, and possibly enduring, detrimental impact of war trauma experiences on children's mental health, it has become apparent that there is a need to approach the post-war period not only along the lines of providing refuge and subsistence, but, at the same time, offering mental health services and studying the effects of these (Karam *et al.*, 2008b; Fayyad *et al.*, 2010).^{28,73}

To fill in the gap in our knowledge of the impact of war exposure on children's mental health and its interaction with many individual, social, and environmental factors, and to inform planning and provision of effective services, future research undertakings shall take into account:

- 1- Conducting studies with control (non-exposed) groups which provide baseline data for comparison, in addition to exposed groups;
- 2- Validation of outcome assessment tools/instruments and possibly adaptation and use of standardized tools for cross-country comparisons;
- 3- Longitudinal studies are needed to better explain findings of associations/relations of war trauma exposures and mental health outcomes. They are also needed to determine whether impact of war traumas on children developmental outcomes (affective symptoms and behavioral outcome) is transient or more permanent, adaptive or maladaptive on the long term;
- 4- The mere experience of war traumatic events does not imply particular children's mental health outcomes. Impact of war trauma exposure on children's mental health varied not only with their own exposure but also with their parents' exposure (particularly their mother's exposure). Findings support the central role of family relations, surpassing other social relations, in children's adjustment to war trauma exposures. Both child and family factors/variables must be examined in research and interventions;
- 5- The full spectrum of children's exposure to violence needed to be examined and not just exposure to war events in order to better understand mental health outcomes, and recommend intervention measures;
- 6- The concept of children's resilience to war events exposure has gained coverage in recent literature and merits further investigation;
- 7- Knowledge about Arab children's coping with war/war-like stressors and its relation to health outcomes is scarce; there is pressing need to set about research in this direction.

Acknowledgements

The authors would like to thank Fabian Kattlun for his assistance in preparing the manuscript. This work is supported by anonymous private donations to IDRAAC, Lebanon, unrestricted grants from, AstraZeneca, Bella Pharma, Eli Lilly, Lundbeck, Novartis, Servier, Pfizer, and UPO.

References

1. Bruffaerts R, Demyttenaere K, Borges G, Haro J, Chiu W et al. Childhood adversities as risk factors for onset and persistence of suicidal behaviour. *Br J Psychiatry*. 2010;197(1):20-27.
2. Kessler R, McLaughlin K, Green J, Gruber M, Sampson N et al. Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *Br J Psychiatry*. 2010;197(5):378-385.
3. Stein D, Chiu W, Hwang I, Kessler R, Sampson N et al. Cross-national analysis of the associations between traumatic events and suicidal behavior: findings from the WHO World Mental Health Surveys. *PLoS One*. 2010;5(5):e10574.
4. Karam EG, Mneimneh Z, Dimassi H, Fayyad J, Karam A et al. Lifetime prevalence of mental disorders in Lebanon: First onset, treatment, and exposure to war. *PLOS Medicine*. 2008a;5(4):e61.
5. Ahmad A, Mohamed H, Ameen N. A 26-month follow-up of posttraumatic stress symptoms in children after the mass-escape tragedy in Iraqi Kurdistan. *Nord J Psychiatry* 1998;52(5):357-366.
6. Ahmad A, Sofi M, Sundelin-Wahlsten V, Von Knorring A. Posttraumatic stress disorder in children after the military operation "Anfal" in Iraqi Kurdistan. *Eur Child Adolesc Psychiatry*. 2000;9(4):235-243.
7. Dyregrov A, Gjestad R, Raundalen M. Children exposed to warfare: a longitudinal study. *J Traum Stress*. 2002; 15(1):59-68.
8. Dyregrov A, Raundalen M. Threat in the life of Iraqi children. *New Direc. for Youth Develop*. 2003;98:111-118.
9. Razokhi A, Taha I, Taib N, Sadik S, Al Gasseer N. Mental health of Iraqi children. *Lancet*. 2006;368(9538): 839-839.
10. Al-Jawadi A, Abdul-Rhman S. Prevalence of childhood and early adolescence mental disorders among children attending primary health care centers in Mosul, Iraq: a cross-sectional study. *BMC Public Health*. 2007;7:274.
11. Lokuge K, Shah T, Pintaldi G, Thurber K, Martínez-Viciano C et al. Mental health services for children exposed to armed conflict: Médecins sans frontières' experience in the democratic republic of Congo, Iraq and the occupied palestinian territory. *Paediatrics Int Child Health*. 2013;33(4):259-272.
12. Jaddou H. Psychiatric disorders among adolescent Jordanian returnees from Kuwait during the 1991 Gulf War. *East Mediterr Health J*. 2003;1(2):20-7.
13. Nader K, Pynoos R, Fairbanks L, Al-Ajeel M, Al-Asfour A. A preliminary study of PTSD and grief among the children of Kuwait following the Gulf crisis. *Br J Clin Psychol*. 1993;32:407-16.

14. Abdullatif H. Prevalence of depression among middle-school Kuwaiti students following the Iraqi invasion. *Psychol Reports*. 1995;77(2):643-649.
15. Al-Eissa Y. The impact of the Gulf armed conflict on the health and behaviour of Kuwaiti children. *Soc Sci Med*. 1995;41(7):1033-7.
16. Al-Khawaja J. Clinical description of children's anxiety during the Gulf War. *Psychol Reports*. 1997;80 (3):733-734.
17. Hadi F, Llabre M. The Gulf crisis experience of Kuwaiti children: psychological and cognitive factors. *J Traum Stress*. 1998;11(1):45-56.
18. Awadb A, Vance B, El-Beblawi V, Pumariega A. Effects of trauma of the Gulf War on Kuwaiti children. *J Child Famil Stud*. 1998;7(4):493-498.
19. Hadi F, Llabre M, Spitzer S. Gulf War-related trauma and psychological distress of Kuwaiti children and their mothers. *J Traum Stress*. 2006;19(5):653-62.
20. Llabre M, Hadi F. War-Related Exposure and Psychological Distress As Predictors of Health and Sleep: A Longitudinal Study of Kuwaiti Children. *Psychos Med*. 2009;71(7):776-83.
21. Al-Turkait F, Ohaeri J. Psychopathological status, behavior problems, and family adjustment of Kuwaiti children whose fathers were involved in the first gulf war. *Child Adolesc Psychiatry Ment Health*. 2008.
22. Saigh P. An experimental analysis of chronic posttraumatic stress among adolescents. *J Gen Psychol*. 1985;146(1):125-131.
23. Hourani L, Armenian H, Zurayk H, Afifi L. A population-based survey of loss and psychological distress during war. *Soc Sci Med*. 1986;23(3):269-275.
24. Chimienti G, Nasr J, Khalifeh I. Children's reactions to war-related stress. Affective symptoms and behaviour problems. *Social Psychiatry Psychiatr Epidemiol*. 1989; 24(6):282-7.
25. Saigh P. The development of posttraumatic stress disorder following four different types of traumatization. *Behav Res Ther*. 1991;29(3):213-6.
26. Zahr L. Effects of war on the behavior of Lebanese preschool children: influence of home environment and family functioning. *Am J Orthopsych*. 1996;66(3):401-8.
27. Karam E, Fayyad J, Salamoun M, Debs M, Tabet C et al. Assessment Study of Psychosocial Status of Children and Adolescents in the South of Lebanon and Southern Suburbs of Beirut After the July 06 War (SSSS). 2007.
28. Karam E, Fayyad J, Nasser Karam A, Cordahi Tabet C, Melhem N et al. Effectiveness and specificity of a classroom-based group intervention in children and adolescents exposed to war in Lebanon. *World Psychiatry*. 2008b;7(2):103-9.
29. El Zein HL, Ammar DF. Assessing Lebanese children's reactions to war-related stress. *J Loss Traum*. 2011;16 (3):195-204.
30. Karam E, Fayyad J, Karam A, Melhem N, Mneimneh et al. Outcome of depression and anxiety after war: a prospective epidemiologic study of children and adolescents. *J Traum Stress*, 2014; 27:192-199.
31. Punamäki R, Suleiman R. Predictors and effectiveness of coping with political violence among Palestinian children. *Br J Soc Psychol*. 1990;29(1):67-77.
32. Baker A. The psychological impact of the Intifada on Palestinian children in the occupied West Bank and Gaza: an exploratory study. *Am J Orthopsychiatry*. 1990; 60(4):496-505.
33. Kostelny K, Garbarino J. Coping with the consequences of living in danger: The case of Palestinian children and youth. *Int J Behav Dev*. 1994;17(4):595-611.
34. Garbarino J, Kostelny K. The effects of political violence on Palestinian children's behavior problems: a risk accumulation model. *Child Development*. 1996;67(1): 33-45.
35. Barber B. Political violence, family relations, and Palestinian youth functioning. *J Adolesc Res*. 1999;14 (2):206-230.
36. Miller T, El-Masri M, Allodi F, Qouta S. Emotional and behavioural problems and trauma exposure of school-age Palestinian children in Gaza: some preliminary findings. *Medicine, Conflict and Survival*. 1999;15(4):368-378.
37. Thabet A, Vostanis P. Posttraumatic stress reactions in children of war. *J Child Psychol Psychiatry*. 1999;40(3): 385-391.
38. Thabet A, Vostanis P. Posttraumatic stress disorder reactions in children of war: a longitudinal study. *Child Abuse Negl*. 2000;24(2):291-298.
39. Punamäki R, Qouta S, El Sarraj E. Models of traumatic experiences and children's psychological adjustment: the roles of perceived parenting and the children's own resources and activity. *Child Dev*. 1997;68(4):718-728.
40. Punamäki R, Qouta S, El-Sarraj E. Resiliency factors predicting psychological adjustment after political violence among Palestinian children. *Int J Behavioral Develop*. 2001;25(3):256-267.
41. Qouta S, El-Sarraj E, Punamaki R. Mental flexibility as resiliency factor among children exposed to political violence. *Int J Psychol*. 2001;36(1):1-7.
42. Qouta S, Punamäki R, Montgomery E, El Sarraj E. Predictors of psychological distress and positive resources among Palestinian adolescents: trauma, child, and mothering characteristics. *Child Abuse Negl*. 2007; 31(7):699-717.
43. Zakrison T, Shahen A, Mortaja S, Hamel P. The prevalence of psychological morbidity in West Bank Palestinian children. *Can J Psychiatry*. 2004;49(1):60-63.
44. Khamis V. Posttraumatic stress disorder among school age Palestinian children. *Child Abuse Negl*. 2005;29(1):81-95.
45. Thabet A, Abed Y, Vostanis P. Effect of trauma on the mental health of Palestinian children and mothers in the Gaza Strip. *East Mediterr Health J*. 2001;7(3):413-421.
46. Thabet A, Abed Y, Vostanis P. Emotional problems in Palestinian children living in a war zone: a cross-sectional study. *The Lancet*. 2002;359:1801-1804.
47. Baker A, Kanan H. Psychological impact of military violence on children as a function of distance from traumatic event: The Palestinian case. *Intervention*. 2003; 1(3):13-21.

48. Qouta S, Punamäki R, El Sarraj E. Prevalence and determinants of PTSD among Palestinian children exposed to military violence. *Eur Child Adolesc Psychiatry*. 2003;12(6):265-272.
49. Qouta S, Punamäki R, El Sarraj E. Mother-child expression of psychological distress in war trauma. *Clin Child Psychol Psychiatry*. 2005;10(2):135-156.
50. Thabet A, Abed Y, Vostanis P. Comorbidity of PTSD and depression among refugee children during war conflict. *J Child Psychol Psychiatry*. 2006;45(3):533-542.
51. Qouta S, Odeh J. The impact of conflict on children: the Palestinian experience. *Journal of Ambulatory Care Management*. 2005;28(1):75-79.
52. Thabet A, Karim K, Vostanis P. Trauma exposure in pre-school children in a war zone. *Br J Psychiatry*. 2006; 188:154-158.
53. Elbedour S, Onwuegbuzie A, Ghannam J, Whitcome J, Abu Hein F. Post-traumatic stress disorder, depression, and anxiety among Gaza Strip adolescents in the wake of the second Uprising (Intifada). *Child Abuse Negl*. 2007; 31(7):719-729.
54. Giacaman R, Shannon H, Saab H, Arya N, Boyce W. Individual and collective exposure to political violence: Palestinian adolescents coping with conflict. *Eur J Public Health*. 2007;17(4):361-368.
55. Giacaman R, Abu-Rmeileh N, Husseini A, Saab H, Boyce W. Humiliation: the invisible trauma of war for Palestinian youth. *Public Health*. 2007;121(8):563-571.
56. Abdeen Z, Qasrawi R, Nabil S, Shaheen M. Psychological reactions to Israeli occupation: Findings from the national study of school-based screening in Palestine. *Int J Behav Develop*. 2008;32(4):290-297.
57. Thabet A, Ibraheem A, Shivram R, Winter E, Vostanis P. Parenting support and PTSD in children of a war zone. *Int J Soc Psychiatry*. 2009;55(3):226-37.
58. Khamis V. Post-traumatic stress and psychiatric disorders in Palestinian adolescents following intifada-related injuries. *Soc Sci Med*. 2008;67(8):1199-1207.
59. Thabet A, Abu Tawahina A, El Sarraj E, Vostanis P. Exposure to war trauma and PTSD among parents and children in the Gaza strip. *Eur Child Adolesc Psychiatry*. 2008;17(4):191-9.
60. Espié E, Gaboulaud V, Baubet T, Casas G, Mouchenik Y et al. Trauma-related psychological disorders among Palestinian children and adults in Gaza and West Bank, 2005-2008. *Int J Men Health Syst*. 2009;3(1):21.
61. Massad S, Javier Nieto F, Palta M, Smith M, Clark R et al. Mental health of children in Palestinian kindergartens: Resilience and vulnerability. *Child and Adolesc Ment Health*. 2009;14(2):89-96.
62. Massad S, Nieto F, Palta M, Smith M, Clark R et al. Health-related quality of life of Palestinian preschoolers in the Gaza Strip: a cross-sectional study. *BMC Public Health*. 2011;11:253.
63. Dubow E, Boxer P, Huesmann L, Shikaki K, Landau S et al. Exposure to conflict and violence across contexts: relations to adjustment among Palestinian children. *J Clin Child Adolesc Psychol*. 2010;39(1):103-116.
64. Punamäki RL, Qouta S, Miller T, El-Sarraj E. Who are the resilient children in conditions of military violence? Family- and child-related factors in a Palestinian community sample. *Peace and Conflict: J Peace Psychol*. 2011;17(4):389-416.
65. Kolltveit S, Lange-Nielsen I, Thabet A, Dyregrov A, Pallesen S et al. Risk factors for PTSD, anxiety, and depression among adolescents in Gaza. *J Traum Stress*. 2012;25(2):164-170. doi:10.1002/jts.21680
66. Kia-Keating M, Ellis B. Belonging and connection to school in resettlement: young refugees, school belonging, and psychosocial adjustment. *Clin Child Psychol Psychiatry*. 2007;12(1):29-43.
67. Ellis B, MacDonald H, Lincoln A, Cabral H. Mental health of Somali adolescent refugees: the role of trauma, stress, and perceived discrimination. *J Consulting Clin Psychol*. 2008;76(2):184-193.
68. Paardekooper B, de Jong J, Hermanns J. The psychological impact of war and the refugee situation on South Sudanese children in refugee camps in Northern Uganda: an exploratory study. *J Child Psychol Psychiatry*. 1999;40(4):529-36.
69. Geltman P, Grant-Knight W, Mehta S, Lloyd-Travaglini C, Lustig S et al. The "lost boys of Sudan": functional and behavioral health of unaccompanied refugee minors re-settled in the United States. *Arch Pediatr Adolesc Med*. 2005;159(6):585-91.
70. Morgos D, Worden J, Gupta L. Psychosocial effects of war experiences among displaced children in Southern Darfur. *Omega*. 2008;56(3):229-253.
71. Karam E, Fayyad J, Farhat C, Itani L, Chidiac F et al. Childhood adversities, sensitivity and war exposure in the mental health of Syrian children and adolescents (Manuscript in preparation).
72. Fayyad J, Cordahi CT, Yertezian J, Salamoun M, Najm C, Karam E. Resilience Promoting Factors in War Exposed Adolescents: An Epidemiologic Study. *Eur Child Adolesc Psychiatry*. DOI: 10.1007/s00787-016-0871-0
73. Fayyad JA, Farah L, Cassir Y, Salamoun MM, Karam EG. Dissemination of an Evidence-Based Intervention to Parents of Children with Behavioral Problems in a Developing Country. *Eur Child Adolesc Psychiatry*. 2010;19(8):629-36.

المخلص

الهدف: شهد العديد من البلدان في العالم العربي الحروب في العقود المنصرمة. هدف هذا الملخص هو دراسة تأثير تعرض الأطفال والمراهقين العرب لحوادث الحرب الصادمة على صحتهم النفسية. طريقة البحث: أكملنا بحث علمي حول تأثير التعرض للحرب على الصحة النفسية للأطفال / المراهقين لجميع البلدان في العالم العربي حتى 15 سبتمبر 2014 باستخدام PubMed، و PsycINFO **النتائج:** يشمل الملخص 67 دراسة: 7 من العراق، 1 من الأردن، 9 من الكويت، 9 من لبنان، 35 من فلسطين، 2 من صوماليا، 3 من السودان، و 1 من سوريا. أظهرت النتائج وجود علاقة إيجابية ذات دلالة إحصائية بين شدة التعرض لأحداث الحرب الصادمة ومعدلات / حدة أعراض اضطراب ما بعد الصدمة، الاكتئاب، المشاكل السلوكية، ومشاكل نفسية الأخرى. **الخلاصة:** الحروب أثرت سلباً على

الصحة النفسية للأطفال والمراهقين في العالم العربي. فمن الضروري تنفيذ الأنشطة التي تعمل على تحسين الصحة النفسية للأطفال والمراهقين المعرضين للحرب.

Corresponding author

Prof Elie Karam, MD

Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut - Lebanon

Email address: egkaram@idraac.org

Authors

Ms Lynn Itani, MPH

Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Email address: lynn.a.itani@gmail.com

Dr Doris Jaalouk, PhD

Faculty of Nursing and Health Sciences, Notre Dame University- Lebanon

Email address: djaalouk@wise.net.lb

Dr John Fayyad, MD

Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut - Lebanon

Email address: jfayyad@inco.com.lb

Dr Jessica Toress Garcia, MD

Facultad De Medicina, UAN - Mexico

Email address: jessica_torresg@hotmail.com

Dr Fouad Chidiac, MD

Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut, Lebanon.

Email: fouad.chidiac88@gmail.com

Table 1. Studies that investigated the effect of exposure to war traumata on the mental health of children/adolescents in the Arab world

Country	Reference	Date of study	Sample size and characteristics	Age (years)	Instruments and diagnostic tools (limited to listing of instruments that were used to measure children's war exposure & mental health outcomes)	Main findings (limited to prevalence data)
Iraq	Ahmad et al. (1998)	1991-1993	Random sample of Kurdish Iraqi children and adolescents who had been exposed to the mass-escape tragedy in 1991 following the Gulf war (N=20)	6-16 years at baseline; T1: 1991 T2: 1991 T3: 1992 T4: 1993	Posttraumatic stress symptoms for children (PTSS-C), developed by Ahmad A	PTSD prevalence at T1: 20%, at T2: 0%, at T3: 23%, at T4: 18%
	Ahmad et al. (2000)	1993	Random sample of Kurdish Iraqi refugee children and adolescents who had experienced the Anfal military attack (1988) and subsequent traumatic experiences during captivity (N=45)	7-17 (mean=12.4)	Harvard Trauma Questionnaire (HTQ) Child Posttraumatic Stress Disorder Reaction Index (PTSD-RI) Posttraumatic stress symptoms for children (PTSS-C) developed by Ahmad A	PTSD: 87%
	Dyregrov et al. (2002)	1991-1993	Community-based sample of Iraqi children who were exposed to the bombing of a shelter close to the area where children lived during the 1991 Gulf War N=107 in 1991 N=101 in 1992 N=94 in 1993	6-17 years (mean=11.5) at baseline; T1: 1991 T2: 1992 T3: 1993	War Trauma Questionnaire Child Behavior Inventory (CBI) Posttraumatic Stress Reactions Checklist (PTSRC) Impact of Event Scale (IES) 8-item Grief Scale	Probable PTSD at T1: 84% , at T2: 88%, at T3: 78%
	Dyregrov & Raundalen (2003)	2003	Random sample of Iraqi school children and adolescents from different areas of Baghdad and Basra (N=232)	10-16 years (mean=12.7)	Iraqi Child and Adolescent Questionnaire Impact of the Threat Questionnaire Birlerson Depression Inventory	Depression: 71% Fear of something bad happening to their family: 70% Headaches: 61% Attention and concentration difficulties: 60% Felt that life was not worth living: 57% Felt very lonely: 50% Sleeping difficulties: 50%
	Razokhi et al. (2006)	2006	Study 1: Primary school children from 16 schools in Baghdad (N=600) Study 2: School adolescents from 8 secondary schools in Mosul (N=1090)	Study 1: Mean age=10.3	-	Study 1: Exposed to a major traumatic event in the past 2 years: 47% PTSD in total sample: 14% PTSD in girls: 17%, PTSD in boys: 9% Study 2: PTSD in total sample: 30% PTSD in girls: 32%, PTSD in boys: 26%
	Al-Jawadi & Abdul-Rhman (2007)	2003-2004	Randomly selected sample of children enlisted from four primary health care centers in Mosul (N=3079)	1-15 years Gp1: 1-4 years (26.9%) Gp2: 5-9 years (44.4%) Gp3: 10-15 years (28.7%)	Standardized questionnaire derived from the diagnostic criteria taken from DSM-IV-TR	Point prevalence: PTSD: 10.5% PTSD in girls: 13.8%, PTSD in boys: 7.8% Mental disorders in total sample: 37.4%
	Lokuge et al (2013)	2009-2012	1676 Iraqis younger than age 20 years of age		MSF mental health guidelines where they categorize groups of symptoms related to specific mental health condition	38.2% had, at the time of interview, anxiety related complaints, 10.2% had mood-related complaints, 12.2% had behavior-related complaints (aggressive, impulsive, repetitive behavior etc.), and 39.5% had physical symptoms.
Jordan	Jaddou (2003)	2001 (10 years after exposure)	Convenient sample of exposed (E) Jordanian university students (N=146) who were displaced from Kuwait to Jordan during 1991 Gulf war, compared to a control group (C) (N=1230)	Mean age=10.1 at time of exposure	28-item General Health Questionnaire	Psychological distress : 30.8% E, 22.4% C
Kuwait	Nader et al. (1993)	Summer 1991	Randomly selected pilot sample of Kuwaiti school children who had mid-range exposures to war events during the 1991	8-17 divided as such:	Exposure to war-related experiences questionnaire Revised child post-traumatic stress disorder reaction	Some PTS reactions: 98% Mild PTS reactions: 29%

Mental Health Outcomes for War Exposed Children

		Gulf war (N=49)	8-10 (N=13) 11-17 (N=36)	index (CPTSD-RI) A Grief Index;	Moderate PTS reactions: 40% Severe PTS reactions: 31% 1 or more grief symptoms: 98%
Abdullatif (1995)	1992-1993	Random sample of Kuwaiti school children and adolescents who had witnessed atrocities during the Iraqi invasion (N=1981)	10-16 years mean age= 12.8 for boys; mean age= 12.4 for girls	The Arabic Children's Depression Inventory designed by Abdel-Khalek;	3.7% of boys and 4.8% of girls had total scores on the depression scale greater than 2SDs.
Al-Eissa (1995)	October 1990	Randomly selected sample of exposed (E) Kuwaiti children who left to Saudi Arabia during the Iraqi invasion (N=106), and a control sample (C) of Saudi children (N=120)	7-14 divided as: 7-10 (2/3) & 11-14 (1/3); Mean (E)=10.1; Mean (C)= 10.4	A structured questionnaire developed by the authors	Poor concentration: 63% E, 11% C Distractibility: 41% E, 12% C Overdependency: 54% E, 19% C Emotional lability: 67% E, 21% C Difficulty sleeping: 35% E, 7% C Nightmares: 37% E, 9% C Withdrawal: 30% E, 12% C
Al-Khawaja (1997)		Kuwaiti children who had witnessed a multitude of war trauma events during the Iraqi invasion to Kuwait (N=322)	5-16 years Mean=10.4	Not clear how they assessed for war trauma events; Body language & child's behavior used as indicators of anxiety level	No prevalence data
Awadb et al. (1998)	1991, 1996	Randomly selected sample of exposed (experienced or witnessed war-events during the Iraqi occupation) children from a governmental list (N=30), and control group (children who left Kuwait early during the war) (N=30)	10-12 years at baseline T1: 1991 T2: 1996	Child Traumatic Reaction Index developed based on DSM-IV PTSD criteria;	<u>At T1:</u> PTSD: 65%; among PTSD cases 60% showed symptoms overlapping with depression, anxiety, & hyperactivity <u>Persistent & steady PTSD symptoms at T2</u>
Hadi & Llabre (1998)	1991-1992	Randomly selected representative sample of school children who had direct and indirect exposure to war events during the Iraqi occupation (N=233)	8-12 years	A structured crisis interview (CI) developed by the authors was used to assess the children's level of exposure to violence; Child Posttraumatic Stress Disorder Reaction Index (PTSDI); Children's depression inventory (CDI);	PTSD: 62% Mild PTSD: 34% Moderate PTSD: 23% Severe PTSD: 4%
Hadi et al. (2006)	1993, 2003	Randomly selected sample of exposed (father killed, missing or arrested during the Iraqi occupation) school children (N=84), & control group (N=27); same sample as that employed in Llabre & Hadi (1997)	9-12 years at baseline T1: 1993 T2: 2003	Crisis Structured Interview (CSI) Post-Traumatic Stress Disorder Symptom Scale (PTSDS) adapted from the Davidson Self-Rating PTSDS Children's Depression Inventory (CDI) Revised Children's Manifest Anxiety Scale (RCMAS) Kuwaiti version of the Beck Depression Inventory (BDI-K) Symptom Checklist-90-Revised Trait Anxiety	Persistent PTSS & anxiety at T2
Al-Turkait & Ohaeri (2008)	1997	Random sample of children of Kuwaiti military men who had had varying levels of war trauma exposure during the Gulf war 1991 (N=355)	6-16 years	Child Behavior Inventory (CBI) Rutter Scale A-2-parent's version McMaster Family Assessment Device (FAD)	<u>6 months prevalence:</u> Depression: 14.4% Anxiety: 14.9% Comorbidity of depression & anxiety common in more than 50% of cases Aggression (high levels): 16.1% Deficient prosocial behavior: 16.6% Deficient planful behavior: 19.7% ----- Neurotic behavior: 16.9% Antisocial behavior: 17.1%
Llabre & Hadi (2009)	1993, 2003	Randomly selected sample of exposed (father killed, missing or arrested during the Iraqi occupation) school children (N=84) and control group (N=27); same sample as that employed in Llabre & Hadi (1997) & Hadi et al. (2006)	9-12 years at baseline T1: 1993 T2: 2003	Crisis Structured Interview (CSI) Posttraumatic Stress Disorder Symptom Scale (PTSDS) adapted from the Davidson Self-Rating PTSDS Children's Depression Inventory (CDI) Revised Children's Manifest Anxiety Scale (RCMAS) Life Events Checklist	Persistent PTSS at T2

					Pittsburgh Sleep Quality Index A 4-item measure of general health	
Lebanon	Saigh (1985)	1982	Sample of high school students enrolled in a private school in West Beirut (N=62)	Mean age= 15.1	Lebanese Fear Inventory (LFI) Fear Survey Schedule (FSS) State Trait Anxiety Inventory (STAI)	No prevalence data
	Hourani et al. (1986)	1982	Random community-based sample of children and adolescents living in West Beirut during Israeli Invasion of Lebanon, summer 1982 (N=2958)	49.6%: < 10 years; 50.4%: 11-19 years	Psychological distress symptoms' checklist adapted from the Red Cross literature on emergency psychiatric care in disasters	Psychological distress symptoms: 7.4%
	Chimienti et al. (1989)	Spring 1985	Randomly selected sample of school children representative of population segments exposed to a general war stress situation (heavy fighting or shelling) (N=1039)	3-9 years Mean age=6.3	A questionnaire developed by the authors was used to collect data on exposure to war traumas and emotional and behavioral problems in children	Prevalence in total sample: Physical symptoms: 71% Hyperactivity: 61% Over-dependency: 88% Shouting & screaming: 62% Crying easily: 66% Nagging: 48% Possessive with children: 57% Defiant with adults: 40%
	Saigh (1991)	-	Sample of exposed PTSD (clinical sample) traumatized by direct experience of war events, observation, verbal mediation, combination of direct experience and observation (N=230) and a control group of non-exposed non-PTSD (N=35)	9-13 years	Children's Posttraumatic Stress Disorder Inventory (PTSDI) based on DSM-III PTSD criteria Revised Children's Manifest Anxiety Scale (RCMAS) Children's Depression Inventory (CDI) Connor's Teacher Rating Scale (CTRS)	No prevalence data
	Zahr (1996)	1990-1991	Two convenient samples of exposed (E) (experienced heavy shelling in 1989) preschool children (N=100) and control (C) (non-exposed) (N=100); both samples came from middle-class	3-6 years Mean=4.2	Eyberg Child Behavior Inventory (ECBI)	<u>2 years prevalence:</u> Refusal to go to sleep alone: 72% E, 46% C Over-dependency on parents: 44% E, 28% C Excessive thumb-sucking: 64% E, 39% C Nightmares: 25% E, 16% C
	Karam et al. (2007)	Feb. 2007	Random sample of school children and adolescents, representative of the population most affected by July 2006 Israel war on Lebanon (South Lebanon & Southern Suburbs of Beirut); Gp 1 (N=709), Gp 2 (N=261)	Gp 1: 12-18 years (mean=14.6) Gp2: 8-11 years Gp 3: 3-7 years	Strengths & Difficulties Questionnaire (SDQ) Child-Revised Impact of Events Scale (CRIES)	<u>6 months incidence:</u> Psychological symptoms in adolescents: 50% High-moderate probability of having a mental disorder in adolescents: 14.5% <u>1 week prevalence:</u> PTSD in adolescents: 15.4% Irritability: 31.2% Trying not to remember war events: 28.0% Trying to avoid reminders of the war: 26.3% Startling more easily: 25.6% Having difficulties sleeping: 16.6%
	Karam et al. (2008)	1996-1997	Randomly selected sample of school children from the South heavily exposed to the 1996 Israel war on Lebanon (N=93)	6-18 years at baseline (mean=11.8) T1: 1996 T2: 1997	War Events Questionnaire (WEQ) Diagnostic Interview for Children and Adolescents - Revised (DICA-R)	<u>At T1:</u> 1 month prevalence Major depressive disorder (MDD): 26.9% Separation anxiety disorder (SAD): 17.2% Post-trauma stress disorder (PTSD): 31.2% <u>At T2:</u> MDD: 8.6% SAD: 6.4% PTSD: 2.2%
	El Zein & Ammar (2011)		Community based sample of children from South of Lebanon who were directly exposed to bombardment during the July 2006 war (N=110), and a control, non-exposed group (N=105)	9-12 years	Spielberger's State-Trait Anxiety Inventory, Arabic version (STAI-A)	No prevalence data
	Karam et al (2014)	1996-1997	Randomly selected sample of school children from South and Southwest Bekaa. Phase 1: n=386, Phase 2: n=143.	Mean of 11.5 at baseline	Diagnostic Interview for Children and Adolescents Revised (DICA-R), DSM III-R, War Events Questionnaire	The rate of any disorder in the n=143 sample was: Phase 1: 44.1%, Phase 2: 9.2%. Witnessing any war event was significantly associated with having a mental disorder at Phase 1, as well as the persistence of the disorder until Phase 2.

Mental Health Outcomes for War Exposed Children

Palestine	Baker (1990)	1989	Random sample of children from the West bank and Gaza, who had experienced intense military violence during the first Intifada for 2 years (N=796)	6-15 years	Observed Symptoms Rating Scale The Nowicki-Strickland Locus of Control Scale for Children The Cooper Smith Self-Esteem Inventory	Disturbing others: 29.5% Persistent irresponsible behavior: 27.2% Jealousy of others: 28.2% Difficulty awakening in the morning: 15.0% Feeling depressed: 11.3% Fears soldiers: 46.7% Fears leaving the house: 27.8%
	Punamäki & Suleiman (1990)	1982	Representative sample of children who had been experiencing political violence occurring under conditions of military occupation & national struggle against it (N=66)	8-14 years	A checklist of 17 political hardships developed by the authors; A modified checklist from the classification by Rutter, Shaffer & Shepherd (1975) was used to measure children's psychological symptoms; Castaneda's Children's Form of Manifest Anxiety Scale- shortened version;	No prevalence data
	Kostelny & Garbarino (1994)	1989	Convenient sample of Palestinian children from the West Bank exposed to military violence for 2 years after the onset of the first Intifada (N=40); Gp 1: N= 20, Gp 2: N=20	Gp 1: 5-8 years Gp 2: 12-15 years	Open-ended interview with the mothers was used to assess exposure to military violence & children's behavioral and personality changes Achenbach Child Behavior Checklist (CBC), Arabic version Content analysis of children's drawings	<u>In 5-8 years old:</u> Behavioral problems & personality changes: 40% Fears of going to school: 35% Crying & screaming when seeing soldiers: 30% <u>In 12-15 years:</u> Disobedience to authority figures: 20% Aggressiveness: 15% Anxiety & nervousness: 15%
	Garbarino & Kostelny (1996)	1990	Sample of children from the West Bank exposed to military violence for 3 years during the first Intifada (N=150)	Gp1: 6-9 years Gp 2: 12-15 years	A Violence questionnaire developed by the authors was used to assess children's exposure to political violence Achenbach Child Behavior Checklist	Behavioral problems: 20.6%
	Punamäki et al. (1997)	1993 (last few months of the first intifada)	Sample of school children from Gaza who had experienced intense military trauma events during the first Intifada (N=108)	11-12 years	Traumatic Events Checklist Eysenck neuroticism scale (JEPQ) Rosenberg's scale further developed by Hof- man, Beit-Hallahmi, and Lazarowitz (1982)	No prevalence data
	Barber (1999)	1994-1995	Representative sample of school adolescents from the West Bank and Gaza who had participated in the first Intifada and experienced victimization during the movement (N=7000)	14-15years	A checklist of 8 items was used to measure Intifada experience Child Behavior Checklist–Youth Self-Report A set of 4 questions was used to assess antisocial behavior	No prevalence data
	Miller et al. (1999)	1996	Random sample of school children from Gaza who had a lifetime exposure to war trauma (N=669), divided into Gp 1(N=458), and Gp2 (N=211)	Gp1: 6-11 years Gp2: 12 and up	Health Reach Modified War Trauma Questionnaire; Ontario Child Health Scale (OCHS) Child Posttraumatic Stress Disorder Reaction Index (CPTS-RI)	<u>Among 6-11 years:</u> Conduct disorder: 14.4 % ADHD:10.0% Emotional disorder: 46.7% One or more behavioral or emotional disorders: 50.9% <u>Among 12 and up:</u> Conduct disorder: 12.3% ADHD:11.8% Emotional disorder: 28.0% One or more behavioral or emotional disorders: 35.5% Some PTSD: 87.4% Mild PTSD: 47.9% Moderate PTSD: 31.5% Severe PTSD: 8% Moderate- severe PTSD: girls (47.3%), boys (30.3%)

Thabet & Vostanis (1999)	1993 (6 months post first Intifada);	Representative sample of school children from Gaza who had experienced war traumas during the last months of the first Intifada (N=239)	6-11 years Mean =8.9	Gaza Traumatic Event Checklist Rutter Scales A2 and B2 Child Post-Traumatic Stress Reaction Index (CPTSD-RI)	Some PTSD reactions: 72.8% Mild PTSD: 31.8% Moderate PTSD: 35.6% Severe PTSD: 5.4%
Thabet & Vostanis (2000)	1993 (6 months post Intifada); 1994	Representative sample of school children from Gaza who had experienced war traumas during the last months of the first Intifada (N=234); possibly same sample surveyed in Thabet & Vostanis (1999)	6-11 years at baseline T1: 1993 T2: 1994 (mean age=9.9)	Gaza Traumatic Event Checklist Rutter Scales A2 and B2 Child Post-Traumatic Stress Reaction Index (CPTSD-RI)	<u>At T1:</u> Moderate-severe PTSD reactions: 40.6% Emotional & behavioral problems: 26.9% (parents' reports), 43.6% (teachers' reports) <u>At T2:</u> Moderate-severe PTSD reactions: 10.0% Emotional & behavioral problems: 20.9% (parents' reports), 31.8% (teachers' reports)
Punamäki et al. (2001)	1993 (last few months of the first Intifada); 1996	Sample of children from Gaza who had experienced intense military trauma events during the first Intifada (N=84); most likely same sample employed in Punamäki et al. (1997)	10-12 years at baseline (mean age=11) T1: 1993 T2: 1996	Traumatic Events Checklist Life- Event Scale derived from Holmes and Rahe (1967) A PTSD symptoms scale by Frederic, Pynoos, and Nader (1992) Eysenck's neuroticism scale (the JEPQ) Ontario Child- Health Scale (OCHS)	No prevalence data
Qouta et al. (2001)	1993 (last few months of the first Intifada); 1996	Sample of children from Gaza who had experienced intense military trauma events during the first Intifada (N=86); most likely same sample employed in Punamäki et al. (1997) and Punamäki et al. (2001)	10-12 years at baseline T1: 1993 T2: 1996	Traumatic Events Checklist A PTSD symptoms scale by Frederick, Pynoos, and Nader (1992) Eysenck neuroticism scale (the JEPQ) Rosenberg's scale further developed by Hofman, Beit-Hallahmi, and Lazarowitz (1982) Ontario Child Health Scale (OCHS)	No prevalence data
Thabet et al. (2001)	2000 (during the second Intifada)	Random sample of Palestinian children from Gaza (majority living in refugee camps) exposed to war traumatic events during the second Intifada (N=286)	9-18 years Mean=13.9	Gaza Traumatic Events Checklist Impact of Events Scale (IES)	PTSD: 34.3%
Thabet et al. (2002)	Early during the second Intifada	Community-based sample of children from Gaza exposed (E) to bombardment and demolition of houses during the second Intifada (N=91) and a control (C) sample (not exposed to bombardment yet experienced other war traumatic events such as witnessing bombardment by helicopters, seeing mutilated bodies on TV, etc.) (N=89)	9-18 years	Child Post-Traumatic Stress Reaction Index (CPTSD-RI), Arabic version Revised Children's Manifest Anxiety Scale (RCMAS) Children fears checklist	Severe/ very severe PTSD: 59% E, 25% C Anxiety disorders: 22% E, 39% C <u>In exposed group:</u> Difficulty in concentrating: 58% Sleep disturbance: 57% Avoidance of reminders: 52%
Baker et al. (2003)	2002	Randomly selected community-based sample of children from the West Bank, divided into 3 groups based on proximity to bombarded target (during the second Intifada): a) living in close proximity (N=79), b) living at a moderate distance (N=30), & c) living at a remote distance (N=31)	6-16 years Gp1: mean=10.2 Gp2: mean=10.5 Gp3: mean=10.7	Child PTSD Reaction Index (CPTSD-RI); Children's Depression Index (CDI); The Cooper Smith Self-Esteem Inventory;	No prevalence data
Qouta et al. (2003)	2002	Randomly selected community-based sample of refugee children from Gaza exposed to bombardment & shelling of homes during the second Intifada (N=121)	6-16 years Mean=8.2	War Trauma checklist; Child Post-Traumatic Stress Disorder Reaction Index (CPTSD-RI);	PTSD: 98.3% Mild PTSD: 9.1% Moderate PTSD: 35.5% Severe PTSD: 53.7%
Thabet et al. (2004)	Mid 2001	Representative sample of refugee children from Gaza exposed to intense military violence for 6 months since the onset of the second Intifada (N=403)	9-15 years Mean=12	Gaza Traumatic Events Checklist Child Post-Traumatic Stress Reaction Index (CPTSD-RI) Short Mood and Feelings Questionnaire (MFQ)	Mild PTSD symptoms: 21.1% Moderate PTSD symptoms: 52.6% Severe PTSD symptoms: 22.9% Concentration difficulties: 41.9% Avoidance of reminders: 37.5% Feeling upset when thinking about the event: 37.5% Intrusive images & sounds: 32.0% Intrusive thoughts: 31.6% Sleep disturbance: 31.6%

Mental Health Outcomes for War Exposed Children

						<p>Somatic complaints: 27.6% Nightmares: 22.5%</p> <hr/> <p>Crying a lot: 25.6% Feeling tired & doing nothing: 22.1% Feeling lonely: 18.4% Having difficulty to think properly or concentrate: 15.1% Feeling unhappy or sad: 13.9%</p>
Zakrisson et al. (2004)	2000 (before the second Intifada)	Randomly selected community-based sample of children from villages in the West Bank exposed to military occupation (N=206)	6-13years Mean=9.9	Rutter A2 Scale, (parent-reported)		Psychological morbidity: 42.3% Psychological morbidity: girls (37.8%), boys (46.3%)
Khamis (2005)	1999	Representative sample of school children, 85% from the West Bank (N=1000); 55% of the sample were exposed (E) to traumatic events (most common is political trauma)	12-16 years	A questionnaire was used to assess exposure to traumatic events The Child Psychological Maltreatment Scale PTSD module of the structured clinical interview for DSM-IV, Arabic version		PTSD in exposed: 62.3% PTSD in total sample: 34.1%
Qouta & Odeh (2005)	2003	Randomly selected representative community-based sample of children from Gaza (close to ¾ were refugee children) who had a lifetime exposure to military violence-related traumatic events (N=944)	10-19 years Mean= 15.1	War Trauma Checklist Posttraumatic Stress Disorder Scale, DSM –IV criteria Child Posttraumatic Stress Disorder Reaction Index (CPTSD-RI)		Mild PTSD levels: 16% Moderate PTSD levels: 49% Severe PTSD levels: 33%
Qouta et al. (2005)	2002	Randomly selected community-based sample of refugee children from Gaza exposed to war traumatic events during the second Intifada (N=121); same sample as that in Qouta et al. (2003)	6-16 years	War Trauma checklist Child Post-traumatic Stress Disorder Reaction Index (CPTSD-RI) Rutter Parent Questionnaire (RA2)		Prevalence of psychological distress & psychosomatic symptoms: Disobedience: 63.3% Temper tantrums: 51.7% Irritation: 46.2% Worries: 80.5% Social isolation: 61.9% Fears: 46.7% Concentration difficulties: 52.1% Hyperactivity: 46.2% Headaches: 49.2% Eating difficulties: 52.5%
Thabet et al. (2006)	_ during the second Intifada	Representative sample of pre-school children selected from kindergartens in Gaza, majority living in refugee camps, exposed to different war traumatic events during the second Intifada (N=308)	3-6 years Mean=4.7	Gaza Traumatic Checklist – Parent Form Strengths and Difficulties Questionnaire (SDQ) Behaviour Checklist (BCL)		<u>1 month prevalence</u> : Faddy eating: 36.6% Difficulty settling at night: 29.1% Sleeping with parents: 30.4% Overactivity: 25.2% Dependency: 24.6% Poor concentration: 17.5% Temper tantrums: 16.2% Worries: 16.5% Fears: 14.2%
Elbedour et al. (2007)	2002	Representative sample of school adolescents living in refugee camps in Gaza exposed military violence for almost 2 years during the second Intifada (N=229)	15-19 years Mean=17.1	Post-traumatic stress disorder interview (PTSD-I) Beck Depression Inventory-II (BDI-II) Beck Anxiety Inventory (BAI) Coping Responses Inventory (CRI-Youth Form)		<u>1 month prevalence</u> of PTSD: 69% Moderate-severe depression: 40.0% Moderate anxiety: 5.1% Severe anxiety: 95% Undesirable coping responses : 70%

Giacaman, Abu-Rmeileh, et al. (2007)	2003	Representative sample of school adolescents from the Ramallah District, West Bank, exposed to intense military violence during the second Intifada (N=3415); same sample as that in Giacaman, Shannon, et al. (2007)	15-18 years	Gaza Traumatic Event Checklist- Revised Subjective health complaints questionnaire based on the World Health Organization's Health Behavior in School-aged Children Survey (HBSC)	Prevalence of high levels of subjective health complaints (4 or more per week): Those who were never exposed to humiliation: 21% Those who were exposed to 3 forms of humiliation: 52% Those who were exposed to 4 forms of humiliation: 62%
Giacaman, Shannon, et al. (2007)	2003	Representative sample of school adolescents from the Ramallah District, West Bank, exposed to intense military violence during the second Intifada (N=3415)	15-18 years	Individual and collective exposure to violence and trauma scales developed by the authors Gaza Traumatic Event Checklist-Revised Depressive-like state scale based on DSM-IV criteria Subjective health complaints questionnaire based on the World Health Organization's Health Behavior in School-aged Children Survey (HBSC15)	Depression (using conservative criteria): 6.5% Depression (using less conservative criteria): 14.9% Depression in girls: 8.2% Depression in boys: 4.6%
Qouta et al. (2007)	1993 (last months of the first Intifada); 1996; 2000 (just before the second Intifada)	Randomly selected community-based sample of adolescents from Gaza who had experienced intense military trauma events during the first Intifada (N=65); most likely same sample employed in Punamäki et al. (1997), Punamäki et al. (2001) and Qouta et al. (2001)	Mean=17.6 years at T3 T1: 1993 T2: 1996 T3: 2000	PTSD Reaction Index (PTSD- RI), adolescent version Beck Depressive Index (BDI), the 13-item version; Adolescent Resiliency Attitudes Scale (ARAS; Biscoe & Harris, 1999) Health-Related Quality of Life (HRQoL) (Ware & Gandek, 1998)	No prevalence data
Abdeen et al. (2008)	2004-2005	Representative national sample of high school students who had been exposed to war-like traumatic events; 65% of the sample from the West bank and 35% from Gaza (N=2100)	14-17 years	Haj-Yahia's 40-item Political Violence Inventory was used to assess exposure to war-like events Emotional reactions to exposure (such as extreme fear, helplessness, or horror) were assessed with items derived from the DSM-IV-TR UCLA PTSD Index adolescent version (adapted) derived from DSM-IV PTSD symptom criteria Functional Impairment Questionnaire derived from the Child Diagnostic Interview Schedule Hopelessness scale for children; Somatic complaints checklist; Brief COPE;	<u>1 month prevalence</u> Full PTSD (according to DSM-IV-TR criteria): 35.7% Partial PTSD: 11.7% ----- Mild hopelessness symptoms: 10% Moderate hopelessness: 58% Severe hopelessness: 32%
Khamis (2008)		Sample of Palestinian boys who were injured during the 2nd intifada and as a result developed permanent physical disabilities; 30.2% were from the West bank and 69.8% from Gaza (N=179)	12-18 years Mean= 16.3	Structured clinical interview based on DSM-IV diagnostic criteria for PTSD; Revised Children's Manifest Anxiety Scale (RCMAS); Beck Depression Scale; Kidcope for assessment of coping strategies; Parental Support Scale; Fatalism Scale developed by the author for the study;	Full PTSD: 76.5%
Thabet et al. (2008)	-	Convenient sample of children in Gaza exposed to regular shelling for six months prior to data collection (N=197)	9-18 years	Gaza Traumatic Events Checklist Children's Revised Impact of Events Scale (CRIES-13) Revised Children's Manifest Anxiety Scale (RCMAS) Strengths and Difficulties Questionnaire (SDQ)	<u>6 months prevalence (PTSD & symptoms)</u> PTSD: 70.1% Insomnia: 40.5% Exaggerated startle: 39% Trying to remove memories from their mind: 39% ----- Anxiety: 33.9% ----- Broad mental health morbidity: 42.7% Conduct problems: 36.8% Hyperactivity: 22.8% Emotional problems: 24.4% Peer relationship problems: 60.1%

Mental Health Outcomes for War Exposed Children

	Espié et al. (2009)	2005- 2008 (calm period)	Clinical sample of children who had a lifetime exposure to traumatic war and non-war events, and were enrolled in the MSF program in Gaza and Nablus district of the West Bank from 2005 to 2008 (N=619)	≤ 15 years	A standardized questionnaire was used to collect data about lifetime exposure to adverse events Clinical evaluation using a semi-structured interview based on criteria from DSM-IV-TR	PTSD: 25.8% Anxiety disorders (other than PTSD & acute stress disorder): 18.3%
	Massad et al. (2009)	2007	Randomly selected sample of preschool children kindergarten-based in Gaza exposed to war traumatic events during the last months of the 2nd intifada (N=350)	3-6 years	Gaza Traumatic Event Checklist Strength and Difficulties Questionnaire	Poor mental health: 29% Conduct problems: 52% Emotional problems: 19% Peer relationship problems: 17% Hyperactivity: 3%
	Thabet et al. (2009)	During the second Intifada	Randomly selected sample of school adolescents in Gaza exposed to a number of war traumatic experiences for two years during the second Intifada (N=412)	12-16 years Mean=13.7	Gaza Traumatic Event Checklist Structured Clinical Interview for DSM-IV, PTSD module	PTSD (following DSM-IV diagnostic criteria): 30.8% Intrusive recollections: 81.6% Distressing dreams: 80.8% Being upset by reminders of the event: 79.6% Flashbacks: 74% Avoidance of thoughts: 65.1% Exaggerated startle: 64.8% Sleep difficulty: 63.6% Psychic numbing: 46.6%
	Dubow et al. (2010)	–	Community-based representative sample of children and adolescents who were exposed to ethnic-political conflict and violence besides exposure to conflict and violence in other contexts (family, community, school) during a year prior to data collection (N=600) divided equally into three age groups: 8, 11, & 14 years); 2/3 of the sample was from the West Bank and 1/3 was from Gaza; close to ½ reported an income below Palestinian average	3 age groups: 8, 11, and 14 years	Exposure to ethnic-political conflict and violence scale adapted from Slone et al. (1999) Exposure to community violence scale derived from Attar et al. (1994) & Barber (1999) Exposure to school & inter-adult family conflict and violence scale/ measure taken from Attar et al. (1994) Child Post Traumatic Stress Symptoms Index Peer report of aggression (modified version of the Peer Nomination of Aggression Inventory) Severe Physical Aggression scale Child Behavior Checklist- Aggression scale	<u>1 month prevalence:</u> High frequency of PTSS: 20% Moderate-high frequency of PTSS: 33.3% <u>6-12 months prevalence:</u> Aggressive behavior: 22%- 33%, depending on the scale used
	Massad et al. (2011)	2007	Randomly selected sample of preschool children kindergarten-based in Gaza exposed to war traumatic events during the last months of the second Intifada (N=350); same sample as that of Massad et al. (2009)	3-6 years	Gaza Traumatic Event Checklist Strengths and Difficulties Questionnaire (SDQ) Pediatric Quality of Life Inventory (PedsQL 4.0) parent report, Arabic version	Poor mental health: 37% “Severely impaired” health-related quality of life: 65%
	Punamäki et al. (2011)	1996	Random sample of school children from Gaza who had a lifetime exposure to war traumatic events; almost ½ lived in urban areas (N=640)	6-16 years divided as : 64.5%: 6-11 years; 12.6%: 12–13 years; 20.9% : 14-16 years	War Trauma Questionnaire Ontario Child Health Scale Health Utilities Index Mark 2	<u>6 months prevalence:</u> 1 of 3 disorders (emotional, conduct disorder, ADHD): 30.6% 2 of 3 disorders (emotional, conduct disorder, ADHD): 9.2% 3 of 3 disorders (emotional, conduct disorder, ADHD): 4.8% ----- Traumatized children: 23% Resilient: 21% Vulnerable: 23%
	Kolltveit et al. (2012)	2009	A random sample of 139 school students aged 12-17 in Gaza	12-17 years	The Gaza Traumatic Check List, Revised Child Impact of Event Scale for PTSD, Revised Children’s Manifest Anxiety Scale, Depression Self-Rating Scale for Children	56.8% scored within the clinical range of the CRIS-8 scale which assessed PTSD. 23.7% and 41.2% of the sample respectively scored above the clinical cut-offs for the anxiety (RCMAS) and depression (DSRS) scales.
Somalia	Kia-Keating & Ellis (2007)		A non-random community-based sample of Somali adolescent refugees who have resettled in the US and were currently living with family members (N=76); possibly a subset of the sample in Ellis et al. (2008)	12-19 years Mean= 15.6	War Trauma Screening Scale (WTSS) UCLA PTSD Index for DSM-IV (PTSD-I) Depression Self-Rating Scale (DSRS)- Adolescent Version Multidimensional Scales of Perceived Self-Efficacy (MSPSE)	No prevalence data

	Ellis et al. (2008)		A community-based sample of Somali adolescent refugees who have resettled in the US and were currently living with family members (N=135)	11-20 years Mean= 15.4	Psychological Sense of School Membership (PSSM) Scale War Trauma Screening Scale (WTSS) Adolescent Post-War Adversities Scale- modified version Acculturative Hassles Inventory - Family Hassles subscale Every Day Discrimination Questionnaire UCLA PTSD Index for DSM-IV (PTSD-I) Depression Self-Rating Scale (DSRS)- Adolescent Version	No prevalence data
Sudan	Paardekooper et al. (1999)	1995-1996	Random sample of exposed Sudanese war refugee children who fled to Uganda (N=316), compared to a control group of Ugandan children (N=80); most likely exposed to the war between government forces in the north and rebels in the south	7-12 years Mean= 9.4	Trauma Event Scale - a subscale of the Harvard Trauma Questionnaire Daily Stressors Inventory Revised KidCope "Michael-questionnaire" revised form of the Levonn Cartoon-based Interview for Assessing Children's Distress Symptoms WHO Reporting Questionnaire for Children (RQC)	No prevalence data
	Geltman et al. (2005)	-	Convenient sample of unaccompanied Sudanese war refugee minors who resettled in the US and were enrolled in refugee foster care programs (N=304); Most likely exposed to the Darfur war	Mean=17.6 years	Questionnaire developed by the authors to assess migration history & exposure to traumatic events Harvard Trauma Questionnaire (HTQ) Child Health Questionnaire (CHQ)- short form	PTSD: 20% PTSD children had significantly deteriorated health-related quality of life compared to non-PTSD
	Morgos et al. (2008)		Randomly selected sample of Sudanese refugee children representative of the internally displaced school-based children population from different villages in Southern Darfur, and living in refugee camps; Gp1 (N=189), Gp2 (N=142)	6-17 years Gp1: 6-12 years Gp2: 13-17 years	A questionnaire developed by the authors was used to collect data on war experiences; Child Post Traumatic Stress Reaction Index (CPTSD-RI); Children's Depression Inventory (CDI); The Expanded Grief Inventory (EGI);	PTSD symptoms: 75% Depressive symptoms: 38% Depression in girls: 55% Depression in boys: 25% Grief symptoms: 16%
Syria	Karam et al. (manuscript in preparation)	2013-2014	A convenient sample of Syrian refugee children and adolescents attending public schools in Lebanon (N=547).	Mean=11.9 years	A questionnaire developed by the authors was used to collect data on war experiences Child Depression Inventory (CDI) Screen for Anxiety Related Disorders- Child version (SCARED); PTSD Reaction Index;	Depression: 16.8% Anxiety: 56.0% PTSD: 4.7%

Non-War Related Childhood Adversities in the Arab World: A Review

John Fayyad, Joanna Diab, Nada Yousef, Claudia Farhat, Elie G Karam

الشّدائد والمحن خلال الطفولة في العالم العربي: مراجعة شاملة

جون فياض، جوانا دياب، ندى يوسف، كلوديا فرحات، ايلي ج كرم

Abstract

Childhood adversities are widely experienced across the globe and have recently been the focus of a significant increase in public awareness due to the growing number of referred cases and accessible intervention programs. Childhood adversities increase the risk of short and long-term detrimental effects on academic performance, social relationships and physical and mental health. The current paper focuses on the experiences of Arab children, particularly in the countries of Lebanon, Jordan, Palestine, Kuwait, Bahrain, Egypt, Saudi Arabia, Yemen and Sudan. Several quantitative and qualitative research studies have emerged on non-war related childhood adversities in the Arab world between the years of 1989 and 2015. The present review aims to summarize the current literature and discuss the outcomes of childhood adversities and implications for policies and prevention.

Key words: Childhood adversities, Arab, physical abuse, sexual abuse, maltreatment

Declaration of interest: None

Introduction

Past research has shown the strong association between childhood adversities and mental health. Adversities refer to any form of serious or continued difficulty or misfortune. Examples of childhood adversities include child abuse (whether physical, psychological or sexual), neglect, polygamy, parental psychopathology, parental death, parental occupational or educational level, socio-demographics and/or parental relationship.

Method

The existing peer-reviewed literature was the primary source of information for the current review.

Keywords

The articles included in the current review were identified by searching for the following keywords: child, childhood, childhood adversities, abuse, child neglect, child maltreatment, children, adolescent, parents, parent death, divorce, multiple marriages, parent separation, parent loss, mental health, mental illness, substance abuse, criminal, violence, physical abuse, sexual abuse, neglect, economic adversity, divorce, polygamy.

Search Engines

The search engines used to identify articles containing these keywords were PsycINFO, PubMed, and the

IDRAAC database. The countries included in the search were: Algeria, Bahrain, Egypt, Gaza, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates (UAE), and Yemen. The regions included were Arab, Gulf, and Middle East. The search was not restricted to any language.

Results

Child abuse

Child abuse refers to “all forms of maltreatment, being physical, emotional, or sexual in nature, in addition to neglect or any exploitation to fulfill economical purposes, all of which in turn lead to the harming of a child’s health, survival and/or dignity in the context of a relationship of responsibility, trust, or power.”¹ The prevalence of child abuse varies in different circumstances depending on factors such as cultural diversity, the research methods implemented and the instruments used to conduct the study.

Children in the Arab world are exposed to all forms of abuse. Nonetheless the problem is often ignored and put aside without the endorsement of prevention plans. Abused children, therefore, continue to suffer while the abusers go unpunished.¹ Prevalence studies tackling child abuse, particularly sexual abuse, remain unreported and incomplete. Additionally, inconsistent information is often provided. To overcome these issues, surveys in the

form of questionnaires and interviews are implemented. A noteworthy difficulty is the underreporting of official statistics that tend to deflate real numbers and downplay the reality of problems, which are becoming more common in the Arab world.

Sexual abuse

As defined by the World Health Organization (WHO), “child sexual abuse (CSA) is the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared, or that violate the laws or social taboos of society”.

Elbedour *et al.*² studied the rates of sexual abuse among a non-representative sample of N=217 female high school students aged 14 to 18 year old in a Bedouin Arab community in Southern Palestine. The revised Arabic version of Finkelhor’s scale was administered, which measures various kinds of sexual encounters such as kissing and hugging, exposure of the sexual organs, touching genitals, and intercourse with or without penetration, all of which were found to have occurred against the will of the victim; 53.3% of participants had experienced at least one form of sexual abuse, the most frequent one being an invitation or sexual request (16%).

In another cross sectional study, which surveyed N=652 undergraduate Palestinian students aged between 18 and 37 years old, Haj, Yahia and Tamish³ found, also using the revised Arabic version of Finkelhor’s scale, that 18.6, 36.2, and 45.6% of the students were exposed to at least one act of sexual abuse by a family member, relative or stranger respectively since early childhood.

Usta *et al.*⁴ conducted a cross sectional study on 1028 Lebanese children aged 8 to 17 years old from primary healthcare centers in Lebanon to investigate the prevalence and consequences of CSA and its risk factors before, during and after the 2006 Hezbollah-Israeli war. Different instruments were used in the study, namely, the International Child Abuse Screening Tool, the Trauma Symptom Checklist, and the Family Functioning in Adolescence Questionnaire. Results of the study showed that the prevalence of CSA before the war was 11%, 5% during the 33-day war, and 8% in the one-year period after the war. These incidents involved mainly sexual attempts, sexual acts, or exposure to sexual media and were, in 66% of cases, carried out by non-family members and mostly in the Northern area of Lebanon.

A retrospective, descriptive study was carried out in Bahrain by Al-Mahroos *et al.*⁵ The study was based on reviewing the medical records of 440 children at Sulmaniya Medical Complex diagnosed with CSA between the years of 2000 and 2009; 50.5% of

participants were boys and 49.5% were girls and the mean age of the participants was eight years. CSA was found to have occurred in 89% of the cases and the abuse mainly took place in the family or in relatives’ homes (53%). It was reported that genital touching and fondling (62.5%) was the most common form of abuse followed by sodomy (39%) and genital penetration (22% of girls). A steady increase in CSA cases was noted, moving from 31 cases per year in 2000 to 77 cases per year in 2009.⁵

Shotar *et al.*⁶ administered a retrospective case-series study of reports on sexual offenses that were referred to the Forensic Medicine Teaching Center in Northern Jordan (FMTNJ) Irbid. From the 394 cases that were reviewed, 36.1% of the examinations reported experiences of CSA between the years of 2003 and 2007; 53.0% of the sexual abuse victims were boys, and the male to female sex ratio was 1.3:1. The subjects of the study ranged between 3 and 18 years old with a mean age of 12.5 and a median age of 14.06. Moreover, Jumaian⁷ administered Arabic versions of the General Health Questionnaire and a self-administered questionnaire for the contact form of CSA to 100 male college students in Jordan. Participants ranged from 18 to 20 years old. Results found that 27% of the subjects had a history of CSA before the age of 14 by an adult who was at least five years older than themselves. It is important to note that those who had experienced CSA reported more mental health problems compared with those who had not experienced it.⁷

Itani *et al.*⁸ administered the Composite International Diagnostic Interview (CIDI) to 2857 adult participants from the nationally representative sample used in the Lebanese Evaluation of the Burden of Ailments and Needs of the Nation (L.E.B.A.N.O.N) study.⁹ It was reported that 0.4% of the participants were sexually abused during childhood, 0.2% of whom were men and 0.6% were women.

Finally, Kudrati *et al.*¹⁰ conducted a study using interviews and street surveys which focused on the daily lives of street children. The sample included 872 current and former Sudanese street children below the age of 18. One percent of the boys and 14% of the girls reported sexual violence as their greatest challenge on the streets, whereas 8% and 14% of boys and girls, respectively, reported physical abuse as their greatest challenge. Perpetrators of abusive treatment were reported to include police (51% and 31%), other adults (2% and 6%) as well as other street boys (5% and 17%).¹⁰

Physical abuse and corporal punishment

Corporal punishment is defined as the intentional inflicting of physical pain without causing injury for a perceived misbehavior, intended to modify this behavior.

Corporal punishment includes shaking, spanking, pinching, and hitting with objects.¹¹ This form of punishment can vary: it can be moderate when spanking and slapping the buttocks or the face or it can be more severe when it involves hitting other body parts, burning, or beating the child. Corporal punishment is still practiced all around the world and its use is widespread despite the creation of legislation and The Convention of the Rights of the Child by UNICEF. Physical abuse, however, is defined an act that results in actual or potential harm which is reasonably within the control of a parent or person in a position of responsibility, power or trust.

Lansford *et al.*¹² conducted a study on 1417 children (aged 7 to 10 years) in nine countries, one of which was Jordan, examining corporal punishment as a function of child gender and parent gender. Interviews were administered in the participants' homes, schools, or other locations chosen by the participants. The participants were given the option to participate orally or in writing. The researchers found that 54% of girls and 58% of boys had experienced mild corporal punishment in their lifetime, and that 13% of girls and 14% of boys experienced severe corporal punishment by their parents or someone in their household in the last month prior to the study. Oddly, only 17% of parents believed that corporal punishment was necessary to rear children.

Abolfotouh *et al.*¹¹ conducted a school-based study whereby 400 Egyptian children, aged 9 to 14 years, were selected using simple random sampling from six primary schools in Alexandria. It was found that 76.3% of the children were corporally punished at home and 46.2% were punished on areas different than the buttocks and extremities. Boys were more likely to be physically punished (85.4%) than girls (71.9%). Furthermore, 39% of the students were punished once or twice per week and this type of punishment did not leave marks in 62% of the participants, but did leave clear marks in 3% of the participants. The reasons for physical punishment were also identified in the study and found to be primarily related to the child's disobedience (57%).¹¹

Youssef *et al.*¹³ also conducted a study on children experiencing violence from their parents. The study was conducted on a school-based representative sample of 2170 Egyptian students between the ages of 10.5 and 20 years. Another study¹³ found that 37.4% of the subjects reported corporal punishment and verbal aggression by parents. Parents usually used their bare hands (71.21%), belts, sticks, or slippers and shoes as means for beating; 4.18% of the participating children were punished via skin burning and scolding and 25.83% reported physical injuries (concussions, bumps and wounds mostly) due to corporal punishment, leaving the majority of children

(74.17%) with no associated physical harm. Youssef *et al.*¹³ again conducted a study on the same representative sample surveying targeted preparatory and secondary public school students. Self-administered questionnaires completed for the study indicated that 79.96% of boys and 61.53% of girls were corporally punished by their teachers. Students were subjected to the use of sticks (94.84% of boys, 89.71% of girls) and hands (28.33% of boys, 16.69% of girls) as a means of corporal punishment. The use of straps, kicks and shoes was rarely used (1%), and the hands and arms were the primary site of punishment (90.33% and 90.09% of boys and girls, respectively). Physical injuries were found in 26.45% of boys and 18.45% of girls and the injuries consisted mainly of bumps and contusions followed by wounds.¹³

In Palestine, another study¹⁴ with 1185 school students between the ages of 14 and 20 years was implemented using the Arabic version of Conflict Tactics Scales (CTS). The CTS evaluates verbal and psychological aggression and physical violence to measure the rates of violence and the witnessing of aggression. It was found that 31.4% and 25% of the participants reported experiencing some form of physical abuse at least once during their childhood by their fathers and mothers, respectively.¹⁴

Similarly, a cross-sectional survey was conducted on 1640 adolescents between the ages of 16 and 18 years from seven different villages and towns in Israel.¹⁵ The Arabic version of the CTS was used to examine the incidences and different patterns of physical abuse and violence among Arab adolescents in Israel. It was found that 17% of the students were beaten by the fathers, 15% by the mothers, and 20% by siblings in the 12 months prior to the study. The weapons used included sticks, clubs and/or other harmful objects. Elbedour *et al.*² similarly conducted an exploratory study on the abuse of adolescents in a Bedouin-Arab community in southern Israel. Participants completed self-administered surveys, which measured demographic characteristics and psychological abuse. Sexual and physical abuse was measured using the Finkelhor's Scale. It was found that 43.7%, 44%, 37.1%, and 32.3% of participants experienced some type of physical abuse by their mother, sibling, father and teacher, respectively.

Ibrahim *et al.*¹ conducted a cross sectional study on 1897 Saudi female university students. The Standardized Arabic Version of the Child Abuse Screening Tool for Young Adults was administered. Results revealed that physical abuse was experienced by 45.1% of participants and the abuse consisted of pulling the hair or pinching the ears (27.3%), slapping (20.5%), hitting (18.6%) and beating by objects (18%). Burning and stabbing were

also reported in 4.6% and 2.2% of cases and permanent scars were evident in 16.4% and 12.5% of the cases, respectively. Parents were found to be the most common perpetrators of physical and emotional abuse.¹

Finally, a study in Lebanon using the CIDI with 2857 adult participants comprising a nationally representative sample found that 4.4% of the participants experienced physical abuse from parents or caregivers during their childhood, 4.7% of which were men and 4.2% women.

Psychological abuse

Psychological or emotional abuse is the most concealed form of maltreatment. This is because the injuries from this kind of abuse are unseen. However, psychological abuse can have severe consequences on a child's health and/or physical, mental, spiritual, moral or social development; these acts of abuse consist of restriction of movement, patterns of belittling, and denigrating, scapegoating, threatening, scaring, discriminating and ridiculing.¹⁶ Two studies^{17,18} considered emotional abuse a problem, which receives minimal attention from educators, researchers, and administrators. This type of abuse is thus the most difficult to research. In another study,¹⁶ a convenience sample of 60 children, aged 12 to 18 years, were recruited from three malls in Jeddah, Saudi Arabia. Parents consented to their children completing self-administered questionnaires and results showed that 90% of the participants reported having experienced at least one form of emotional abuse.

Haj-Yahia and Arie¹⁵ examined psychological aggression towards participants in a sample of 1640 Arab students in secondary school in Israel. The participants were subjected to a cross-sectional survey and the results showed that 38%, 41% and 52% of the participants' fathers, mothers and siblings respectively insulted, yelled or swore at them at least once during the period of the survey.

Additionally, Khamis *et al.*¹⁹ cited two-parent households as a predictor of psychological maltreatment in their school-based study on Palestinian children. Also, parents who felt that they were not adequately wealthy were more likely to emotionally abuse their children. Other salient predictors of psychological abuse reported by Khamis¹⁹ included harsh discipline, and lack of parental support. Elbedour *et al.*² similarly highlighted psychological abuse in an exploratory study conducted on adolescent girls in a conservative Bedouin-Arab community in southern Israel. It was found using a self-administered survey, measuring demographic characteristics and psychological abuse, that more than 50% of the participants reported being psychologically abused. The abuse was primarily carried out by their

siblings (60.9%) followed by mothers (54.2%) fathers (48.9%) and teachers (42.4%).

Vivian Khamis *et al.*¹⁹ had two counselors carry out interviews with Palestinian children. The interview measured psychological maltreatment in a school-based representative sample of 1000 Palestinian girls between 12 and 16 years old. It was found that 16.4% of the female participants reported psychological abuse. Ibrahim *et al.*,¹ in the cross-sectional study on Saudi female university students also stated that participants reported a history of being insulted or criticized in 44.5% of cases, not loved in 13.9% of cases and rejected by the family in 12.4% of cases.

Finally, Saddik *et al.*²⁰ conducted a study with 1066 pupils from eight schools in the Aden Governate in Yemen, aged 12 to 17 years old, to evaluate the prevalence and risk factors of emotional abuse. For this purpose, a multi-stage stratified random sampling was used and an anonymous self-administered questionnaire adapted from the Arabic Version of Child Abuse Screening Tool Children's Institutional Version was administered. This instrument consists of two parts. The second and relevant part to the study included 10 items concerning emotional abuse: humiliation, shouting, calling names, embarrassing them about being an orphan, poor, having health problems, threatening bad marks, expelling from school, isolating them from other children and destroying their belongings. It was found that 55.2% of pupils reported emotional abuse and teachers were responsible for 45.6% of these acts with the most common type of abuse being shouting (48.1%).

Neglect

Neglect refers to the failure to provide a developmentally appropriate, supportive environment, including the availability of a primary attachment figure.²¹ Neglect is generally defined as the state or fact of being uncared for. Al Eissa *et al.*²² collected data retrospectively from all children evaluated by the Suspected Child Abuse and Neglect team (SCAN) at the King Abdul Aziz Medical Center in Saudi Arabia from the years 2000 to 2008. N=188 cases were referred to the SCAN team from which n=133 (70.9%) were proved to be child abuse and neglect cases and were divided as the following: 53.4% male cases, 48.9% as physical abuse, 15% sexual abuse, 3.8% emotional abuse and 32% as neglect. Parents were the most common perpetrators (48.9%) followed by siblings (13.5%). It was found that the total number of referred cases increased from 6.4 cases per year in the 2000-2004 period to 16.5 cases per year in the 2005-2006 period and to 61.5 cases per year in the 2007-2008 period. According to the study, this was due to interventions for better recognition of child abuse and

neglect in Saudi Arabia.²² Additionally, results found by Itani *et al.*⁸ in Lebanon also showed that 1.6% of the participants were neglected during childhood, 1.4% of which were male, and 1.7% were female.

Parental psychopathology

Itani *et al.*⁸ administered the CIDI to 2857 participants of a nationally representative sample in Lebanon. The authors reported that 12.4% of participants were exposed to parental psychopathology during childhood, 10.1% of which were male, and 14.6% were female. 11.1% of those participants' parental psychopathologies were related to parental mental or substance use disorders, whereas 1.4% of the participants were exposed to parental criminal behavior. Females were more likely to report parental mental or substance use disorders (12.8%) compared to males (9.5%). Females were also more likely to report witnessing family violence (0.9%) compared to males (0.3%).

Using the World Health Organization (WHO) CIDI to assess mental disorders and suicidal behavior and the Family History Research Diagnostic Criteria Interview to assess Parental psychopathology, Gureje *et al.*²³ reported in a cross-national World Mental Health survey, which included Lebanon, that the specific disorders of Generalized Anxiety and Depression in parents were the only disorders associated with suicidal plans among the children. On the other hand, parents with antisocial personality and anxiety disorders (particularly GAD and panic) were predictors of the suicide attempts among children. It is important to note that parental suicide was associated with suicidal behavior in the child only when the parent and the child belonged to the same gender.²³

Predictors of childhood abuse

Gender

Many studies have illustrated how child abuse in the Arab world is more common among boys than girls.^{11,12,13,15} However Kudrati *et al.*¹⁰ found that street girls experienced more sexual violence than street boys. Additionally, Fayez *et al.*²⁴ found that girls were more likely to be abused by their mothers and boys by their fathers, emphasizing the importance of culture and sexual segregation in the Arab world.²⁴ It is noteworthy that a study conducted by Al-Mahroos *et al.*²⁵ showed that boys were mostly affected by physical abuse (63%) whereas girls were the primary victims of sexual abuse (55%). As for emotional abuse, Saddik *et al.*²⁰ in his study in Yemen mentioned above, reported that boys had higher prevalence rates than girls concerning this type of childhood abuse.

Polygamy

Polygamy refers to the tradition of having more than one wife or husband at the same time. Elbedour *et al.*²⁶ described the traditional practice of polygamy in the Bedouin Arab families and showed how this practice is an important factor in marital conflicts, family violence and family disruptions. Elbedour *et al.*²⁶ also tested the claim that polygamous family structures can be a risk factor for children's school maladjustment and negative developmental outcomes. Two hundred and fifty five third-grade children were assessed, 153 of whom came from monogamous families and 102 from polygamous families. The children's teachers completed the Teacher's Report Form of the Child Behavior Checklist and results showed that children in families where father's had two wives had higher levels of externalizing problems and higher levels of attention problems than did children of monogamous families. Additionally, higher rates of school absenteeism and lower levels of academic achievement (falling before the average of 78%) were evident in children from polygamous families. Elbedour *et al.*²⁷ also studied the effect of family structure on the mental health and self-esteem of 210 adolescents in the same Bedouin-Arab community. No differences were found in the children's anxiety, depression, hostility, or psychopathological symptoms; however, participants with fathers who had three or four wives were more likely to display symptoms of psychopathology compared to those from monogamous families.²⁷ Moreover, Al-Krenawi and Graham²⁸ found that children of polygamous families were reported as being disobedient, hyperactive, untruthful and likely to fight with siblings.²⁷

Saddik *et al.*³⁰ in his study in Yemen reported that living in an extended family is a risk factor for emotional abuse. Moreover, the mental health of Arab-Israeli adolescents in the Arab neighborhood of Ramla in central Israel was compared between those from monogamous families and those from polygamous families.²⁸ In the study, 101 Arab Muslim adolescents were chosen from grades 6, 7, and 8 at the Elementary School of Juarish. The sample consisted of 19 students from polygamous families and 82 students from monogamous families. Results showed that participants from polygamous families had lower self-esteem scores and higher scores in all Brief Symptom Inventory dimensions, which include somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism.²⁸

Another study by Krenawi and Slonim-Nevo²⁹ assessed 352 Bedouin Arab children between 13 to 15 years old from grades 7 to 9 in 11 junior high schools in Negev, Israel. Using random selection, 174 participants came

from monogamous families and 178 from polygamous families. The monogamous and polygamous groups comprised 50% and 47% boys, respectively. Participants were administered self-report questionnaires in Arabic and Arabic versions of the Rosenberg Self-Esteem scale, the Brief Symptom Inventory (BSi), the Hudson scale of father-child relationships and mother-child relationships and the McMaster Family Assessment Device. Also, the children's academic achievements were assessed by their average school grades in the subjects of English, Arabic, Hebrew, and Arithmetic. Results found that children of first wives from polygamous families had more mental health problems than those from monogamous families. Additionally, children of polygamous families showed more educational and social difficulties, and with the exception of anxiety, higher levels of psychiatric symptomatology, including somatization, obsession compulsion, depression, interpersonal sensitivity, hostility, phobic anxiety, paranoid ideation and psychosis. Their GSI (General Severity Index), PSDI (Positive Symptom Index), and PST (Positive Symptoms Total) levels were all higher as well. Findings also reported poorer academic achievement among those from polygamous families. Conversely, in both polygamous and monogamous families, better family functioning was associated with higher levels of self-esteem in participants and better peer relations and mental health. Therefore, it is suggested that family structure in itself is not detrimental to children's self-esteem and psychosocial behavior, but rather it is the level of family functioning that impairs the children's adjustment. Economic status was also a predictor of family functioning and children's mental health. Children's adjustment was not affected in polygamous families whose economic status was good.

Hamdan *et al.*³⁰ collected data from six schools in Bedouin communities in Southern Israel to test the effect of polygamy on the mental health of adolescents. 406 students from grades 7 to 12 were surveyed and assessed based on a demographic questionnaire, the Youth Self-Report (YSR), the Revised Children's Manifest Anxiety Scale (RCMAS) and the Children's Depression Inventory (CDI). Overall, 56% of the participants were girls, and 47% of the participants were from monogamous families. Surprisingly, and inconsistent with various studies, Hamdan *et al.* (2009) found no differences between the psychopathology of children from monogamous and polygamous families.

Parents' occupational or educational level

Studies support the hypothesis that severity and frequency of child abuse is directly related to the low

occupational level of the father.^{4,14,31} A study by Saddik *et al.*²⁰ reported that having a father with higher educational level constituted a protective factor for emotional abuse. However, El Bedour *et al.*⁶ conducted a study in a Bedouin Arab community in Southern Israel and found a positive correlation with fathers' higher occupational level and frequency of sexual abuse. Still, Haj Yahia and Tamish³ found no significant correlations in terms of sexual abuse and socio-demographics when examining a convenient sample of 652 college-based Palestinian students.

Parental relationship

According to Ibrahim *et al.*,¹ the predictors of exposure to any form of abuse include mainly parents who hit each other, parental psychiatric problems and separated parents. Parental separation/divorce was also found to be a predictor of child abuse on a random sample of Kuwaiti high school students.²⁴ The quality of parental relationships thus appears to be as an important predictor of abuse. Karam *et al.*³² examined the effectiveness of a classroom-based psychosocial intervention with 2500 students from six villages in post-war Southern Lebanon. The Diagnostic Interview for Children and Adolescents was used to measure mental disorders and psychosocial stressors and the War Events Questionnaire was used to measure war exposure; 116 students out of the 2500 were randomly selected to represent the larger population. Participants were assessed one month and one year post-war. The authors reported that family violence parameters such as witnessing parental quarrels and fear of being beaten were significantly related to post-war disorders such as Major Depressive Disorder (MDD) and Separation Anxiety Disorder (SAD), with Odds Ratios (OR) that are higher than those for witnessing war events. For example, for post-war MDD, the OR of witnessing family quarrels was 3.1 whereas that of witnessing war events was 2.1; for post-war SAD, the OR of fear of being beaten was 5.4 whereas that of witnessing war events was 2.9.

Outcomes of child abuse

Al-Mahroos *et al.*³³ explored the reactions of victims of punishment and emotional abuse and correlated them with anger, dislike of school, low self-esteem, depression, desire for revenge, and indifference. Al-Mahroos *et al.*³³ also found that corporal punishment at school affected school performance. In their study, 60% of abused students reported disliking school, 67% were angry, 25% developed low self-esteem, 25% wanted to take revenge and 24% were depressed. Only 10% of the abused students expressed indifference. Fayez *et al.*²⁴ also reported that children with difficulties in studies and social relationships had significantly higher total abuse

scores. Similarly, Ibrahim *et al.*¹ related poor educational performance, more suicidal ideations, symptomatic pain, fear of the opposite gender, and acquiring violent behavior as outcomes of physical abuse.

Nonetheless, Abolfotouh *et al.*¹¹ aimed to find if any correlation is present between corporal punishment of children and their self-esteem, but no statistical significance was found. However, corporally punished children did report lower scores on their relationships with others compared to the non-corporally punished. These were determined using the Arabic version of the Coppersmith Self-Esteem Inventory.

Discussion

The findings of the studies reviewed above show that childhood adversities are highly prevalent in Arab society, even despite the underreporting of cases. Child abuse was generally related to more mental health problems and academic difficulties in victims. The perpetrators were parents, teachers, siblings, relatives and strangers; however, there was no clear generalizable prevalence for each throughout the literature. It was found that boys were more likely to be physically abused whereas girls were more likely to be sexually abused. There were mixed results on whether fathers abused their children more than mothers, but generally fathers beat their children more than mothers while mothers psychologically abused their children more than fathers. Gender was a moderator of suicidal behavior in victims of abuse. It was found that parental suicide predicted suicidal plans in the child when the parent and the child belonged to the same gender. Specific disorders of generalized anxiety and depression in parents were the only disorders associated with suicidal plans among the children whereas parents with antisocial personality and anxiety disorders were predictors of the suicide attempts among children. Polygamy was also a moderator as it resulted in higher levels of externalizing problems, higher levels of attention problems, higher rates of school absenteeism, and lower levels of academic achievement in children compared to those from monogamous families. Also, participants with three or four stepmothers were more likely to display symptoms of psychopathology compared to those from monogamous families. The occupational level of the father was not consistently related to the mental health of the children and, therefore, it is not easy to generalize the results across samples. This may have been due to the different methodologies used. Only a few studies investigated the outcomes of maltreatment, finding that poor educational performance, more suicidal ideation, symptomatic pain, fear of the opposite gender, and

acquiring violent behavior were all reported as outcomes of physical abuse. It is important to note however that stressors will collectively impact the mental health of the victims. As mentioned by Itani *et al.*,⁸ negative situations rarely happen in isolation or in a vacuum, therefore, it is important to study and report the conclusive effects of associations between multiple adversities together.

Prevention and implications

Programs are provided for parents that include strategies on ways to deal with daily stressors via more effective coping and communication. According to Graeff-Martins *et al.*,³⁴ these parenting programs have demonstrated effectiveness in reducing child behavioral problems. There is thus a need to publicize those effective evidence-based interventions to communities in developing countries where they are much needed.

Wiehe³⁵ suggested that child maltreatment prevention take place at three levels: primary, secondary and tertiary. Primary preventions consist of establishing public policies and services relevant to children's welfare whereby the United Nations Declaration of the Rights of the Children (1997) is implemented. Secondary preventions will be directed towards high-risk parents through early interventions to enhance parenting skills and appropriate practices. Finally, tertiary preventions consist of mobilizing and strengthening the existing community mental health and social services agencies to help in the guidance process and thus limiting the effects of parental psychological maltreatment on children.³⁵

Furthermore, the United Nations Convention of the Rights of the Child (UNCRC) consists of a universal human rights treaty, which sets up the rights of children. The CRC defines a child's needs and rights that should be respected by the national governments that will authorize it. The UNCRC integrates the various human rights (from civil to cultural, economic, political and social rights) in the form of 54 articles and two optional protocols.³⁶ Albuhairan *et al.*³⁷ conducted a study in Saudi Arabia among school professionals to evaluate the impact of CRC ratification. In total, 3777 school professionals participated in the study, which found that most of the participants had a low to intermediate level of awareness about child maltreatment, the CRC ratification, and particularly about Article 19, which states that children have the right to be protected from all forms of violence.³⁶ The data obtained were based on self-administered questionnaires that assess awareness of child maltreatment and of national policies in addition to demographic information. The study also showed that most professionals have not been exposed to any child maltreatment training; however, most are ready to do so. A more recent General Article 13 (GC13) has been

updated, which explains more explicitly how children should be protected; what they have to be protected from; and, the side responsible for providing this protection.

Fayyad *et al.*³⁸ conducted a study in which 20 Lebanese lay workers and 87 mothers of children with behavioral problems participated in a training that provided parents with new parenting skills and strategies to better deal with their children's condition. The Strengths and Difficulties Questionnaire (SDQ) was completed by the mothers to screen for children with behavioral problems at the beginning and end of the study. The study found that 40.2% of mothers used hitting as a means of punishment in cases of child misconduct. This parenting strategy, dropped to 6.2% after the intervention. Additionally, 57.3% of mothers thought that shouting worked to reduce misbehaviors, but the number of mothers who held that view decreased to 9.8% after the intervention. These kinds of interventions are needed in the Arab world and would provide the population with new parenting skills and tools to understand children. These skills would likely contribute to a notable decrease in the rates of childhood adversities.

Conclusion

The present review provides a review of the literature on victims of non-war related childhood adversities in the Arab world. It was necessary to conduct such research in the non-Western world where informants may be reluctant to disclose information about childhood adversities. The present review documents the prevalence, moderators, and outcomes of childhood adversities as reported in various Arab counties. Findings are inconsistent, but clearly report how Arab children are significantly victimized due to all forms of abuse. We suggest however that adversities be studied in co-occurrence in areas of prospective research. Childhood adversities have been previously studied in an individual fashion (i.e. each adversity alone), and since adversities normally occur simultaneously, it would be advantageous to report the relationships between adversities and assess their outcomes synchronously. The results gathered in the current review should be a cause for concern and can provide information for planning better prevention programs, raising awareness among the public and mental health professionals, and initiating policies to disseminate evidence-based prevention and intervention programs.

References

- Ibrahim N, Jalali E, Al Ahmadi J, Al Bar, A. Prevalence, risk factors and outcome of childhood abuse reported by female university students in Jeddah. *Egypt Publ Health Assoc.* 2008;83(5,6):
- Elbedour S, Abu Bader S, Onwuegbuzie A, Abu-Rabia A, El Aassam S. The scope of sexual, physical, and psychological abuse in a Bedouin Arab community of female adolescents: The interplay of racism, urbanization, polygamy, family honor, and the social marginalization of women. *Child Abuse Negl.* 2006; 30:215-229.
- Haj Yahia M, Tamish S. The rates of child sexual and its psychological consequences as revealed by a study among Palestinian university students. *Child Abuse Negl.* 2001;251303-1327.
- Usta J, Farver J. Child sexual abuse in Lebanon during war and peace. *Child Care Health Dev.* (2010); 36(3):361-8. doi: 10.1111/j.1365-2214.2010.01082.x.36, 3,361-368.
- Al-Mahroos F, Al Amer E. Child physical abuse in Bahrain: A 10-year study, 2000-2009. *East Mediterr Health J.* 2011; 18(6):
- Shotar AM, Alzyoud S, Oweis A, Alhawamdeh KA, Khoshnood K. Sexual Offenses among Children in The North Of Jordan: An Exploratory Study. *J Child Sexual Abuse.* 2015;24(5):538-54. doi: 10.1080/10538712.2015.1042181.
- Jumaian AA. Prevalence and long-term impact of child sexual abuse among a sample of male college students in Jordan. *East Mediterr Health J.* 2001;7(3):435-440.
- Itani L, Haddad Y, Fayyad J, Karam A, Karam E. Childhood Adversities and Traumata in Lebanon: A National Study. *Clin Pract Epidemiol.* 2014;10(1):116-125.
- Karam EG, Mneimneh ZN, Karam AN, Fayyad JA, Nasser, SC, Chatterji S, et al. Prevalence and treatment of mental disorders in Lebanon: A national epidemiological survey. *Lancet* 2006;367(9515):1000-6.
- Kudrati M, Plummer M, El Hag Yousif N. Children of the sug: A study of the daily lives of street children in Khartoum, Sudan, with intervention recommendations. *Child Abuse Negl.* 2008; 32: 439-448.
- Abolfotouh MA, El-Bourgy MD, Seif El Din AG, Mehanna AA. Corporal Punishment: Mother's Disciplinary Behavior and Child's Psychological Profile in Alexandria, Egypt. *J Forensic Nurs.* 2009;5(1):5-17. doi: 10.1111/j.1939-3938.2009.01025.x.
- Abolfotouh A, Mostafa et al. Abolfotouh MA, El-Bourgy MD, Seif El Din AG, Mehanna AA. Corporal Punishment: Mother's Disciplinary Behavior and Child's Psychological Profile in Alexandria, Egypt. *J Forensic Nurs.* 2009;5(1):5-17. doi: 10.1111/j.1939-3938.2009.01025.x.
- Lansford J, Alampay L, Al Hassan S, Bacchini D, Bombi A, Bornstein M, et al. Corporal punishment of children in nine countries as a function of child gender and parent gender. 2010;2010:672780. doi: 10.1155/2010/672780
- Youssef R, Attia M, Kamel M. Children experiencing violence 2: prevalence and determinants of corporal punishment in schools. *Child Abuse Negl.* 1998; 22(10):975-985.

15. Haj Yahia M, Kaloti R. The rates and correlates of the exposure of Palestinian adolescents to family violence: toward and integrative holistic approach. *Child Abuse Negl.* 2003;27:781-806.
16. Haj Yahia M, Arieh AB. The incidence of Arab Adolescents' exposure to violence in their families of origin and its sociodemographic correlates. *Child Abuse Negl.* 2000;24(10):1299-1315.
17. Elarousy W, Al-Jadaani M. Emotional abuse among children: A study in Jeddah, Saudi Arabia. *East Mediterr Health J.* 2010;19(10): 869-75. Retrieved from <http://search.proquest.com/docview/1467531170?accountid=8555>
18. McEachern A, Aluede O, Kenny M. Emotional abuse in the classroom: implications and interventions for counselors. *Journal of Counseling and Development* 2008; 86(1): 3-10. Aluede O, Ojugo AI, Okoza J. Emotional abuse of secondary school students by teachers in Edo State, Nigeria. *Research in Education* 2012; 88(1): 29-39
19. Khamis, V. Child psychological maltreatment in Palestinian families. *Child Abuse Negl.* 2000;24(8): 1047-1059
20. Saddik A, Hattab A. Emotional abuse towards children by school teachers in Aden Governate, Yemen: A cross sectional study. *BMC Public Health.* 2012; 12(647). doi: 10.1186/1471-2458-12-64
21. Srivastava RN. *Child Abuse and Neglect: Challenges and opportunities.* New Delhi: Jaypee Brothers Medical Publishers, 2013
22. Al Eissa M, Al Muneef M. Child abuse and neglect in Saudi Arabia: Journey of recognition to implementation of national prevention strategies. *Child Abuse Negl.* 2010; 34(1): 28-33.
23. Gureje O, Oladeji B, Hwang I, Chiu W-T, Kessler RC, Sampson N, Alonso J, et al. Parental Psychopathology and the Risk of Suicidal Behavior in their Offspring: Results from the World Mental Health Surveys. *Mol Psychiatry.* 2011;6(12):1221-1233.
24. Al Favez G, Ohaeri J, Gado O. Prevalence of physical, psychological, and sexual abuse among a nationwide sample of Arab high school students: association with family characteristics, anxiety, depression, self-esteem, and quality of life. *Soc Psychiatry Psychiatr Epidemiol.* 2012; 47(1):53-56.
25. Al-Mahroos F, Abdulla F, Kamal S, Al-Ansari A. Child abuse: Bahrain's experience. *Child Abuse & Neglect* 2005;29(2):187-193. doi:10.1016/j.chiabu.2004.07.008
26. Elbedour S, Onwuegbuzie, AJ, Alatamin M. Behavioral problems and scholastic adjustment among bedouin-arab children from polygamous and monogamous marital family structures: Some developmental considerations. *Genetic, Social, and General Psychology Monographs* 2003; 129(3): 213-37. Retrieved from <http://search.proquest.com/docview/231583531?accountid=8555>.
27. Elbedour S, Onwuegbuzie AJ, Caridine C, Abu-Saad H. The effect of polygamous marital structure on behavioral, emotional, and academic adjustment in children: a comprehensive review of the literature. *Clin Child Fam Psychol Rev.* 2002;5(4):255-71.
28. Al-Krenawi AI, Graham JG, Slonim-Nevo V. Mental health aspects of Arab-Israeli adolescents from polygamous versus monogamous families. *J Soc Psychol.* 2002;142(4):446-460.
29. Al-Krenawi A, Slonim-Nevo V. Psychosocial and familial functioning of children from polygynous and monogamous families. *J Soc Psychol.* 2008;148(6):745-764.
30. Sami H, Auerbach J, Apter A. Polygamy and mental health of adolescents. *Eur Child Adolesc Psychiatry.* 2009;18(12):755-760.
31. Youssef R, Attia M, Kamel M. Violence among schoolchildren in Alexandria. *East Mediterr Health J.* 1999;5(2):282-298.
32. Karam EG, Fayyad J, Karam AN, Tabet CC, Melhem N, Mneimneh Z, et al. Effectiveness and specificity of a classroom-based group intervention in children and adolescents exposed to war in Lebanon. *World Psychiatry* 2009;7(2): 103-109.
33. Al-Mahroos F. Corporal punishment and psychological maltreatment among schoolgirls in Bahrain. *Bahrain Medical Bulletin* 1997;19(3):70-73.
34. Graeff-Martins AS, Flament MF, Fayyad J, Tyano S, Jensen P, Rohde LA. Diffusion of efficacious interventions for children and adolescents with mental health problems. *J Child Psychol Psychiatry.* 2008;49(3):335-52.
35. Wiehe VR. Child maltreatment prevention. *Interpersonal Violence: the practice series.* In Wiehe VR (Ed), *Working with Child Abuse and Neglect: A Primer* (1996), 177-188 SAGE Publications Inc. <http://dx.doi.org/10.4135/9781483327716>.
36. World Health Organization. *Guidelines for Medico-Legal Care for Victims Of Sexual Violence.* WHO Geneva 2003: http://www.who.int/violence_injury_prevention/publications/violence/med_leg_guidelines/en/.
37. Al Buhairan F, Inam S, Al Eissa M, Noor I, Al Muneef M. Self-reported awareness of child maltreatment among school professionals in Saudi Arabia: Impact of CRC ratification. *Child Abuse Negl.* 2011;3(x): 1032-1036.
38. Fayyad J, Farah L, Cassir Y, Salamoun MM, Karam EG. Dissemination of an evidence based intervention to parents of children with behavioral problems in a developing country. *Eur Child Adolesc Psychiatry ECAP.* 2010; 19(8): 629-36.

يعاني أطفال العالم من الشدائد والمحن خلال فترة الطفولة على نطاق واسع، ويتم تسليط الضوء عليها لزيادة الوعي عن أهميتها فيما يتعلق بالصحة النفسية. هذه الشدائد تزيد من احتمال التأثيرات السلبية على الصعيد الأكاديمي والعلاقات الاجتماعية والصحتين النفسية والجسدية على المدى القريب والبعيد. ان هذه المقالة تركز على مراجعة كل الاوراق العلمية عن الشدائد الغير متعلقة بالحروب والتي صدرت من بلدان عربية أو من سكان عرب. ظهر العديد من الدراسات الكمية والنوعية في العالم العربي من بلدان لبنان، الاردن، فلسطين، الكويت، البحرين، مصر، اليمن، السودان، والمملكة العربية السعودية بين السنوات 1989 و2015. تلخص هذه المقالة جميع الدراسات من العالم العربي وتبحث في نتائج هذه الشدائد ووقوعها وانعكاساتها فيما يتعلق بتعزيز وتصميم برامج الوقاية ولتحديد السياسات الاجتماعية والصحية.

Corresponding author

Dr John Fayyad, MD, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut -Lebanon

Email address: jfayyad@idraac.org

Authors

Dr John Fayyad, MD, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut - Lebanon

Email address: jfayyad@idraac.org

Ms. Joanna Diab, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Ms. Nada Yousef, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Ms. Claudia Farhat, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon

Professor Elie G Karam MD, Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Beirut - Lebanon.

Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut - Lebanon

Email address: egkaram@idraac.org

The Relationship between War Trauma and Anxiety and Posttraumatic Stress Disorder among Preschool Children in the Gaza strip

Heba Al Ghalayini, Abdelaziz M Thabet

العلاقة بين رض الحرب واضطراب كرب ما بعد الرض والقلق لدى الاطفال ما قبل سن المدرسة في قطاع غزة
هبة رياض الغلايني، عبد العزيز موسى ثابت

Abstract

Aim: The current study investigated the relationship between war trauma and anxiety and posttraumatic stress disorder (PTSD) among preschool children in the Gaza Strip. **Methods:** N=399 mothers and their preschool children who were enrolled in kindergartens in the Gaza Strip. Child ages ranged from 3-6 years with mean age of 4.48 years. Mothers were interviewed using a sociodemographic questionnaire, Gaza Traumatic Events Checklist, Child PTSD Symptom Scale-parent form, and Spence Children's Anxiety Scale. **Results:** The most commonly reported traumatic experiences by mothers for their children were: hearing shelling of the area by artillery (95.5%), hearing loud noises from drones (89.2%) and seeing mutilated bodies on TV (81.2%). The mean number of traumas experienced by preschool children was 8.3. PTSD prevalence was 6% with scores higher in children aged five and older. The mean for total anxiety was 49.84, generalized anxiety was 10.7, social anxiety was 8.4; specific phobia was 21.1, and separation anxiety was 9.65. There were significant associations between trauma and PTSD and anxiety as well as a significant association between PTSD and anxiety. **Conclusion:** Preschool children exposed to war-related incidents are at risk of developing PTSD and anxiety problems, which highlights the need to establish programs for preschool children affected by traumatic events associated with war.

Key words: Trauma, Posttraumatic Stress Disorder, PTSD, anxiety, preschool children, war, Gaza

Declaration of interest: None

Introduction

Since 1948, Palestinians have suffered from repeated episodes of war and conflict, which have occurred approximately every seven to 10 years. Palestinians live under severe conditions with the expectation that every nine years there will be war or an Intifada (uprising) compounded by a continued sense of oppression caused by the Occupation.¹ In the last seven years, people living in Gaza have been exposed to three recurrent wars: the first was on December 2008, which lasted 23 days; the second started on November 2012 and lasted for 8 days; and the most recent started on July 2014 and went on for 51 days.

On 7 July 2014, a humanitarian emergency was declared in the Gaza Strip, which involved intense Israeli aerial and navy bombardment. Israeli aggression de-escalated following an open-ended ceasefire which came into force on 26 August 2014. The scale of destruction, devastation and displacement during the 51 days of conflict was unprecedented in Gaza since at least the start of the Israeli occupation in 1967. The humanitarian impact of this aggression is understood against a backdrop of heightened vulnerability and instability in Gaza.²

There is no doubt that these offenses have too many devastating effects causing physical, emotional and psychological problems for people living in the Gaza Strip, including children. Traumatic events related to war affected Palestinians' normal daily life and had a negative impact on individual well-being in all ages, especially children. Psychiatric disorders associated with war traumas are best regarded, according to the International Classification of Diseases - 10th Edition (ICD-10), as depressive adjustment disorders with anxiety symptoms (e.g. generalized anxiety, phobic anxiety, etc.) and posttraumatic stress disorder (PTSD) as a reaction to loss of security.^{3,22,30}

Trauma overwhelms the affected person's ego capacities to understand what has happened. Fundamental assumptions about the safety of the world and trust in the relationships are undermined as the individual struggles to assimilate this experience.⁴ Children who experience severe early trauma often develop a foreshortened sense of the future. They come to expect that life will be dangerous; that they may not survive; and, as a result, they give up hope and expectations for themselves that extend into the future.⁵

Exposure to trauma in early childhood may cause disruptive and disorganizing effects on early physical, cognitive, social and emotional development. Traumatized preschoolers often present with regulatory and social difficulties, including frequent tantrums, aggression and noncompliance. Some young children exposed to trauma develop symptoms consistent with a diagnosis of PTSD.⁶ Children may suffer from PTSD as well as other types of psychopathology, which are not specific to the experience of trauma, such as general anxiety and depression.⁷ PTSD symptoms include re-experiencing the traumatic event, avoidance of reminders of the event, and hyperarousal. Responses to violence and trauma may be categorized as either self-directed or directed toward others and can include nightmares and sleep disturbances, regression and clinginess to caregivers, loss of concentration and learning difficulties, fearfulness and anxiety as well as aggressive behavior.⁸

Previous studies have shown strong associations between traumatic experiences and PTSD symptoms among preschool children, but few children have met the full diagnostic criteria for PTSD due to the old diagnostic criteria used when assessing the condition in preschool children. Previous studies reported high levels of

internalizing and externalizing symptoms as well as PTSD symptoms of re-experiencing, avoidance, and hyperarousal in toddlers who experienced traumatic life events^{9,10} though they may not meet the full criteria for this diagnosis.¹¹ Early childhood trauma also contributes to adverse outcomes in adulthood, including depression, PTSD, substance misuse, health problems (likely related to increased stress and wear and tear on the immune system) and decreased occupational attainment.¹² Studies conducted on Palestinian children during the first Intifada showed that they suffered from depression, anxiety, and PTSD symptoms.^{13 14 15}

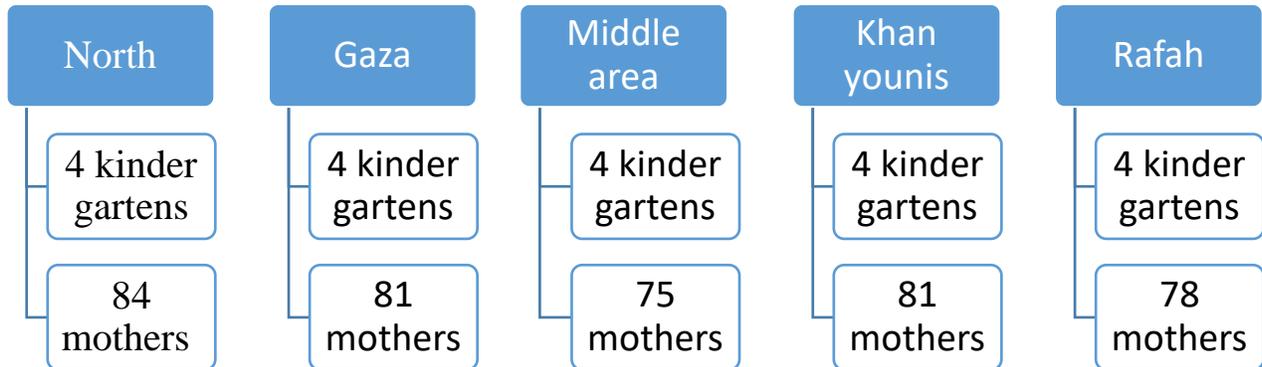
The present study aimed to investigate the relationship between war trauma and anxiety and PTSD among preschool children in the Gaza Strip.

Methods

Participants

The study sample consisted of N=420 mothers of preschool children. From this sample only n=399 mothers were reached and N=399 preschool children were also included (n=165 boys, 41.35% and n=234 girls, 58.65%. Their ages ranged from 3-6 years (M=4.48 years).

Figure 1. Distribution of the study sample according to place of residence



Instruments

Sociodemographic scale

Demographic information about the participants included gender, age, number of siblings, area of residence and monthly family income.

Gaza Traumatic Event Checklist (GTECL)¹⁶

The Gaza Traumatic Checklist was originally developed by the Gaza Community Mental Health Program to assess level of trauma exposure typical for the

Palestinian population in Gaza.¹⁶ This version of the Gaza Traumatic Event Checklist, updated after the most recent war on Gaza on 2014, lists 25 events relevant to the Israeli attacks. Items number 1-4 indicated hearing experiences, items 5-15 indicated witnessing experiences, and items 16-25 indicated direct exposure to trauma. The checklist was completed by mothers with ('yes' or 'no' statements). Mothers were asked about the events their children had experienced in the preceding 12 months. The total composite score (0-25) provides an indication of the amount and type of war exposure the

respondent has experienced during the war. This scale was validated in Palestinian society.^{21,23} The internal consistency of the scale, calculated using Chronbach's alpha, was $\alpha=0.82$.

Child PTSD Symptom Scale-parent form (CPSS)¹⁷

Posttraumatic stress symptomatology in children was assessed using a modified version of the Child PTSD Symptom Scale (CPSS). Using a 4-point scale ranging from 0 = not at all to 3 = five or more times a week, mothers rated the frequency with which the child demonstrated each of the 17 items, corresponding to the DSM-IV PTSD symptoms. This measure has shown good convergent, discriminant validity, and high reliability in assessing PTSD in older age group Palestinian children.³ The internal consistency of the scale, calculated using Chronbach's alpha, was $\alpha=0.91$.

Spence Children's Anxiety Scale (SCAS)¹⁸

A preschool version (The Preschool Anxiety Scale) was adapted from the Spence Children's Anxiety Scale (SCAS) by Spence.¹⁸ The Arabic version of the scale was used in the current study consisted of a list of 28 items that describe anxiety in preschool children. It assesses generalized anxiety (1, 4, 8, 14, 28), social phobia (social anxiety) (2, 5, 11, 15, 19, 23), separation anxiety (6, 12, 16, 22, 25), obsessive-compulsive disorder (3, 9, 18, 21, 27), and physical injury fear (7, 10, 13, 17, 20, 24, 26). For each item, the parent circles the response that best describes her/his child. She/ he should circle the 4 if the item is very often true, 3 if the item is quite often true, 2 if the item is sometimes true, 1 if the item is seldom true or if it is not true at all circle the 0. The parent should answer all the items as well as she/he can, even if some do not seem to apply to her/his child. This scale was validated in Palestinian society and internal consistency, calculated using Chronbach's alpha, was as follows: generalized anxiety (5 items) where the value of alpha ($\alpha= 0.61$), social anxiety (6 items) where the value of alpha ($\alpha= 0.68$), OCD (5 items) where the value of alpha ($\alpha=0.57$), physical injury anxiety (6 items) where the value of alpha = (0.76), separation anxiety (5 items) where the value of alpha ($\alpha= 0.57$) and the value of split half = (0.43).¹⁹ The internal consistency of the total anxiety scale, calculated using Chronbach's alpha, was $\alpha=0.90$.

Study Procedure

The data was collected from 20 kindergartens (four kindergartens from each area of Gaza Strip - the North area, Gaza city, Middle area, Khan Younis and Rafah). We had an official letter of approval from the Palestinian

Ministry of Education-Kindergarten section. The data was collected by the first author and three assistants. The researcher collected data through meeting the principal of each of the 20 kindergartens, which were chosen randomly from the list of kindergartens given by the Ministry of Education. We explained the purpose of the study then asked them to select randomly from the registration book the number of children already prepared in a list for sampling. Mothers of the selected children received a written form to sign explaining the study purpose and stressing that the data will be kept with the researchers for scientific research and their confidentiality, and that of their children, was ensured. The mothers were interviewed by researchers and field workers inside the kindergartens with interview lasting 30 minutes. The response rate was 95%. Data collection was conducted in May 2015.

Statistical analysis

We used the Statistical Package of Social Science - version 20 (SPSS 20.0) for data entry and analysis. Data coding and recording was completed before analysis. Frequency tables that show sample characteristics and plot differences between various variables were done. Descriptive statistics were used to present the characteristics of the sample. Independent *t* test was used to test the gender differences related to children, trauma, PTSD, and anxiety. One-way ANOVA test was used to study the differences among the 'means' of preschoolers' trauma, PTSD and anxiety according to age, family income, and type of residence. Pearson correlation was used to explain and clarify the data and to demonstrate the relationship between preschool children trauma and anxiety, the relationship between preschool children trauma and PTSD, and the relationship between preschool children anxiety and PTSD. Linear regression investigated the association between independent (traumatic events) and psychological problems (PTSD and anxiety) as dependent variables.

Results

Socio-demographic characteristics of the preschool children

As shown in Table 1, the total number of questionnaires returned were 399, 174 (50.4%) were from boys and 171 (49.6%) were from girls, which resulted in a response rate of 95%. Ages ranged from 3-6 years with mean age 4.48 (SD=0.67). Regarding place of residence, 21.02% of children were from North Gaza, 20.30% were from

War Trauma and Anxiety and PTSD among Preschool Children in the Gaza strip

Gaza, 18.8% from Middle area, 20.3% from Khan Younis, and 19.55% from Rafah.

Table 1. Socio-demographic characteristic of the preschool children (N=399)

<i>Gender</i>	<i>Number</i>	
Boys	165	41.35
Girls	234	58.65
<i>Age mean age 4.48 (SD =0.67).</i>		
3-4 years	171	42.9
5-6 years	228	57.1
<i>Number of siblings</i>		
4 and less	262	65.66
5-7 siblings	89	22.31
8 and more	48	12.03
<i>Place of residence</i>		
North Gaza	84	21.05
Gaza	81	20.30
Middle area	75	18.80
Khan Younis	81	20.30
Rafah	78	19.55
<i>Family monthly income</i>		
Less than 1200 NIS (one \$ =3.80 NIS)	252	63.16
1201 - 2500 NIS	76	19.05
2501 - 3000 NIS	33	8.27
3001 NIS and more	38	9.52

Types of traumatic events after 51 days of war

The most common traumatic experiences reported by mothers on behalf of their children were: hearing shelling of the area by artillery (95.5%), hearing the loud noise of drones (89.2%), seeing mutilated bodies on TV (81.2%), being forced to leave home with family members due to shelling (64.4%) and inhalation of bad

smells due to bombardment (62.2%). The least common traumatic experiences were: threats of being killed (6.5%), witnessing close relatives receive threats of being killed (7.8%) and threatened with death by being used as human shield moving from home to home by the army (8%).

Table 2. Type of traumatic event

<i>Type of traumatic event</i>	Yes		No	
	No.	%	No.	%
<i>Hearing shelling of the area by artillery</i>	381	95.5	18	4.5
<i>Hearing the loud noise of drones</i>	356	89.2	43	10.8
<i>Seeing mutilated bodies and dead people on TV</i>	324	81.2	75	18.8
<i>Being forced to leave your home with family members due to shelling</i>	257	64.4	142	35.6
<i>Inhalation of bad smells due to bombardment</i>	248	62.2	151	37.8
<i>Hearing about the killing of a known person</i>	235	58.9	164	41.1
<i>Witnessing firing by tanks or heavy artillery at neighbors' homes</i>	182	45.6	217	54.4

<i>Witnessing demolition of big buildings</i>	168	42.1	231	57.9
<i>Hearing about the killing of a close relative</i>	149	37.3	250	62.7
<i>Deprivation from water or electricity during detention at home</i>	141	35.3	258	64.7
<i>Witnessing firing by tanks and heavy artillery at own home</i>	100	25.1	299	74.9
<i>Witnessing assassination of people by rockets</i>	100	25.1	298	74.9
<i>Threatened by shooting</i>	92	23.1	307	76.9
<i>Witnessing shooting of a known person</i>	85	21.3	314	78.7
<i>Witnessing shooting of a close relative</i>	74	18.5	325	81.5
<i>Witnessing killing of a close relative</i>	73	18.3	326	81.7
<i>Destruction of your personal belongings during incursion</i>	63	15.8	336	84.2
<i>Witnessing killing of a known person</i>	56	14	343	86
<i>Witnessing arrest of a known person</i>	51	12.8	348	87.2
<i>Exposure to physical injury as a result of the bombing of your home</i>	44	11	355	89
<i>Exposure to physical injury caused by shrapnel, bullet or missile</i>	40	10	359	90
<i>Witnessing arrest of a close relative by the army</i>	38	9.5	361	90.5
<i>Threatened with death by being used as human shield by the army to move from one home to home</i>	32	8	367	92
<i>Threat of having a close relative being threatened with killing</i>	31	7.8	368	92.2
<i>Threat of being killed</i>	26	6.5	373	93.5

The study showed that Palestinian preschool children in the Gaza Strip had experienced from 0-25 traumatic events with the mean being 8.3 traumatic events (SD=4.30). Independent *t*-test was conducted. The results showed that the mean number of traumatic events in boys was 7.99 (SD=4.07) and 8.67 for girls (SD=4.45). There were no statistically significant differences in total traumatic events according to gender ($t=1.55, p=0.21$).

For other sociodemographic variables the results showed that there were statistically significant differences in traumatic events in favor of children living in the Middle area ($F=8.8, p=0.001$). In addition, children having more than eight siblings had more traumatic events than the other two groups ($F=17.29, p=0.001$) and children

having a family monthly income of less than 1200 NIS experienced more traumatic events than the other three groups (above 1201 NIS) ($F=17.29, p=0.001$).

Prevalence of PTSD

According to DSM-IV-diagnostic criteria for PTSD, a person must have reported one re-experiencing symptom, three avoidance symptoms, and two arousal symptoms. Results showed that $n=160$ children (40.1%) reported no PTSD symptoms, $n=116$ children (29.1%) reported at least one criterion of PTSD (B or C or D) with $n=99$ indicating partial PTSD (24.8%), and $n=24$ reporting full criteria of PTSD (6%) as Table 3 shows.

Table 3. Prevalence of PTSD

PTSD symptoms	No.	%
<i>No PTSD</i>	160	40.1
<i>One symptom</i>	116	29.1
<i>Partial PTSD</i>	99	24.8
<i>Full PTSD</i>	24	6.0

PTSD and sociodemographic variables

Only one significant difference was found in the PTSD subscale according to age of preschool children on the arousal subscale for the 5-6 years old group of children. The results showed that children aged 5-6 have reported having more PTSD symptoms than 3-4 years old children ($M=7.77$, $SD=4.35$) ($t=2.62$, $p=0.009$).

One-way ANOVA analysis was conducted to find the differences between PTSD and number of siblings. Significant differences in total PTSD and subscales according to number of siblings were found. Total PTSD symptoms for re-experiencing, avoidance and arousal were higher in children with eight or more siblings. ($M=24.85$, $SD=11.41$).

Frequency of preschool anxiety symptoms

The most common anxiety symptoms reported by parents were: he/she has to keep thinking special thoughts (e.g., numbers or words) to stop bad things from happening (66%), has nightmares about being apart from me (65.4%), is afraid of the dark (62.2%), is afraid of talking in front of the pre-school class group (e.g., show and tell) (57.9%), worries that something bad might happen to him/her (e.g., getting lost or kidnapped), and that he/she won't be able to see you again (56.3%).

Prevalence of preschool anxiety

Preschool anxiety scales showed that the mean for total anxiety scale was 49.84, generalized anxiety was 10.7, social anxiety was 8.4, specific phobia was 21.11 and separation anxiety was 9.65.

Anxiety and sociodemographic variables *t*-test was conducted to find the differences in anxiety according to gender. Results showed that there were no significant differences in means of anxiety and all subscales according to gender. The ages of children were categorized as 3-4 years and 5-6 years. An independent *t*-test was conducted with results showing no significant differences in mean anxiety according to age group ($t=0.94$, $p=0.34$). The results showed that there were statistically significant differences in total anxiety in favor of children living in the Rafah area ($F=4.9$, $p=0.001$), social phobia ($F=2.65$, $p=0.03$), generalized anxiety ($F=3.9$, $p=0.004$), separation anxiety ($F=5.1$, $p=0.001$), and specific phobia ($F=2.5$, $p=0.03$). Moreover, results showed that children having family monthly income of less than 1200 NIS were more anxious than the other three groups ($F=10.16$, $p=0.001$).

Relationship between trauma, PTSD and anxiety

Pearson correlation test was conducted to find the association between trauma, PTSD and anxiety. Results showed that there was significant association between total traumatic events reported by children and total anxiety ($r=0.30$, $p=0.001$), generalized anxiety ($r=0.31$, $p=0.001$), separation anxiety ($r=0.25$, $p=0.001$), and specific phobia ($r=0.14$, $p=0.01$). This suggests experiences that are more traumatic lead to anxiety. In addition, trauma was associated with total PTSD ($r=0.32$, $p=0.001$), re-experiencing ($r=0.32$, $p=0.001$), avoidance ($r=0.28$, $p=0.001$) and arousal ($r=0.23$, $p=0.001$).

Table 5. Pearson correlation coefficient test between trauma, PTSD and anxiety

	1	2	3	4	5	6	7	8	9
1. Trauma									
2. Total anxiety	.30**								
3. Social anxiety	.29**	.76**							
4. Generalized anxiety	.31**	.82**	.62**						
5. Separation anxiety	.25**	.77**	.42**	.60**					
6. Specific phobia	.14**	.82**	.42**	.47**	.52**				
7. Total PTSD	.32**	.64**	.46**	.60**	.48**	.48**			
8. Re-experiencing	.32**	.59**	.39**	.58**	.47**	.44**	.90**		
9. Avoidance	.28**	.55**	.47**	.51**	.39**	.38**	.88**	.67**	
10. Arousal	.23**	.58**	.38**	.54**	.43**	.49**	.90**	.76**	.68**

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Prediction of PTSD by traumatic events

In a univariate linear regression analysis, each traumatic event associated with war was entered as an independent variable in a multiple regression model, with total PTSD

scores as the dependent variable. Two events were significantly associated with total PTSD: hearing about the killing of a known person ($\beta=0.18$, $p=0.001$) and hearing shelling of the area by artillery ($\beta=0.12$, $p=0.01$).

Other significant incidents were deprivation from water or electricity during detention at home ($\beta=0.11$, $p=0.02$), witnessing shooting of a close relative ($\beta=0.12$, $p=0.02$)

and destroying of your personal belongings during incursion ($\beta=0.10$, $p=0.04$) ($F=10.92$ $p<0.001$, $R^2=0.13$).

Table 6. Linear regression analysis for prediction of children PTSD by traumatic events

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	21.71	2.88		7.53	0.001	16.04	27.38
Hearing about killing of a known person	4.57	1.24	0.18	3.68	0.001	2.13	7.01
Hearing shelling of the area by artillery	-7.56	2.88	0.12	2.63	0.01	13.22	1.90
Deprivation from water or electricity during detention at home	3.04	1.30	0.11	2.34	0.02	0.48	5.59
Witnessing shooting of a close relative	3.87	1.68	0.12	2.30	0.02	0.56	7.17
Destruction of your personal belongings during incursion	3.54	1.72	0.10	2.06	0.04	0.15	6.92

Prediction of anxiety by traumatic events

In a univariate linear regression analysis, each traumatic event associated with war was entered as an independent variable in a multiple regression model, with total anxiety scores as the dependent variable: two events were significantly associated with total anxiety: being

threatened by shooting ($\beta=13$, $p=0.001$) and hearing about the killing of a friend ($\beta=0.15$, $p=0.01$). Other significant experiences were witnessing shooting of a close relative ($\beta=12$, $p=0.01$) and deprivation from water or electricity during detention at home ($\beta=12$, $p=0.02$) ($F=11.19$, $p<0.001$, $R^2=0.09$).

Table 7. Linear regression analysis for prediction of anxiety by traumatic events

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	41.70	1.70		24.55	0.001	38.36	45.04
Threatened by shooting	6.32	2.56	0.13	2.47	0.01	1.29	11.36
Hearing about killing of a friend	6.21	2.05	0.15	3.02	0.001	2.17	10.24
Witnessing shooting of a close relative	6.66	2.64	0.12	2.53	0.01	1.48	11.85
Deprivation from water or electricity during detention at home	5.28	2.21	0.12	2.39	0.02	0.93	9.62

Discussion

The current study investigates the relationship between war trauma experiences in 2014, anxiety and PTSD on preschool children in the Gaza Strip. Children commonly reported shelling of the area by artillery, hearing the loud noise of drones, seeing mutilated bodies on TV, being forced to leave home with family members due to shelling and inhaling bad smells due to bombardment. Less common experiences were the threat of being killed, threat of having a close relative killed in front of them, and the threatened to be used as a human shield by the Israeli army while being moved from home to home. Such findings were consistent with the results of other studies conducted with children in Gaza who were exposed to war-related trauma. The studies showed that the most commonly reported traumatic events were witnessing mutilated bodies and wounded people on television and witnessing the bombardment of other's houses by airplanes and helicopters.^{19,20,21,22} The results showed that 26.8% reported mild, 45.6% reported moderate, and 26.6% reported severe traumatic events. Such results were consistent with a previous study of preschool children in the Gaza Strip.²¹ The study showed no significant statistical differences in reported traumatic events according to gender. Such findings were inconsistent with previous studies of older children, which suggested that boys were more traumatized than girls.²² Results demonstrated that there were statistically significant differences in reporting traumatic events in children living in the Middle area of the Gaza Strip. Such findings could be due to the sample of kindergartens chosen from the Middle, which was one of border areas. Poor children from families with a monthly income of 1200 NIS (\$300) reported more traumatic events than wealthier families. Such findings could suggest that families living near the border areas are farmers whose lands were destroyed in the previous two wars on Gaza, which left such families impoverished and more vulnerable to risk of repeated exposure to trauma, including ground incursion.

Using DSM-IV diagnosis of PTSD, participants would have to report one symptom of re-experiencing, three of avoidance and two of arousal. Results found that 6% of children met the full criteria for a PTSD diagnosis. Findings in the present study were consistent with results of previous studies. In a study of children who were burned, it was found that 10% had PTSD at six months post-injury.²³ The current findings were also consistent with previous studies, which found no differences between boys and girls in relation to the severity of traumatic events if they were mainly with parents during the war and not exposed to trauma in the way older children were exposed.²⁴ Results showed significant

differences in PTSD and its symptom clusters according to age. The group of five year old children reported greater PTSD symptom levels than the other ages. Studies showed that children under age six rarely possess the social, verbal or cognitive ability to relay symptomology associated with previous PTSD diagnostic criteria. These results were consistent with other study results, which showed that very young children cannot conceptualize traumatic events because their cognitive abilities to appraise the meaning of the traumatic events are not as developed as those of older children. Instead, they may present with non-specific behavioral or emotional disorders rather than PTSD reactions. Older children are possibly more vulnerable to developing the full presentation of PTSD after exposure to a severe traumatic event.^{25,26,27,28}

The mean for total anxiety scale was 49.84. It was higher than results from previous studies conducted in the Gaza Strip, which showed that the mean anxiety score for preschool children was 27.46. Such findings could be due to new traumatic events from the 2014 war and/or because families were not able to protect their children since there were even fewer safe places in the Gaza Strip due to repeated air strikes and shelling. No significant differences were found between the means for anxiety problems for boys and girls in terms of total anxiety and all subscales, and no significant differences were found between the means of preschoolers' anxiety problems according to age. Other studies reported no gender differences in anxiety symptoms, except for physical injury fear, which was higher in girls than in boys. Anxiety problems were greater in children with low family income.²⁹ Also, such findings were consistent with other studies which showed no significant gender differences in prevalence of anxiety disorders in preschool children.^{19,30} Our study showed that preschool children with eight siblings or more experienced more anxiety symptoms. Previous results also found that trauma severity and PTSD were positively associated with having large numbers of siblings. Such findings were consistent with a study of preschool anxiety disorders in pediatric primary care, which found that preschoolers who lived with many siblings were more likely to meet the criteria for generalized anxiety disorder, social phobia, and any anxiety disorder.³¹

Our results showed that there was significant correlation between total traumatic events reported by children and total anxiety, generalized anxiety, separation anxiety, and specific phobia and with total PTSD, re-experiencing, avoidance, and arousal, which was also consistent with most of the studies conducted on children in Gaza and other areas.^{19,32} In addition, our results were consistent with a study of New York City preschool children eight

to 10 months after September 11, 2001 in which trauma exposure was significantly correlated with PTSD symptoms.³³

Study limitations

One of the study limitations was reliance on mothers' reports, which were not sufficient for accurately assessing the psychological disorders of their preschool age children. Preschool children may be subject to the effect of parental recall and parental mental health when their difficulties are being reporting. Information from other informants (predominantly teachers) together with observational assessments could have corroborated information obtained from parents. One other study limitation was the absence of a suitable control group of unaffected (resilient) children. Factors contributing to resilience could have been inferred from a controlled study since other tools used in the present study have never been standardized on Palestinians.

Clinical implication

The current study contributes to the existing literature by demonstrating that exposure to war-related trauma contributed to the presence of PTSD and anxiety-related problems among preschool children. Such findings highlight the need for additional and also newer methods of intervention for preschool children living in areas of war and conflict. Such methods of intervention should target all preschool children to reduce the effects of war trauma on them. In addition, organized activities in kindergartens could include activities to maintain psychosocial connections between children and their mothers or caregivers. It is important to promote active participation between mothers and their children. Societal institutions should organize activities for parents and caregivers of preschool children to improve their mental health and help children overcome war trauma, such as through various training courses and educational programs.

In addition, future research should involve the psychiatric assessment of primary care givers in parallel with assessment of their children in order to understand the impact of family and social support in the development of PTSD and anxiety problems in preschool children living in the Gaza Strip.

References

1. Altawil M, Harrold D, Samara M. Children of war in Palestine. Research Centre for evacuee and war child studies 2008;1,58-58.

2. Office for the Coordination of Humanitarian Affairs occupied Palestinian territory OCHA, Jerusalem - Palestine. 2011.
3. Thabet AA, Abed Y, Vostanis P. Comorbidity of PTSD and depression among refugee children during war conflict. *J Child Psychol Psychiatry*. 2004;45(3):533-542.
4. Herman JL. Trauma and recovery: The aftermath of violence from domestic abuse to political terror. New York: Guilford. 1992; 180-202.
5. Terr L. Too scared to cry: Psychic trauma in childhood. Basic Books; 2008; 32-40.
6. American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders, (4th ed.). Washington, DC: Author.
7. Barenbaum J, Ruchkin V, Schwab-Stone M. The psychological aspects of children exposed to war: Practice and policy initiatives. *J Child Psychol Psychiatry*. 2004;45:41-62.
8. Sagi-Schwartz A. The well-being of children living in chronic war zones: The Palestinian-Israeli case. *Int J Behav Dev*. 2008;32,322-336.
9. Mongillo M, Briggs-Gowan M, Ford J, Carter A. (2009). Impact of traumatic life events in a community sample of toddlers. *J Abnorm Psychol*. 2009;37:455-468.
10. Ford T, Goodman R, Meltzer H. The British child and adolescent mental health survey 1999: the prevalence of DSM-IV disorders. *J Am Acad Child Adolesc Psychiatry*. 2003;42(10):1203-1211.
11. Scheeringa MS, Zeanah C, Myers L, Putnam F. New findings on alternative criteria for PTSD in preschool children. *J Am Acad Child Adolesc Psychiatry*. 2003;40: 561-570.
12. Harris WW, Putnam FW, Fairbank JA. Mobilizing trauma resources for children. Shaping the future of children's health, AF Lieberman & R. DeMartino, eds., Johnson & Johnson Pediatric Institute, Calverton, NY. 2006:311-39.
13. Thabet AA, Vostanis P. Posttraumatic stress disorder reactions in children of war: A longitudinal study. *Child Abuse Negl*. 2000;24(2):291-298.
14. Khamis V. Posttraumatic stress disorder among the injured of the Intifada. *J Trauma Stress*. 1993;6:555-559.
15. Garbarino J, Kostelny K. The effects of political violence on Palestinian children's behavior problems. *Child Dev*. 1996;67:33-45.
16. Thabet AA, Abu Tawahina A, El Sarraj Eyad, Vostanis P. Exposure to war trauma and PTSD among parents and children in the Gaza Strip. *Euro Child Adolesc Psychiatry*. 2008;17:191-196.
17. Foa EB, Johnson KM, Feeny NC, Treadwell KR. The Child PTSD Symptom Scale: A preliminary examination of its psychometric properties. *J Clin Child Psychol*. 2001;30(3):376-84.
18. Spence SH, Rapee R. Preschool anxiety scale (parent report). Brisbane, Australia: University of Queensland. 1999.
19. Thabet AA, Abu-Khusah Ashraf, Vostanis P. Prevalence of depression and anxiety in preschool children and Palestinian mothers' mental health. *Arab J Psychiatry*. 2014;25(1):61-70.

20. Thabet AA, Abed Y, Vostanis P. Emotional problems in Palestinian children living in a war zone: a cross-sectional study. *Lancet*. 2002;359(9320):1801-1804.
21. Thabet AA, Abdulla T, Elhelou M, Vostanis P. Effect of trauma on Palestinian children's mental health in the Gaza Strip and West Bank. *Protection of children during armed political conflict: A multidisciplinary perspective*. 2006;123-142.
22. Thabet AA, Karim K, Vostanis P. Trauma exposure in pre-school children in a war zone. *Br J Psychiatry* 2006;188(2):154-8.
23. De Young AC, Kenardy JA, Cobham, VE, & Kimble R. Prevalence, comorbidity and course of trauma reactions in young burn-injured children. *J Child Psychol. Psychiatry* 2012;53(1):56-63.
24. De Young AC, Kenardy JA, Cobham VE. Diagnosis of posttraumatic stress disorder in preschool children. *J Clin Child Adolesc Psychol*. 2011;40(3): 375-384.
25. Dyregrov A, Yule W. A review of PTSD in children. *Child Adolesc Ment Health*. 2006;11(4):76-184. doi:10.1111/camh.2006.11.issue-4
26. Pynoos R. PTSD in children and adolescent. In: Garfinkle B, Carlson G, Weller B (Eds). *Psychiatric Disorders in Children and Adolescents*. 1990; 48-63.
27. El Bedour S, Benseel R, Maruyama GM. Children at risk: psychological coping with war and conflict. *Int J Ment Health*. 1993;22:33-52.
28. Green BL, Grace M, Vary MG, Kramer T, Gleser GC, Leonard A. Children of disaster in the second decade: A 17 year follow-up of Buffalo Creek survivors. *J Am Acad Child Adolesc Psychiatry*. 1994;33:71-79.
29. Canino G, Shrout, PE, Rubio-Stipec M, Bird HR, Bravo M. The DSM-IV rates of child and adolescent disorders in Puerto Rico. *Arch Gen Psychiatry*. 2004;61:85-93.
30. Ford T, Goodman R, Meltzer H. The British child and adolescent mental health survey 1999: the prevalence of DSM-IV disorders. *J Am Acad Child Adolesc Psychiatry*. 2003;42(10):1203-1211.
31. Franz L, Angold A, Copeland W, Costello EJ, Towe-Goodman N, Egger H. *Preschool Anxiety Disorders in Pediatric Primary Care: Prevalence and Comorbidity*, *Child Adolesc Psychiatry*. 2013;52(12):1294-1303.
32. Edwards SL, Rapee RM, Kennedy S. A prospective examination of risk for anxiety symptoms in preschool-aged children. *J Child Psychol Psychiatry*. 2010;51:313-21.
33. Saigh PA, Yasik AE, Mitchell P, Abright AR. (2012). *The Psychological Adjustment of a Sample of New York City Preschool Children 8-10 Months after September 11, 2001*. *Psychol Trauma*. 2011;3(2):109-116. 10.1037/a0020701.

الخلاصة

الهدف: هدفت هذه الدراسة إلى فحص العلاقة بين الرضوض الناتجة عن الحرب واضطراب كرب ما بعد الرض واضطرابات القلق لدى اطفال مرحلة ما قبل المدرسة بعد الحرب الأخيرة على غزة سنة 2014. **الطريقة:** تكونت العينة من 399 أم لأطفال ما قبل المدرسة المسجلين في 20 روضة أطفال في مناطق قطاع غزة. والذين تراوحت أعمارهم بين 3-6 سنوات. واستخدمت في هذه الدراسة عدة مقاييس خاصة بالأأم وهي مقياس المعلومات الديموغرافية، ومقياس الرضوض الناتجة عن الحرب على غزة. ومقياس اضطراب كرب ما بعد الرض، ومقياس القلق لدى الأطفال ما قبل المدرسة. النتائج: لقد وجدت الدراسة على حسب رأي الأم أن 95.5% قد سمعوا القصف على المناطق المختلفة، و89.2% تعرضوا لسماع صوت موتور الطائرات بلا طيار، 81.2% شاهدوا صور الجرحى والشهداء الفلسطينيين على شاشات التلفاز. وكان متوسط الخبرات الصادمة لكل طفل هو حوالي 8 خبرات رضوية. أشارت الدراسة إلى أن نسبة انتشار اضطراب كرب ما بعد الرض بعد أكثر من ستة أشهر على انتهاء الحرب كانت 6%. وكان متوسط القلق لدى الأطفال حوالي 50، ومتوسط القلق العام لجزء من القلق هو 10.7، والقلق الاجتماعي 8.4، والمخاوف الخاصة 21.11، وخوف الانفصال عن الأم 9.65. كما وجدت الدراسة أن أعراض اضطراب كرب ما بعد الرض كانت أكثر انتشاراً لدى الأطفال الذين كانت أعمارهم 5 سنوات. وأظهرت الدراسة أن هناك علاقة قوية بين التعرض للخبرات الرضوية واضطراب كرب ما بعد الرض والقلق لدى اطفال ما قبل المدرسة. **التوصيات:** الدراسات المستقبلية لا بد أن تتضمن التقييم النفسي لمقدم الرعاية للطفل (الأب أو الأُم) بالإضافة إلى التقييم الخاص بالطفل نفسه من أجل فهم أثر الدعم من الأسرة و الدعم الاجتماعي على تطور اضطراب كرب ما بعد الرض واضطرابات القلق لدى اطفال ما قبل المدرسة في قطاع غزة، بالإضافة إلى عمل دراسات أكثر عمقاً تقيس أثر عدد الأحداث الصادمة التي تم التعرض لها الطفل بالإضافة إلى قياس أثر شدة الحدث لأنواع مختلفة من رضات الحرب عوضاً عن القيام بعد الخبرات الصادمة التي تعرض لها الأطفال فقط من أجل تحديد شدة الأحداث الصادمة.

Corresponding author

Professor Abdelaziz Mousa Thabet

Emeritus Professor of Child and Adolescent Psychiatry, Al Quds University, School of Public Health, Child Institute - Gaza
PO Box 5314 Palestine

Email: abdelazizt@hotmail.com

Authors

Professor Abdelaziz Mousa Thabet

Emeritus Professor of Child and Adolescent Psychiatry, Al Quds University, School of Public Health, Child Institute - Gaza
PO Box 5314 Palestine

Ms Heba Riyad Al-Ghalayini, Psychosocial Support Specialist at War Child Holland Foundation - Gaza

Email: hebaghalayini@hotmail.com

Duration of Treatment as a Risk Factor for Metabolic Syndrome in Patients with Schizophrenia Receiving Antipsychotic Medication

Basma Ahmed, Magda Fahmy, Khaled Abd El Moez, Haydy Hassan

مدة العلاج كعامل خطورة لمتلازمة الايض في مرضى الفصام الذين يتلقون مضادات الفصام

بسمة احمد، ماجدة فهمي، خالد عبد المعز، هايدي حسن

Abstract

B **ackground:** Metabolic syndrome is a leading cause of morbidity and mortality in patients with schizophrenia. The prevalence rate is double that of a non-psychiatric population. **Objective:** The present study aimed to determine the duration of treatment as a risk factor for metabolic syndrome in patients with schizophrenia receiving antipsychotic medication. **Methods:** Structured psychiatric interview was conducted using ICD-10 criteria, laboratory investigation (TG (triglycerides), HDL (high-density lipid), blood pressure, fasting blood glucose and metabolic syndrome based on the national cholesterol education program adult treatment panel three criteria. **Results:** The present study showed that 52.9% did not fulfill the criteria for metabolic syndrome with 47.1% meeting the criteria. The incidence of metabolic syndrome in those who received second-generation antipsychotics was 68.6% while metabolic syndrome in those who received first generation antipsychotics was 25.7%. **Conclusion:** There was a statistically significant difference between the incidence of metabolic syndrome and duration of treatment in the two groups being studied.

Keywords: Metabolic, schizophrenia, antipsychotic

Declaration of interest: None

Introduction

Schizophrenia is a mental disorder often characterized by abnormal social behavior and failure to recognize what is real.¹ The first-line psychiatric treatment for schizophrenia is antipsychotic medication.² Most people on antipsychotics have side effects.³ The use of antipsychotics increases the risk not only of diabetes, but also of metabolic syndrome. While a standard definition of metabolic syndrome does not exist, metabolic syndrome is generally thought to include weight gain and hypertriglyceridemia along with increased insulin, glucose, and low-density lipoprotein cholesterol levels.⁴ It is unknown why some patients will develop metabolic syndrome while others will not. Insulin resistance and obesity are considered integral elements in the development of the syndrome,⁵ but accumulating evidence suggests that varying degrees of insulin resistance may be the common etiological factor for the individual components of metabolic syndrome.⁶

While metabolic syndrome itself is a serious health risk and medical complication, research suggests that it may place patients at an increased risk for other serious medical diseases, such as heart disease.⁷ Atypical antipsychotics have been frequently cited as causing a

higher increase in weight gain than conventional antipsychotics.⁸ Atypical antipsychotics can increase the risk of hyperglycemia and impaired glucose levels and subsequently increase the risk of metabolic syndrome.⁹

Aim

The present study was designed to determine the duration of treatment as a risk factor for metabolic syndrome in patients with schizophrenia receiving antipsychotic medication

Subjects and method

A cross-sectional study was conducted in the psychiatry outpatient clinic at Suez Canal University Hospital and Ismailia Psychiatry Outpatient Clinic. The sample consisted of seventy (N=70) patients diagnosed with schizophrenia, according to the International Classification of Diseases - 10th Edition (ICD-10), all who were free from major medical disorder requiring prolonged treatment and had received antipsychotic medication for four months. Patients were aged 18 to 60 years old.

The present study excluded patients with a prior history of substance abuse, history of diabetes before

medication, with no mental retardation or prior history of receiving other medications known to produce metabolic derangement.

The group was further divided into two groups: Group A: n=35 patients who were receiving first generation antipsychotics for a period of at least four months (Haloperidol 10-30mg). Group B: n=35 patients who were receiving second generation antipsychotics for a period of at least four months (Risperidone 3-6mg, Olanzapine 10-20mg, or Quetiapine 200-800mg).

Data collection

Demographic information included personal (age, gender, BMI, waist circumferences), medical and psychiatric history. A structured psychiatric interview followed the ICD-10 criteria and used appropriate laboratory investigations (TG, HDL, Systolic blood pressure, diastolic blood pressure, fasting blood glucose). The prevalence of the metabolic syndrome was assessed based on the National Cholesterol Education Program adult treatment panel III criteria.¹¹

To diagnose metabolic syndrome, we referred to the National Cholesterol Education Program Adult Treatment Panel-III (NCEP-ATP III) guidelines, where the diagnosis of MS established whether the patient met three of the following five diagnostic criteria:

- Serum triglycerides ≥ 150 mg/dl or treatment with triglyceride-lowering drugs.
- HDL-cholesterol < 40 mg/dl in males or < 50 mg/dl in females.
- Systolic/diastolic blood pressure $\geq 130/85$ mmHg or subjected to antihypertensive treatment.
- Fasting blood glucose ≥ 110 mg/dl, subjected to glucose lowering treatment with oral

antidiabetics, or previously diagnosed diabetes mellitus.

- Waist circumference ≥ 102 cm in men or ≥ 88 cm in women.

Data management and statistical analysis

Data were fed to the computer using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. Comparison between different groups regarding categorical variables was tested using Chi-square test. Quantitative data were described using mean and standard deviation, minimum and maximum. For normally distributed data, comparison between two independent populations was via independent *t*-test. Correlations between two quantitative variables were assessed using Pearson coefficient. Significance test results are quoted as two-tailed probabilities. Significance of the obtained results was judged at the 5% level.

Results

Seventy (N=70) patients met the criteria for diagnosis of schizophrenia, according to the ICD10. They were divided into two groups according to the type of antipsychotic treatment received. Patients in group A (n=35, or 50%) those who received first-generation antipsychotics. Patients in group B (n=35, or 50%) received second-generation antipsychotics.

Demographics

Table 1. Comparison between Groups A and B regarding age, gender, residence, education, work and marital status

Variables	Group A (n=35)		Group B (n=35)		Test of sig.
	N	%	N	%	
Age	23-51 36.8±8.37		22-50 39.3±8.7		T=1.1 P=0.29
Gender	23 12	65.6 34.4	22 13	62.9 37.1	X ² =0.09 P= 0.76
Residence	26 7 2	74.3 20 5.7	20 9 6	57.2 25.7 17.1	X ² = 3.03 P=0.219
Education	7 11 6 6 5	20 31.4 17.1 17.1 14.3	8 10 4 7 6	22.9 28.6 11.4 20 17.1	X ² = 2.12 P=0.282

University					
Occupation					X ² = 1.98 P=0.621
Working	8	22.8	11	31.5	
Not working	27	77.2	24	68.5	
Marital status					X ² = 2.01 P=0.36
Single	24	68.6	22	62.9	
Married	6	17.1	7	20	
Divorced	4	11.4	6	17.1	
Widow	1	2.9	0	0	

No statistical significant difference between the two groups regarding the age, gender, residence, education occupation and marital status.

Table 2. Comparison between patients regarding duration of illnesses

Duration of illnesses (years)	Group A (n=35)		Group B (n=35)		Total (N=70)		Critical Ratio	Test of sig.
	N	%	N	%	N	%		
> 3	8	22.9	7	20	15	21.4	0.65	No
3 - > 5	7	20	9	25.7	16	22.9	1.71	No
5 - > 7	12	34.2	10	28.6	22	31.4	0.98	No
< 7	8	22.9	9	25.7	17	24.3	0.81	No
Total	35	100	35	100	70	100		

There was no statistical significant difference regarding duration of illness.

Table 3. Distribution of patients regarding duration of treatment

Duration of treatment (years)	Group A (n=35)		Group B (n=35)		Total (N=70)		Test of sig.
	N	%	N	%	N	%	
>2	9	25.7	10	28.6	19	27.1	X ² = 1.23 P =0.75
2 - >4	9	25.7	10	28.6	19	27.1	
4 - >6	13	37.2	9	25.7	22	31.4	
<6	4	11.4	6	17.1	10	14.3	
Total	35	100	35	100	70	100	

There was no statistical significant difference regarding duration of treatment.

Metabolic Syndrome

Table 4. Frequency of metabolic syndrome among patients

Metabolic syndrome	Group A (n=35)		Group B (n=35)		Total (N= 70)		Test of sig.
	N	%	N	%	%	N	
No	26	74.3	11	31.4	37	52.9	X ² = 12.89 P = 0.0001*
Yes	9	25.7	24	68.6	33	47.1	
Total	35	100.0	35	100.0	70	100.0	

*Highly significant

There was a statistical significant difference regarding metabolic syndrome between group A and group B.

Table 5. Relation between metabolic syndrome and duration of treatment in the two groups

Duration of treatment (years)	Group A (n=35)		Group B (n=35)		P2
	Without metabolic syndrome (n=26)	With metabolic syndrome (n=9)	Without metabolic syndrome (n=11)	With metabolic syndrome (n=24)	
Range	1.00-6.00	2.00-8.00	1.00-8.00	4.00-8.00	0.256
Mean ± S.D.	3.85±1.61	5.54±2.04	4.15±1.82	5.33±1.80	
T	2.01		1.89		0.036*
P	0.013*		0.036*		

P2 comparison between with metabolic syndrome in-group A and B

There was a statistically significant difference between incidence of metabolic syndrome and duration of treatment in the two groups ($p < 0.05$).

On comparing the two groups with metabolic syndrome, no significant difference between the two groups was found.

Table 6. Correlation between duration of treatment and different measurement variables

		Duration of treatment
BMI	Pearson Correlation	0.376**
	Sig. (2-tailed)	0.001
Waist circumference	Pearson Correlation	0.274*
	Sig. (2-tailed)	0.022
TG	Pearson Correlation	0.359**
	Sig. (2-tailed)	0.002
HDL	Pearson Correlation	-0.353**
	Sig. (2-tailed)	0.003
Systolic blood pressure	Pearson Correlation	0.353**
	Sig. (2-tailed)	0.003
Diastolic blood pressure	Pearson Correlation	0.474**
	Sig. (2-tailed)	0.000
Fasting blood glucose	Pearson Correlation	0.282*
	Sig. (2-tailed)	0.018

* = Significant

** = Highly significant

Discussion

Characteristics of the sample

In the current study, the metabolic effects of typical and atypical antipsychotics were studied in patients diagnosed with schizophrenia who were not experiencing any significant metabolic illness before the commencement of the drug treatment. We found that about 47% of the whole schizophrenic sample studied showed a metabolic syndrome diagnosis (according to the ATP III criteria) with nine patients out of 35 (25.7%) in Group A (FGA) and 24 patients out of 35 (68.6%) in Group B (SGA). Results were in keeping with studies

from the UK (57%), US (49.2%) and a Danish study done by Karoline Krane-Gartiser 2008¹² for 112 patients that found the overall prevalence of the metabolic syndrome among both FGA and SGA to be 41.1%, which is similar to the rates in our current study and can be explained on the basis of genetic predisposition or on sociocultural similarities as regards to eating habits and lifestyle. Our data were also similar to the overall international prevalence of 32.5% reported by Mitchell *et al.*¹³ and with a 30-49% MS rate in US participants as carried out by Holt RIG *et al.* (2015).¹⁴ As a possible explanation for our high percent figures for metabolic syndrome, it is apparent that second generation antipsychotic drugs are much more expensive than the

first generation drugs; they were affordable to patients from higher socioeconomic levels who have different eating habits and hence different susceptibilities to the components of the metabolic syndrome our results not going with some other international studies conducted in psychotic patients (as in a Tunisian study done in 2011 by A Ezzaher¹⁵ with prevalence of metabolic syndrome equals to 26.1%, also in study rates reported from Thailand¹⁶ with prevalence of (22.8%), Mexico¹⁷ with prevalence of (21%) and Spain¹⁸ with prevalence of (26.5%), is present in one study done at Tanta University by El-Sherbiny¹⁹ where it was found that 30.5% of the employees studied had suffered from metabolic syndrome without taking any medication ever. Therefore, it can be somehow understood that our figures did not match some western studies.

Duration of treatment showed a significant relationship with metabolic syndrome in both groups. The result supported a study done in Thailand by Srisurapanont *et al.*²⁰ who found that schizophrenic patients are likely to develop metabolic syndrome abnormalities that may progress rapidly and meet the criteria for metabolic syndrome within a year or more of follow-up. This confirms our finding that duration after one year has a significant effect on prevalence of metabolic syndrome. Conversely, another study by PemChuki *et al.*²² found the prevalence of metabolic syndrome was not observed to be higher than in the general population probably due to shorter exposure of therapy, differences in genetic profile, level of urbanization, lifestyle and socioeconomic status.²¹

Recommendation

The treatment of schizophrenia should involve a balance in terms of risks and benefits.

Supporting programs aimed at increasing monitoring of simple laboratory and clinical measures associated with metabolic syndrome may decrease important risk factors, improve patients' quality of life, and reduce healthcare costs.

References

1. Hagg S, Lindblom Y, Mjorndal T, Adolfsson R. High prevalence of the metabolic syndrome among a Swedish cohort of patients with schizophrenia. *Int Clin Psychopharmacol.* 2006;21(2): 93-98
2. Elligord VL, Taylor SF, Brook RD, Evans SJ, Zollner SK, Grove TB et al. Dietary lifestyle and pharmacogenetic factors associated with arteriole endothelial dependent vasodilatations in schizophrenic patients. *Schizophr Res.* 2011;130(1-3):20-25.
3. Dweyer DS, Donohoe D. Induction of hyperglycemia in mice with atypical antipsychotic drug that inhibit glucose uptake. *Pharmacol Biochem Behav.* 2003; 75(2):255-260.
4. Liese A, Mayer-Davis E, Haffner S. Development of the multiple metabolic syndrome: an epidemiologic perspective. *Epidemiol Rev.* 1998;20(2):157-172.

5. Brown S. Excess mortality of schizophrenia. A meta-analysis. *Br J Psychiatry.* 1997; 171:502-508.
6. Alberti K, Zimmet P. Definition, diagnosis, and classification of diabetes mellitus and its complications, pt 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. *Diabet Med.* 1998;15(7):539-553.
7. American Heart Association. Syndrome X or metabolic syndrome. July 29, 2003.
8. Bustillo JR, Buchanan RW, Irish D. et al. Differential effect of clozapine on weight: a controlled study. *Am J Psychiatry.* 1996;153:817-819.
9. Isomaa B, Almgren P, Tuomi T. et al. Cardiovascular morbidity and mortality associated with the metabolic syndrome. *Diabetes Care.* 2001;24(4):683-689.
10. International classification of diseases tenth edition, World Health Organization, 1994.
11. Executive summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *JAMA.* 2001;285(19):2486-97.
12. Krane-Gartiser K1, Breum L, Glümrr C, Linneberg A, Madsen M, Køster A. Prevalence of the metabolic syndrome in Danish psychiatric outpatients treated with antipsychotics. *Indian J Endocrinol Metabol.* 2012;16(1):67-71
13. Mitchell AJ, Vancampfort D, Sweers K, Van Winkel R, Yu W, De Hert M. Prevalence of metabolic syndrome and metabolic abnormalities in schizophrenia and related disorders-a systematic review and meta-analysis. *Schizophr Bull.* 2013;39(2):306-318. doi
14. Holt RIG, Mitchell AJ. Diabetes mellitus and severe mental illness: mechanisms and clinical implications. *Nat Rev Endocrinol.* 2015;11(2):79-89.
15. Asma E, Dhouha HM, Anwar M, Asma O, Fadoua N, Wahiba D, et al. Hyperhomocysteinemia in Tunisian bipolar I patients psychiatry and clinical neurosciences 2011.
16. Srisurapanont M, Likhitsathian S, Boonyanaruthee V, Charnsilp C, Jarusuraisin N. Metabolic syndrome in Thai schizophrenic patients: a naturalistic one-year follow-up study. *BMC Psychiatry.* 2007;7:14. doi: 10.1186/1471-244X-7-14. Pmid: 1744-8257.
17. Díaz-Domínguez DA, de la Rosa-Donlucas F, Romans-Demaria L, Grajales-Almeida JR, Sauer-Vera T, Sotelo-Monroy GE. Prevalence of metabolic syndrome and associated risk factors in hospitalized patients with schizophrenia in Mexico. *Int J Ment Health.* 2013;42: 95-104.
18. Arango C, Bobes J, Aranda P, Carmena R, Garcia-Garcia M, Rejas J. A comparison of schizophrenia outpatients treated with antipsychotics with and without metabolic syndrome: Findings from the CLAMORS study. *Schizophr Res.* 2008;104(1-3):1-12. doi: 10.1016/j.schres.2008.
19. El-Sherbiny AM 1¥, Zaid. H 2 Metabolic Syndrome among Tanta Faculty of Medicine administrative employees. *Public Health and Community Medicine Department, Faculty of Medicine, Tanta University, Egypt. Bull High Inst Public Health.* 2014; 44(2):61-68.
20. Srisurapanont M, Likhitsathian S, Boonyanaruthee V, Charnsilp C, Jarusuraisin N. Metabolic syndrome in Thai schizophrenic patients: a naturalistic one-year follow-up study. *BMC Psychiatry.* 2007;7:14.

21. Pem C, Gupta AK, Sharma AK. Incidence of Metabolic Syndrome in Patients with Psychosis Receiving

Antipsychotic Drugs. Indian J Pharmacol. 2014; 46(Suppl 1):S62-S113.

الملخص

مقدمه: متلازمة الايض هي السبب الرئيسي لكثير من الامراض والوفيات في المرضى الذين يعانون من الفصام الذهاني. **الهدف:** اهداف هذا البحث لتحديد مدة العلاج كعامل خطورة لمتلازمة الايض في عينه من المرضى الذين يعانون من مرض الفصام الذهاني بالإسماعيلية. **الطريقة:** هذه الدراسة تم اجرائها على (70) من المرضى المصابين بمرض الفصام الذهاني تم تشخيصهم وفق التصنيف الدولي للأمراض النفسية النسخة العاشرة ويتعاطون مضادات الذهان. **النتيجة:** وجد ارتفاع في نسبة المصابين بمتلازمة الايض للمرضى الذين يتعاطون الجيل الثاني من مضادات الذهان عن الذين يتعاطون الجيل الاول من الذهان. وجود دلالة إحصائية بين مدة العلاج بمضادات الذهان و متلازمة الايض.

Corresponding author

Dr Khaled Abd El Moez Assistant Professor of Psychiatry, Faculty of Medicine, Suez Canal University, Ismailia - Egypt
Email: naomsal2015@gmail.com , naomsal2012@hotmail.com

Authors

Professor Magda Taha Fahmy Professor of psychiatry department, Faculty of medicine, Suez Canal University, Ismailia - Egypt

Dr Khaled Abd El Moez Assistant professor of psychiatry department, Faculty of medicine, Suez Canal University, Ismailia - Egypt

Dr Haydy Hassan lecturer of psychiatry department, Faculty of medicine, Suez Canal University, Ismailia - Egypt

Dr Basma Ahmed Psychiatry and Neurology specialist. Ministry of Health, Alexandria - Egypt

Advances in Understanding the Etiology of Schizophrenia

Adib Essali

التقدم في فهم أسباب اضطراب الفصام

اديب العسالي

Abstract

Schizophrenia is a complex disorder. Family, twin and adoption studies demonstrate that genetic and environmental components contribute to the etiology of schizophrenia. Environmental factors include growing up in an urban environment, immigration, cannabis usage, male gender, perinatal events and pregnancy during famines.

The genetic component seems to include genes distributed across the human genome. Determining the genomic location and identity of schizophrenia risk genes can be done using either the methods of linkage or association. Linkage studies utilizing genetic markers have identified a variety of genes that could be linked to schizophrenia. However, linkage is observed on most chromosomes and covers thousands of genes with small effect sizes. Association studies are more useful for gene identification in complex disorders with a polygenic mode of inheritance such as schizophrenia.

Genetic association studies investigate the correlation between disease status and a genetic marker in people with or without schizophrenia. The advantage of association studies is the possibility to recruit a large sample size with enough power to detect genes of moderate effect. The completion of the human genome project and the availability of information on more than 3.1 million genetic markers across the human genome have paved the way to conduct genome-wide association studies (GWAS). As many as 500,000 SNPs have been tested in GWAS for association with schizophrenia.

The Schizophrenia Working Group of the Psychiatric Genomics Consortium (PGC) was created with the aim to maximize sample size by combining GWAS data from multiple international research groups. Significant schizophrenia associations were identified in 108 distinct loci. The most significant association was in the major histocompatibility complex (MHC) on the short arm of chromosome 6. A recent study of tens of thousands of people with and without schizophrenia has shown that the association of schizophrenia to the MHC locus was strongest at the C4 gene encoding for complement component 4. The expression of C4 is related to "synaptic pruning". This biological process provides a potential etiological link between the genetic makeup and the development of schizophrenia.

Identifying biological mechanisms that link genetic findings to clinical manifestations of schizophrenia will help advance the diagnosis, treatment and prevention of schizophrenia.

Keywords: schizophrenia, genome, genetic.

Declaration of interest: None

Introduction

Schizophrenia is a devastating psychiatric disorder that has a lifetime prevalence of approximately 1% worldwide, and is associated with substantial morbidity and mortality as well as personal and societal costs.¹⁻³ It is characterized by the occurrence of delusions, hallucinations, disorganized speech, alterations in drive and volition, impaired cognition, and mood symptoms.⁴

The underlying causes and pathogenesis of schizophrenia remain unknown. However, research has demonstrated the importance of both environmental and genetic risk factors in the development of this complex disorder.

Environmental risk factors

The risk of developing schizophrenia is associated with a variety of environmental factors including growing up in an urban environment, immigration, cannabis usage, male gender and perinatal events (hypoxia, maternal infection, stress, and malnutrition).⁴⁻⁵ Obstetrical complications increase the risk of later development of schizophrenia two-fold.⁶ These complications include hemorrhage, preterm labor, blood-group incompatibilities, fetal hypoxia and maternal infection.⁷

Pregnancy during famines in the Netherlands (1944 through 1945)⁸ and in China^{9,10} has been associated with a two-fold risk of schizophrenia in the offspring. This may indicate that maternal nutrition is a factor in the development of schizophrenia. Increased prenatal maternal stress has been proposed as the common pathophysiological mechanism underlying risk factors, such as famine, bereavement, and antenatal infection.

Initial findings from retrospective studies about the relationship between cannabis and psychosis were inconclusive regarding whether using cannabis was a result or a risk factor for developing psychosis. Well-controlled studies have subsequently supported the hypothesis that cannabis use is the risk factor and psychosis is the result.^{11,12}

A higher prevalence of schizophrenia has been repeatedly demonstrated in immigrant populations compared to native-born populations.^{13,14}

Genetic risk factors

Family, twin and adoption studies demonstrate a strong genetic component contributing to the etiology of schizophrenia.¹⁵ Twin studies have been conducted in monozygotic and dizygotic twins to examine concordance rates of schizophrenia within the twin pairs. The observed concordance rate in monozygotic twins, who share 100 percent of their genes, is about 40% to 50%, whereas the observed concordance rate in dizygotic twins, who share 50% of their genes, is about 10% to 15%.^{18,19,20} The increased concordance rate of schizophrenia in monozygotic compared to dizygotic twins suggests a strong genetic component to schizophrenia. The offspring of the unaffected monozygotic twins are at increased risk of schizophrenia, which further supports the existence of a genetic predisposition for the illness. The fact that the monozygotic twin concordance rate is less than 100%, however, supports a significant role for non-genetic, environmental factors in the etiology of the disorder.^{21,22,23} The heritability of schizophrenia was estimated to be 81% in a meta-analysis of twin studies¹⁶ and 64% in a recent Swedish study of more than two million families.¹⁷

Despite the abundant evidence for genetic risk factors, the specific genes involved in the etiology of schizophrenia have not been identified. The results of recent genetic studies are promising.

Genetics is the study of heredity, which describes how some traits are passed from parents to their children. Traits (phenotype) are dictated by the gene makeup (genotype). Genes usually come in pairs (alleles) and are found on loci on chromosomes; two alleles are inherited for each trait. Alleles are alternative versions of a gene, i.e. different gene possibilities for the same trait. Some traits, such as blood type, may have multiple alleles whereas the gene

that codes for a single trait may have three or more alleles. This is called polymorphism, and a locus that comes in several forms is called polymorphic.

With the advent of molecular genetics, attempts to study the genetic mechanism underlying schizophrenia has taken the form of studying candidate gene polymorphism suspected of being related to schizophrenia, or studying DNA markers spanning the whole genome. Initial studies have used candidate gene approaches, or genetic linkage, to identify specific genes as candidates for an etiological role in the development of schizophrenia. Studies using genetic markers, or association studies, offer a more direct approach to the identification and localization of genes and the eventual understanding of the molecular basis of disorder.

Genetic markers

A genetic marker is a gene or DNA sequence that is polymorphic, having two or more alleles, with a known location on a chromosome. It can be described as a DNA variation that can be observed. A genetic marker may be a short DNA sequence, such as a single nucleotide polymorphism (SNP), or a long one, such as microsatellite polymorphism, (or simple sequence repeat - SSR). Other commonly used types of genetic markers are restriction fragment length polymorphism (RFLP), simple sequence length polymorphism (SSLP), amplified fragment length polymorphism (AFLP), random amplification of polymorphic DNA (RAPD), variable number tandem repeat (VNTR), short tandem repeat (STR), single feature polymorphism (SFP), diversity arrays technology (DArT) and restriction site associated DNA markers (RAD markers). Some of these markers - collectively termed copy number variations (CNVs) - are DNA sections that are repeated and the number of these repeats varies between individuals,³¹ thus contributing to the genome variability among individuals.

Genetic markers may arise “de novo” due to mutation in the chromosomal loci, or may be inherited. Investigating rare inherited (as opposed to de novo) alleles in schizophrenia has become possible during the past few years following the development of new DNA sequencing technology. Mutation can occur in two ways: chromosomal mutation and gene mutation. Gene or point mutation is a random SNP mutation. It is more common, but less drastic than chromosomal mutation. It alters only one gene producing alleles, which are not inherited. Such newly arising (de novo) mutations have been shown to

contribute to the risk of developing schizophrenia despite the fact that much of that risk is inherited.²⁴ The occurrence of de novo mutation is positively correlated with paternal age at conception,²¹⁻²² which is associated with increased schizophrenia risk.²³ Moreover, there is molecular evidence associating de novo mutation with schizophrenia, with some evidence for a higher rate among patients with no family history of the disorder.²⁴⁻²⁶ Genes disrupted by de novo mutation in schizophrenia have provided novel insights into biological pathways underlying the disorder. They include, for instance, genes involved in synaptic plasticity.²⁷

CNVs could be caused by a chromosomal mutation resulting in chromosomal aberrations. The study of chromosomal aberrations in families with schizophrenia was an early method for investigating the genetics of schizophrenia.²⁸⁻²⁹ Such studies have provided evidence for the location of schizophrenia risk loci in chromosomal regions. The deletion of a section of 22q11 was the first schizophrenia-associated CNV. It leads to the phenotype of velocardiofacial (DiGeorge) syndrome that includes abnormalities in facial features and the palate, and midline heart defects. The prevalence rate of schizophrenia in patients with DiGeorge syndrome is as high as 18%. The prevalence of DiGeorge syndrome in the general population is 0.025%, and it rises to 2% in people diagnosed with schizophrenia.³⁰⁻³¹

Analyses of rare CNVs have revealed associations at more than 15 loci.³²⁻³⁷ However, although they are collectively found in around 2.5% of schizophrenia patients,³⁷ the individual contribution of these loci to the total population variation in schizophrenia genetic risk is small.³⁸ In addition, schizophrenia-associated CNVs have been shown to predispose to several major psychiatric disorders, including bipolar disorder, major recurrent depression, addictions, impulse control disorders and others.³⁹⁻⁴⁰

Gene finding

Although schizophrenia heritability is so high that its risk is increased approximately 10-fold in first-degree relatives,⁴¹ it is clear from genetic epidemiological studies⁴²⁻⁴³ that the risk is likely to be due to multiple genes of small effect.⁴⁴ The observation that schizophrenia has a polygenic mode of inheritance and the introduction of different types of DNA markers to serve as reference points throughout the human genome have inspired studies aimed at determining the genomic location and

identity of schizophrenia risk genes using either the methods of linkage or association.⁴⁵⁻⁴⁶

Linkage studies

Genetic linkage is the tendency of genes that are close together on a chromosome to be inherited together. Linkage studies are family based analyses that utilize genetic markers and clinical information from multiple affected individuals in a given family to identify regions of the genome that are co-inherited with schizophrenia. In other words, linkage studies seek to find chromosomal regions within families that tend to be shared among affected relatives but not among unaffected relatives. Therefore, if a genetic marker is inherited with schizophrenia, then it can be concluded that the risk gene(s) for schizophrenia are located on the chromosome close to that marker.

A variety of genes has been identified by family studies utilizing SNPs genetic markers. These include dystrobrevin binding protein 1 (dysbindin, DTNBP1, 6p22.3),⁴⁷ neuregulin 1 (NRG1, 8p12),⁴⁸ and D-amino acid oxidase activator (DAOA, 13q24).⁴⁹ A meta-analysis of 32 genome-wide linkage studies across 3,255 families including 7,413 individuals with schizophrenia suggested linkage in two regions: 5q and 2q.⁵⁰

A major problem with linkage studies is that linkage is observed on most chromosomes and covers thousands of genes with small effect sizes. Linkage studies are usually successful for linking diseases to a single gene or to a chromosomal area containing a small number of genes. They are less useful with complex disorders related to many genes of small effect size such as schizophrenia. Association studies have proved more useful in identifying the genetic basis for psychiatric disorders including schizophrenia.

Association studies

The use of association studies for gene identification in complex disorders such as schizophrenia was proposed because of the limited power of linkage studies to identify genes of modest effect.⁵¹ Genetic association studies are population-based studies grounded on the hypothesis that common complex disorders are due to interactive contribution of multiple genes each with a small effect size, and that a significant proportion of unrelated affected

individuals will share the risk alleles. Accordingly, genetic association studies aim to identify risk genes by studying the correlation between disease status and a genetic marker through measuring the frequency of a specific genetic marker in people with schizophrenia and compare it to the frequency of that marker in controls. SNPs are the most widely tested markers in association studies. A higher frequency of an SNP allele in a series of individuals affected with schizophrenia can mean that the tested allele affects the risk of schizophrenia.

The advantage of association studies is the possibility to recruit a large sample size with enough power to detect alleles of moderate effect. The completion of the human genome project⁵² and the availability of information on more than 3.1 million SNPs across the human genome⁵³⁻⁵⁴ have paved the way to conduct genome-wide association studies (GWAS). As many as 500,000 SNPs have been tested in GWAS for association with schizophrenia. GWAS of SNPs have identified a number of common schizophrenia risk alleles.⁵⁵⁻⁵⁷ Each of these alleles has a weak effect on the risk of developing schizophrenia, but together they are thought to account for a third to a half of the variation in schizophrenia genetic risk.^{55,58-59}

Early schizophrenia GWAS suggested that very large samples were required because of the modest effect size of detected risk alleles. The Schizophrenia Working Group of the Psychiatric Genomics Consortium (PGC) was created with the aim to maximize sample size by combining GWAS data from multiple international research groups, in order to combine all available schizophrenia samples with published or unpublished GWAS genotypes into a single, systematic analysis.⁶⁰ This collaboration has made it possible to analyze genome-wide genotype data of up to 36,989 cases and 113,075 controls from 49 case-control samples (46 of European and three of east Asian ancestry, 34,241 cases and 45,604 controls) and three family-based samples of European ancestry (1,235 parent affected offspring trios). Significant schizophrenia associations were identified in 108 distinct loci.⁵⁷ The most significant allelic association was in the major histocompatibility complex (MHC) on the short arm of chromosome 6.⁵⁷

The MHC's involvement in immunity suggested that immune dysfunction might play a role in the etiology of schizophrenia. However, a recent study has provided an alternative suggestion and a novel insight into the biological basis of schizophrenia.⁶¹ This study involved analysing SNPs, implicating the MHC locus in 28,799

schizophrenia cases and 35,986 controls, from 40 cohorts in 22 countries contributing to the PGC. The association of schizophrenia to the MHC locus was strongest at the C4 gene encoding for complement component 4. The expression of complement component 4 allele A (C4A) was proportional to the risk of having schizophrenia.⁶¹ C4 expression and activity were then tested in mouse models and shown to be related to "synaptic pruning", i.e. elimination of connections between neurons. Thus, a person's risk of schizophrenia is increased if they inherit specific variants in a gene related to "synaptic pruning". These findings provide a potential etiological link between the development of schizophrenia and a biological process determined by specific gene variants. Excessive synaptic pruning, due to increased complement (C4) activity, bring together a number of diverse observations. Synaptic pruning is particularly active during adolescence, and it is clinically known that schizophrenia usually manifest late in adolescence or early in adulthood. This may also explain the reduced numbers of synapses⁶²⁻⁶⁴ and the excessive loss of grey matter⁶⁵⁻⁶⁶ in the brains of individuals with schizophrenia.

Beyond providing a new insight into the biological origins of schizophrenia, contemporary genetic research may suggest a new approach to the early detection of schizophrenia and to developing new therapies. Prevention may also become possible through interventions aimed, for example, at reducing synaptic pruning in individuals who show early symptoms of schizophrenia.

Conclusion

Schizophrenia is a complex disorder. Twin and adoption studies suggest that genetic and environmental factors are both extremely important in the etiology of schizophrenia. It is now established that the genetic risk of schizophrenia involves inherited and de novo risk alleles distributed across a large number of genes. Linkage studies are a powerful means to locate genes for disorders related to one or few genes. They are less useful in complex disorders like schizophrenia related to multiple genes each with a modest effect. Association studies can help identify common genetic risk factors even with very small effect size. The methods used for mapping risk genes have progressed enormously over the past several years. Advances in understanding the genetics of schizophrenia have resulted from applying modern genotyping technologies and from collaborative efforts on a global scale. A marked progress in understanding the genetic risk of developing schizophrenia at the DNA level has resulted from the publication of the sequence of the human genome

and the documentation of population variation in that sequence.

Schizophrenia research has demonstrated that genetic factors have an important role to play in its etiology. The main conclusion is that schizophrenia is a polygenic disorder. Some convergent biological themes are emerging. Current research efforts are attempting to link genetic findings to clinical and biological phenotypes. Understanding the biology of the disease-associated genes will help in identifying novel targets for the detection, prevention and treatment of schizophrenia.

References

- Saha S, Chant D, McGrath J. A systematic review of mortality in schizophrenia: is the differential mortality gap worsening over time? *Arch Gen Psychiatry*. 2007;64(10):123-1131.
- World Health Organization. *The Global Burden of Disease: 2004 Update* (WHO Press, 2008).
- Knapp M, Mangalore R, Simon J. The global costs of schizophrenia. *Schizophr Bull*. 2004;30(2): 279-293.
- Van Os J, Kapur S. Schizophrenia. *Lancet* 2009; 374(9690):635-645.
- Tandon R, Keshavan MS, Nasrallah HA. Schizophrenia, "just the facts" what we know in 2008. 2. Epidemiology and etiology. *Schizophr Res*. 2008;102(1-3):1-18.
- Clarke MC, Harley M, Cannon M. The role of obstetric events in schizophrenia. *Schizophr Bull*. 2006;32(1):3-8.
- Brown AS, Derkits EJ. Prenatal infection and schizophrenia: a review of epidemiologic and translational studies. *Am J Psychiatry*. 2010;167(3):261-280.
- Susser E, Neugebauer R, Hoek HW, Brown AS, Lin S, Labovitz D, Gorman JM. Schizophrenia after prenatal famine. Further evidence. *Arch Gen Psychiatry*. 1996;53(1):25-31.
- St Clair D, Xu M, Wang P, Yu Y, Fang Y, Zhang F, et al. Rates of adult schizophrenia following prenatal exposure to the Chinese famine of 1959-1961. *JAMA*. 2005;294(5): 557-562.
- Xu MQ, Sun WS, Liu BX, Feng GY, Yu L, Yang L, et al. Prenatal malnutrition and adult schizophrenia: further evidence from the 1959-1961 Chinese famine. *Schizophr Bull*. 2009;35(3):568-576.
- Kuepper R, van Os J, Lieb R, Wittchen HU, Höfler M, Henquet C. Continued cannabis use and risk of incidence and persistence of psychotic symptoms: 10 year follow-up cohort study. *Br Med J*. 2011;342:d738.
- McGrath J, Welham J, Scott J, Varghese D, Degenhardt L, Hayatbakhsh MR, et al. Association between cannabis use and psychosis-related outcomes using sibling pair analysis in a cohort of young adults. *Arch Gen Psychiatry*. 2010;67(5):440-447.
- Werbelloff N, Levine SZ, Rabinowitz J. Elaboration on the association between immigration and schizophrenia: a population-based national study disaggregating annual trends, country of origin and sex over 15 years. *Soc Psychiatry and Psychiatr Epidemiol*. 2012;47:303.
- Bourque F, van der Ven E, Malla A. A meta-analysis of the risk for psychotic disorders among first- and second-generation immigrants. *Psychol Med*. 2011;41(5):897-910.
- Gottesman II: *Schizophrenia Genesis: The Origins of Madness*. Henry Holt & Company Inc New York; 1991.
- Sullivan PF, Kendler KS, Neale MC. Schizophrenia as a complex trait: evidence from a meta-analysis of twin studies. *Arch Gen Psychiatry*. 2003;60:1187-1192.
- Lichtenstein P, Yip BH, Bjork C, et al. Common genetic determinants of schizophrenia and bipolar disorder in Swedish families: a population-based study. *Lancet*. 2009;373(9659):234-239.
- Kringlen E. Twin studies in schizophrenia with special emphasis on concordance figures. *Am J Med Genet*. 2000;97(1):4-11.
- Cardno AG, Marshall EJ, Coid B, Macdonald AM, Ribchester TR, Davies NJ, et al. Heritability estimates for psychotic disorders: the Maudsley twin psychosis series. *Arch Gen Psychiatry*. 1999;56(2):162-168.
- Cannon TD, Kaprio J, Lönnqvist J, Huttunen M, Koskenvuo M. The genetic epidemiology of schizophrenia in a Finnish twin cohort. A population-based modeling study. *Archives of General Psychiatry* 1998;55(1): 67-74.
- Veltman JA, Brunner HG. De novo mutations in human genetic disease. *Nat Rev Genet*. 2012;13(8): 565-75.
- Kong A, Frigge ML, Masson G, Besenbacher S, Sulem P, Magnusson G, et al. Rate of de novo mutations and the importance of father's age to disease risk. *Nature* 2012; 488:471-475.
- McGrath JJ, Petersen L, Agerbo E, Mors O, Mortensen P, Pedersen C. A comprehensive assessment of parental age and psychiatric disorders. *JAMA Psychiatry*. 2014;71(3): 301-309.
- Kirov G, Pocklington AJ, Holmans P, Ivanov D, Ikeda M, Ruderfer D, et al. De novo CNV analysis implicates specific abnormalities of postsynaptic signalling complexes in the pathogenesis of schizophrenia. *Mol Psychiatry*. 2012;17(2):142-153.
- Malhotra D, McCarthy S, Michaelson Jacob J, Vacic V, Burdick Katherine E, Yoon S, et al. High frequencies of de novo CNVs in bipolar disorder and schizophrenia. *Neuron* 2011;72(6):951-963.
- Xu B, Roos JL, Levy S, van Rensburg EJ, Gogos JA, Karayiorgou M. Strong association of de novo copy number mutations with sporadic schizophrenia. *Nat Genet*. 2008;40(7):880-885.
- Mccarroll SA, Altshuler DM. Copy-number variation and association studies of human diseases. *Nat Genet*. 2007;39(7 Suppl):S37-42.
- Shastri BS. Recent developments in the genetics of schizophrenia. *Neurogenet*. 1999;2(3):149-154.
- Blackwood DH, Thiagarajah T, Malloy P, Pickard BS, Muir WJ. Chromosome abnormalities, mental retardation and the search for genes in bipolar disorder and schizophrenia. *Neurotox Res*. 2008;14:113-120.
- Karayiorgou M, Morris MA, Morrow B, et al. Schizophrenia susceptibility associated with interstitial

- deletions of chromosome 22q11 Proc Natl Acad Sci. USA 1995;92(17):7612-7616.
31. Murphy KC Schizophrenia and velo-cardio-facial syndrome. *Lancet* 2002;359(9304):426-430.
 32. Blackwood DH, Fordyce A, Walker MT, St Clair DM, Porteous DJ, Muir WJ. Schizophrenia and affective disorders-cosegregation with a translocation at chromosome 1q42 that directly disrupts brain-expressed genes: clinical and P300 findings in a family. *Am J Hum Genet.* 2001;69(2):428-433.
 33. Millar JK, Wilson-Annan JC, Anderson S, et al. Disruption of two novel genes by a translocation co-segregating with schizophrenia. *Hum Mol Genet.* 2000;9(9):1415-1423.
 34. St Clair D, Blackwood D, Muir W, et al. Association within a family of a balanced autosomal translocation with major mental illness. *Lancet* 1990;336(8706): 13-16.
 35. Szatkiewicz JP, O'Dushlaine C, Chen G, Chambert K, Moran JL, Neale BM, et al. Copy number variation in schizophrenia in Sweden. *Mol Psychiatry.* 2014;19(7):762-773.
 36. Morris DW, Pearson RD, Cormican P, Kenny EM, O'Dushlaine CT, Perreault L-PL, et al. An inherited duplication at the gene p21 Protein-Activated Kinase 7 (PAK7) is a risk factor for psychosis. *Hum Mol Genet.* 2014;23(12):3316-3326.
 37. Rees E, Walters JTR, Georgieva L, Isles AR, Chambert KD, Richards AL, M et al. Analysis of copy number variations at 15 schizophrenia-associated loci. *Br J Psychiatry.* 2014;204(2):108-114.
 38. Robinson MR, Wray NR, Visscher PM. Explaining additional genetic variation in complex traits. *Trends Genet.* 2014;30(4):124-132.
 39. Kirov G, Rees E, Walters TJ, Escott-Price V, Georgieva L, Richards AL, et al. The penetrance of copy number variations for schizophrenia and developmental delay. *Biol Psychiatry.* 2014;75(5):378-385.
 40. Malhotra D, Sebat J. CNVs: Harbingers of a rare variant revolution in psychiatric genetics. *Cell.* 2012;148(6): 1223-1241.
 41. Owen MJ, O'Donovan MC, Gottesman II. Schizophrenia. In: McGuffin P, Owen MJ, Gottesman II, editors. *Psychiatric genetics and genomics.* Oxford: Oxford Medical Publishers; 2002. pp. 247-266.
 42. Gottesman II, Shields J. A polygenic theory of schizophrenia. *Proc Natl Acad Sci USA* 1967;58(1):199-145.
 43. McGue M, Gottesman II. A single dominant gene still cannot account for the transmission of schizophrenia. *Arch Gen Psychiatry.* 1989; 46:478-480.
 44. Risch N. Genetic linkage and complex diseases, with special reference to psychiatric disorders. *Genet Epidemiol.* 1990;7:3-16.
 45. Botstein D, White RL, Skolnick M, Davis RW. Construction of a genetic linkage map in man using restriction fragment length polymorphisms. *Am J Hum Genet.* 1980;32(3):314-331.
 46. Donis-Keller H, Green P, Helms C, et al. A genetic linkage map of the human genome. *Cell.* 1987;51:319-337.
 47. Straub RE, Jiang Y, MacLean CJ, et al. Genetic variation in the 6p22.3 gene DTNBP1, the human ortholog of the mouse dysbindin gene, is associated with schizophrenia. *Am J Hum Genet.* 2002;71(4):337-348.
 48. Stefansson H, Sigurdsson E, Steinthorsdottir V, et al. Neuregulin 1 and susceptibility to schizophrenia. *Am J Hum Genet.* 2002;71(4):877-892.
 49. Chumakov I, Blumenfeld M, Guerassimenko O, et al. Genetic and physiological data implicating the new human gene G72 and the gene for D-amino acid oxidase in schizophrenia. *Proc Natl Acad Sci USA.* 2002; 99:(21) 13675-13680.
 50. Ng MY, Levinson DF, Faraone SV, et al. Meta-analysis of 32 genomewide linkage studies of schizophrenia. *Mol Psychiatry* 2009;14(8):774-785.
 51. Risch N, Merikangas K. The future of genetic studies of complex human diseases. *Science.* 1996;273(5281):1516-1517.
 52. Lander ES, Linton LM, Birren B, Nusbaum C, Zody MC, Baldwin J, et al. Initial sequencing and analysis of the human genome. *Nature* 2001;409:860-921.
 53. Sachidanandam R, Weissman D, Schmidt, et al. A map of human genome sequence variation containing 1.42 million single nucleotide polymorphisms. *Nature* 2001;409: 928-933.
 54. Frazer KA, Ballinger DG, Cox DR, et al. A haplotype map of the human genome. *Nature* 2005;437: 1299-1320A second generation human haplotype map of over 3.1 million SNPs. *Nature* 2007; 449:851-861.
 55. Ripke S, O'Dushlaine C, Chambert K, Moran JL, Kahler AK, Akterin S, et al. Genome-wide association analysis identifies 13 new risk loci for schizophrenia. *Nat Genet.* 2013;45(10):1150-1159.
 56. Schizophrenia Psychiatric Genome-Wide Association Study (GWAS) Consortium: Genome-wide association study identifies five new schizophrenia loci. *Nat Genet.* 2011;43(10):969-976.
 57. Schizophrenia Working Group of the Psychiatric Genomics Consortium: Biological insights from 108 schizophrenia associated genetic loci. *Nature* 2014; 511(7510):421-427.
 58. International Schizophrenia Consortium, Purcell SM, Wray NR, Stone JL, Visscher PM, O'Donovan MC, Sullivan PF, Sklar P: Common polygenic variation contributes to risk of schizophrenia and bipolar disorder. *Nature* 2009;460(7256):748-752.
 59. Lee SH, DeCandia TR, Ripke S, Yang J, PGC-SCZ, ISC, MGS, Sullivan PF, Goddard ME, Keller M.C. et al. Estimating the proportion of variation in susceptibility to schizophrenia captured by common SNPs. *Nat Genet.* 2012;44(3):247-250.
 60. Psychiatric GWAS Consortium: A framework for interpreting genome-wide association studies of psychiatric disorders. *Mol Psychiatry.* 2009;14(1):10-17.
 61. Sekar A, Bialas AR, de Rivera H, Davis A, Hammond TR, Kamitaki N, et al., Schizophrenia Working Group of the Psychiatric Genomics Consortium, Daly MJ, Carroll MC, Stevens B, McCarroll SA. Schizophrenia risk from complex variation of complement component 4. *Nature* 2016;530:177.
 62. Glausier JR, Lewis DA. Dendritic spine pathology in schizophrenia. *Neuroscience* 2013;251:90-107.

63. Garey LJ, et al. Reduced dendritic spine density on cerebral cortical pyramidal neurons in schizophrenia. *J. Neurol Neurosurg Psychiatry*. 1998;65(4): 446-453.
64. Glantz LA, Lewis DA. Decreased dendritic spine density on prefrontal cortical pyramidal neurons in schizophrenia. *Arch Gen Psychiatry*. 2000;57(1):65-73.
65. Cannon TD, et al. Cortex mapping reveals regionally specific patterns of genetic and disease-specific grey-matter deficits in twins discordant for schizophrenia. *Proc Natl Acad Sci USA*. 2002;99(5):3228-3233.
66. Cannon TD, et al. Progressive reduction in cortical thickness as psychosis develops: a multisite longitudinal neuroimaging study of youth at elevated clinical risk. *Biol Psychiatry*. 2015;77(2):147-157.

المخلص

الفصام اضطراب معقد بينت دراسات العائلات والتوائم والتبني أن لكل من البيئة والوراثة دور في إمرضه. تشتمل العوامل البيئية على العيش في بيئة حضرية، والهجرة، وتعاطي الحشيش، والجنس الذكر، والحوادث حول الولادة، والولادة أثناء المجاعات. أما العوامل الوراثية في الفصام فيبدو أنها تشتمل على جينات موزعة على كامل الجينوم البشري.

يمكن تحديد طبيعة وموقع الجينات الحاملة لخطر الإصابة بالفصام إما بدراسات الارتباط الجيني أو بدراسات التوافق، وقد أدى استخدام دراسات الارتباط الجيني إلى تحديد العديد من الجينات التي قد يوجد ارتباط بينها وبين الفصام، ولكن تم تحديد هذا الارتباط مع معظم الصبغيات بشكل يشمل آلاف الجينات ذات التأثير الضعيف، ومن المعروف أن دراسات التوافق هي الأفضل في مثل هذه الحالات، وهي أكثر فائدة في تحديد جينات الاضطرابات المعقدة ذات الوراثة متعددة الجينات مثل الفصام.

تستقصي دراسات التوافق العلاقة بين المرض وبين واسم جيني في ناس مصابين أو غير مصابين بالفصام، وتمتاز دراسات التوافق بإمكانية تجنيد عينة ضخمة العدد تكفي لكشف جينات ذات تأثير متواضع. وقد أدى اكتمال مشروع الجينوم البشري وتوفر معلومات عن أكثر من 3.1 مليون واسم جيني على عرض الجينوم البشري إلى تهيئ الطريق أمام إجراء دراسات توافق شاملة للجينوم، وقد تمت دراسة توافق الفصام مع ما يقارب نصف مليون واسم جيني.

تم تأسيس مجموعة عمل الفصام ضمن التجمع الجيني الطبقي بهدف تضخيم حجم عينات الدراسة عن طريق دمج بيانات دراسات التوافق الشاملة للجينوم الصادرة عن فرق بحثية عالمية متعددة. تم تحديد ترافقات مهمة للفصام في 108 موقع جيني مختلف، وكان أهم الترافقات في موقع معقد التوافق النسيجي الرئيس على الذراع القصير للصبغي 6، وقد بينت دراسة حديثة لعشرات آلاف الأشخاص المصابين وغير المصابين بالفصام أن توافق الفصام مع موقع معقد التوافق النسيجي الرئيس كان على أشده عند الجين C4 المسؤولة عن مكون المتممة 4.

لمكون المتممة 4 دور في تشذيب عصبونات الدماغ، وتقدم هذه الحديثة البيولوجية إمكانية ربط التكوين الجيني مع الإصابة بالفصام. وبذلك فإن فهم الآليات البيولوجية التي تربط الموجودات الجينية بالمظاهر السريرية للفصام يساعد على تطوير طرق التشخيص والوقاية والعلاج المستخدمة في الفصام.

Author

Dr Adib Essali, MD, PhD, MRC Psych, Affiliate RANZCP

Consultant Psychiatrist, Waikato DHB and Honorary Senior Lecturer, University of Auckland

Manaaki Centre, Mary Street, P O Box 707, Thames 3500 - New Zealand

E-mail: adib-essali@hotmail.com or Adib.Essali@waikatodhb.health.nz

Positive and Negative Symptom Pattern in Schizophrenia

Twana Abdulrahman Rahim, Hemin Fatih Hama Kareem

نمط الأعراض الأيجابية والسلبية لاضطراب الفصام

توانا عبد الرحمن رحيم، هيمين فاتح حمه كريم

Abstract

Objectives: The present study aimed to identify the positive and negative symptoms of patients with schizophrenia as well as estimate their correlations with each other and with patients' basic demographic data. **Methods:** A cross-sectional study assessed both positive and negative symptoms of schizophrenia in N=136 patients with the diagnoses. It was conducted from April to December 2015 at three mental health hospitals in the Sulaimani and Erbil provinces of Iraq's Kurdistan region. The Positive and Negative Syndrome Scale (PANSS) was used and diagnosis of schizophrenia was via ICD-10 checklist. **Results:** Negative symptoms were more evident, with a mean difference of 7.243 points on PANSS, than positive symptoms. Delusions and hallucinations were evident in 43% and 46% of the studied population, respectively. Demographic data, except education, were not significant indicators for schizophrenia symptomatology. It was apparent that improved education was associated with a beta weights of almost 0.3 reduction ($p = 0.001$) in negative symptoms. On correlation matrices of all symptom categories, positive symptoms leaned towards co-occurrences with each other. The same was apparent for the negative symptoms. **Conclusion:** Symptoms appeared on a continuum with significant correlations to each other. However, negative symptoms appeared to be prevailing and, of all demographic variables surveyed, only education tended to affect the occurrences of these symptoms.

Keywords: Negative, positive, schizophrenia

Declaration of Interest: None

Introduction

The characteristic symptoms of schizophrenia involve a range of cognitive, behavioral, and emotional dysfunctions, but no single symptom is pathognomonic of the disorder. Individuals with the disorder will vary substantially in most features, as schizophrenia is a heterogeneous clinical syndrome. Crow, in 1980, was the first to propose that the distinction between positive and negative symptoms in schizophrenia could actually be used to create a typology of schizophrenia that would facilitate the study of its pathophysiology. He proposed that schizophrenia could be divided into two major syndromes, which he referred to as Type 1 and Type 2. Type 1 was characterized by prominent positive symptoms, normal brain structure, relatively good response to treatment and underlying neurochemical mechanism that was probably dopaminergic. Type 2 was characterized by prominent negative symptoms, structural brain abnormalities, impaired cognitive function, and poor response to treatment.¹

The aims of the current study are to address both the positive and negative symptoms among patients with schizophrenia, as well as study which symptom(s) is/are more prevalent and to which extent positive symptoms

persist once the disorder becomes chronic. Additionally, the research addressed possible correlations among schizophrenia symptoms, altogether, as well as correlations of these symptoms with both patients' demographics and illness duration.

Patients and methods

The study design was a convenient, non-probability study; cross-sectional recruitment of all patients with the diagnosis of schizophrenia undergoing in-patient care at the chronic mental hospitals and wards in the Kurdistan region of Iraq. Participants were long-stay patients with schizophrenia at Soz Mental Hospital, Shahid Salahi Muhandis Mental Hospital and the chronic ward of Hawler Mental Hospital. These are the only in-patient health care providers for people with chronic mental disorders who may require long stay in-patient care in the Kurdistan Region of Iraq. Assessment of the patients in the above settings was done during the period of April to December of 2015.

Co-morbid medical and neurological disorders that may share symptoms similar to negative symptoms of schizophrenia, such as Parkinson Disease, were excluded

from the project to avoid confounding misinterpretations of these symptoms.

The current study was approved by the Ethical Committee and the Scientific Research Unit of the Kurdistan Board for Medical Specialties (KBMS). Prior to interview, informed consent was obtained using simple non-medical terms and was written in the participants' native language. In cases where a prospective patient was unable to give consent due to cognitive impairment, the authors sought permission from the relative responsible for that person.

Study procedure: Prior to the initiation of the present study, formal administrative approval was obtained. The researcher introduced himself to the patients and their families and explained the research aims. The researcher visited these chronic mental hospitals once or twice weekly for the assessment. Patients were interviewed in a confidential setting. Then social workers, psychologists and medical staffs provided their reports on each one. Case files for each patient were examined for any additional information.

Methods of assessment: The diagnosis of schizophrenia was based on criteria in The International Classification of Diseases - 10th Edition (ICD 10) and checklist of schizophrenia. Consequently, each patient was assessed by Positive and Negative Syndrome Scale (PANSS) over an average of 30 to 45 minutes.

The ICD-10 is the standard diagnostic tool for epidemiology, health management and clinical purposes. This includes the analysis of the general health situation of population groups. It is used to monitor the incidence and prevalence of diseases and other health problems, proving a picture of the general health situation of countries and populations.^{2,3} According to ICD-10, nine groups of symptoms are important for diagnosing schizophrenia: (1) thought echo, insertion, withdrawal, and broadcasting; (2) delusions of control, influence, or passivity; (3) hallucinatory voices; (4) other persistent delusions that are culturally inappropriate and impossible; (5) persistent hallucinations; (6) breaks or interpolation in thinking; (7) catatonic behavior; (8) cognitive symptoms resulting in social withdrawal and poor social performance, but not caused by depression or medication; and (9) consistent, overall, change in behavior.³

The Positive and Negative Syndrome Scale, or The PANSS is a medical scale used for measuring symptom severity of patients with schizophrenia. It was published

in 1987 by Stanley Kay, Abraham Fiszbein and Lewis Opler. It is widely used in the study of antipsychotic therapy. The name refers to the two types of symptoms in schizophrenia, as defined by the American Psychiatric Association (APA): positive symptoms, which refer to an excess or distortion of normal functions (e.g., hallucinations and delusions), and negative symptoms, which represent a diminution or loss of normal functions.⁴

Of the 30 items included in the PANSS, seven constitute a positive scale, seven a negative scale, and the remaining 16 a general psychopathology scale. The scores for these scales are arrived at by summation of ratings across component items. Therefore, the potential ranges are 7 to 49 for the positive and negative scales, and 16 to 112 for the general psychopathology scale. To assess a patient using PANSS, an approximately 45-minute clinical interview is conducted. The patient is rated from 1 to 7 on 30 different symptoms based on the interview as well as reports of family members or primary care hospital workers.⁵

Statistical procedure: Data were arranged and coded into the computer software named Statistical Package for Social Science (SPSS version 21). Percentage and frequencies were used for categorical variables. To assess the differences among nominal variables, *t*-test was applied when the nominated variable was consisting of two levels. In the above analyses, two-tailed tests with 95% level of Confidence Interval (CI) were packaged.

For interval variables like age, years of formal education and duration of illness, Pearson's *r* correlation analyses were applied, which were two-tailed according to the direction of our hypotheses. Furthermore, correlation coefficients of all symptoms of schizophrenia to each other were calculated to uncover the extent of correlation and co-occurrences of these symptoms altogether. Additionally, a snapshot of the themes of delusion and modalities of hallucination were tabulated across particular demographic data.

Finally, simultaneous multiple regression analysis was conducted to assess the standardized coefficient (B) associations of all demographic variables, together, with the symptom-profile of schizophrenia.

For each MR, the 95% CI was adjusted and prior Correlation Matrices and Collinearity Diagnostics were considered to obtain results that are more accurate. All statistical procedures were tested on probabilities of:

- p value > 0.05 for no statistical significance difference or association.
- p value ≤ 0.05 for significant difference or association.
- p value ≤ 0.01 for highly significant difference or association.

Results

During the current study period, N=136 patients with schizophrenia were recruited: n=48 from Soz Hospital, n=51 from Shahid Salahi Muhandis Hospital and n=37 from Hawler Mental Hospital. Only two patients from Hawler Mental Hospital were ruled out from the study because they were affected by concurrent stroke at the time of the study. Demographic characteristics are shown in Table 1. More than 64 % of the studied patients were men, a significant number (83.1%) were unmarried, and the mean years of formal education was as low as 6.77 years. To test the hypothesis that negative symptoms are more prominent among patients with chronic schizophrenia, a paired-sample t -test was performed. As can be seen in Table 1, negative symptoms were outstandingly more evident, with a mean difference of 7.243 points on PANSS, than positive symptoms that flags to be statistically highly significant ($p < 0.01$).

Table 1. Description of the sample

<i>Number of the total sample</i>		N=136
<i>Age in Years (M±SD)^a</i>		37.9 ± 8.9
<i>Gender</i> <i>N (%)^b</i>	Male	88 (64.7)
	Female	48 (35.3)
<i>Marital Status</i> <i>N (%)^b</i>	Unmarried	113 (83.1)
	Married	23 (16.9)
<i>Formal years of education (M±SD)^a</i>		6.77 ± 4.4
<i>Duration of the illness in months (M±SD)^a</i>		170.4 ± 82.1
<i>PANSS (M±SD)^a</i>	Positive subscale*	15.95 ± 5.4
	Negative subscale*	23.2 ± 6.8
	General subscale	42.65 ± 8.46
	Total PANSS	81.8 ± 17

^a Mean ± Standard Deviation ^b Number (Percent)

* Paired t -test = 11.325; Mean Difference = 7.243; p value < 0.001

Tables 2 and 3 display the mean score of positive and negative symptoms of schizophrenia. As seen from Table 2, Conceptual Disorganization (P2) and Hostility (P7) were the most highly scored; and, Grandiosity (P5) as well as Excitement (P4) the least scored positive symptoms.

Table 2. Positive subscale of PANSS

<i>Positive Symptoms</i>	M±SD^a
P1- Delusions	2.3 ± 1.72
P2- Conceptual disorganization	3.25 ± 1.4
P3- Hallucinatory Behavior	2.5 ± 1.54
P4- Excitement	1.64 ± 1
P5- Grandiosity	1.3 ± 1
P6- Suspiciousness/Persecution	1.8 ± 1.4
P7- Hostility	3.1 ± 1.3
Total P subscale	15.95 ± 5.4

^a Mean ± Standard Deviation

Conversely, among negative symptoms, Table 3 identifies Difficulty in Abstract Thinking (N5) as the highest and Stereotyped Thinking (N7) as the lowest recorded symptoms.

Table 3. Negative subscale of PANSS

Negative symptoms	M±SD^a
N1- Blunted affect	3.1 ± 1.4
N2- Emotional withdrawal	3.6 ± 1.1
N3- Poor rapport	2.8 ± 1.35
N4- Passive/apathetic social withdrawal	3.4 ± 1.4
N5- Difficulty in abstract thinking	4.5 ± 2
N6- Lack of spontaneity and flow of conversation	3.8 ± 1.76
N7- Stereotyped thinking	2.04 ± 1.2
Total N Subscale	23.2 ± 6.8

^a Mean ± Standard Deviation

Table 4 demonstrates different themes of delusion among studied individuals with chronic schizophrenia. Findings suggest that Suspiciousness/Persecution is the most

common theme of delusion whereas Erotomantic, Bizarre and Control are the least common themes.

Table 4. Themes of delusion

Theme (n=58 patients)	No. (%)
Reference	17(29.3)
Control	11 (18.9)
Somatic	18 (31)
Bizarre	9 (15.5)
Erotomantic	4 (6.9)
Grandiosity	13 (22.4)
Suspiciousness /Persecution	38 (65.5)

Table 5 shows types of hallucinations in patients with chronic schizophrenia. Auditory hallucination is the most

and tactile hallucination is the least common type of hallucinations among the studied sample of patients.

Table 5. Hallucinations modalities

Hallucination (n=62 patients)	No. (%)
Auditory	39 (62.9)
Visual	31 (50)
Tactile	5 (8)
Olfactory	13 (20.9)
Gustatory	9 (14.5)

Multiple regression analysis was conducted to determine the best linear combination of age, gender, marital status, education and illness duration for predicting positive symptoms of schizophrenia. The beta weights, presented in Table 6, suggest that none of these variables significantly contributed to the prediction. However, as seen from the same table, increases in age and illness duration as well as being male are associated with less positive symptoms. On the other hand, those who were married and more formally educated presented with more positive symptoms.

Table 6. Simultaneous Multiple regression analysis summary for age, gender, marital status, formal years of education and illness duration predicting positive symptoms (N=136)

Variables	B ^a	SEB ^b	B ^c	95% CI	
				Lower	Upper
Age	-0.032	0.067	-0.053	-0.16	0.1
Gender	-0.698	1.004	-0.062	-2.68	1.28
Marital Status	1.932	1.274	0.134	-0.58	4.45
Formal years of education	0.047	0.11	0.038	-0.17	0.26
Illness duration	-0.004	0.007	-0.06	-0.018	0.01

^a Unstandardized Beta Coefficients

^b Standard Error of B

^c Standardized Beta Coefficients

Likewise, Analogous regression analysis was conducted to test similar independent variables in predicting however negative the symptoms of schizophrenia. As

shown in Table 7, only formal years of education significantly predicted more negative symptoms; as education increased by one formal year, negative symptoms significantly declined by a standardized beta weight of almost 0.3.

Table 7. Simultaneous multiple regression analysis summary for age, gender, marital status, formal years of education and illness duration predicting negative symptoms (N=136)

Variables	B ^a	SEB ^b	B ^c	95% CI	
				Lower	Upper
Age	0.022	0.081	0.029	-0.13	0.18
Gender	1.499	1.208	0.1	-0.89	3.88
Marital status	0.633	1.533	0.035	-2.4	3.6
Formal years of education	-0.464	0.132	-0.298*	-0.72	-0.2
Illness duration	0.008	0.009	0.095	-0.01	0.02

* Highly significant

Table 8 shows that positive symptoms tended to be positively correlated with each other. The following positive symptoms show highly significant positive correlation with each other: Delusion (P1) with Conceptual Disorganization (P2), Grandiosity (P5) and Suspiciousness/persecution (P6); Conceptual disorganization (P2) with Delusion (P1), Hallucinatory Behavior (P3) and Suspiciousness/persecution (P6); Excitement (P4) with Grandiosity (P5); Grandiosity (P5) with Conceptual Disorganization (P2) and Grandiosity

(P5); Suspiciousness/Persecution (P6) with Delusion (P1), Conceptual Disorganization (P2) and Hallucinatory Behavior (P3).

Additionally, the following positive symptoms show significant positive correlation with each other: Delusion (P1) with Hostility (P7) and Hallucinatory Behavior (P3) with Grandiosity (P5).

Table 8. Correlation Coefficients of positive symptoms

		P1	P2	P3	P4	P5	P6	P7
P1	r ^a	1	0.34**	0.16	0.07	0.23**	0.61**	0.2*
	p ^b		< 0.001	0.06	0.3	0.006	< 0.001	0.02
P2	r ^a	0.34**	1	0.52**	0.09	0.16	0.33**	0.16
	p ^b	< 0.001		< 0.001	0.2	0.053	< 0.001	0.052
P3	r ^a	0.16	0.52**	1	0.01	0.19*	0.22**	0.11
	p ^b	0.06	< 0.001		0.9	0.03	0.009	0.2
P4	r ^a	0.07	0.09	0.01	1	0.35**	-0.02	0.03
	p ^b	0.3	0.2	0.9		< 0.001	0.8	0.7
P5	r ^a	0.23**	0.16	0.19*	0.35**	1	0.07	0.07
	p ^b	0.006	0.053	0.03	< 0.001		0.3	0.4
P6	r ^a	0.61**	0.33**	0.22**	-0.02	0.07	1	0.14
	p ^b	< 0.001	< 0.001	0.009	0.8	0.3		0.1
P7	r ^a	0.2*	0.16	0.11	0.03	0.07	0.14	1
	p ^b	0.02	0.052	0.2	0.7	0.4	0.1	

a Pearson correlation coefficient b p value

* Significant ** Highly significant

Table 9 indicates that negative symptoms, analogous to positive counterparts, have positive correlation with each other. For instance, the following negative symptoms display highly significant positive correlation with each other: Blunted Affect (N1), Poor Rapport (N3) and

Difficulty in Abstract Thinking (N5) with all other negative symptoms: Emotional Withdrawal (N2), Passive/Apathetic Social Withdrawal (N4) and Lack of Spontaneity and Flow of Conversation (N6) with all negative symptoms apart from Stereotyped Thinking

(N7), Stereotyped Thinking (N7) with Blunted affect (N1), and Poor Rapport (N3) with Difficulty in Abstract Thinking (N5). Additionally, Emotional Withdrawal (N2) and Passive/Apathetic Social Withdrawal (N4) significantly

correlated with Stereotyped Thinking (N7) in a positive direction. On the other hand, Lack of Spontaneity and Flow of Conversation (N6) did not correlate significantly with Stereotyped Thinking (N7).

Table 9. Correlation Coefficients of negative symptoms

		N1	N2	N3	N4	N5	N6	N7
N1	<i>r</i> ^a	1	0.37**	0.44**	0.3**	0.35**	0.41**	0.33**
	<i>p</i> ^b		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
N2	<i>r</i> ^a	0.37**	1	0.35**	0.57**	0.41**	0.3**	0.2*
	<i>p</i> ^b	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	0.014
N3	<i>r</i> ^a	0.44**	0.35**	1	0.4**	0.42**	0.5**	0.26**
	<i>p</i> ^b	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	0.002
N4	<i>r</i> ^a	0.3**	0.57**	0.4**	1	0.3**	0.3**	0.22*
	<i>p</i> ^b	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	0.011
N5	<i>r</i> ^a	0.35**	0.41**	0.42**	0.3**	1	0.27**	0.4**
	<i>p</i> ^b	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001
N6	<i>r</i> ^a	0.41**	0.3**	0.5**	0.3**	0.27**	1	0.15
	<i>p</i> ^b	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		0.08
N7	<i>r</i> ^a	0.33**	0.2*	0.26**	0.22*	0.4**	0.15	1
	<i>p</i> ^b	< 0.001	0.014	0.002	0.011	< 0.001	0.08	

^a Pearson Correlation Coefficient ^b *p* value
 * Significant ** Highly Significant

Table 10 shows that most of the positive symptoms correlate positively with negative symptoms of schizophrenia. For instance, the following positive symptoms show high significant correlations with some negative symptoms: Conceptual Disorganization (P2) with Blunted Affect (N1), Emotional Withdrawal (N2), Difficulty in Abstract Thinking (N5) and Stereotyped Thinking (N7), Hallucinatory Behavior (N3) with Blunted Affect (N1), Emotional Withdrawal (N2), Poor Rapport (N3) and Difficulty in Abstract Thinking (N5); Excitement (P4) with Lack of Spontaneity and Flow of

Conversation (N6); and Suspiciousness/Persecution (P6) with Emotional Withdrawal (N2).

Moreover, the following positive symptoms express significant positive correlation with some negative symptoms: Delusion (P1) with Blunted Affect (N1), Hallucinatory Behavior (P2) with Poor Rapport (N3) and Passive/Apathetic Social Withdrawal (N4), Hallucinatory Behavior (P3) with Passive/Apathetic Social Withdrawal (N4) and Stereotyped Thinking (N7), and finally Excitement (P4) with Blunted Affect (N1) and Stereotyped Thinking (N7). On the other hand, Grandiosity (P5) and Hostility (P7) did not correlate, significantly, with any negative symptoms.

Table 10. Correlation coefficients of positive vs. negative symptoms

		N1	N2	N3	N4	N5	N6	N7
P1	r ^a	0.2*	0.13	-0.002	0.1	0.1	-0.07	0.002
	p ^b	0.03	0.1	0.9	0.1	0.1	0.3	0.9
P2	r ^a	0.3**	0.25**	0.2*	0.21*	0.5**	0.04	0.4**
	p ^b	< 0.001	0.003	0.018	0.015	< 0.001	0.6	< 0.001
P3	r ^a	0.27**	0.3**	0.23**	0.17*	0.34**	0.15	0.2*
	p ^b	0.002	< 0.001	0.007	0.04	< 0.001	0.08	0.02
P4	r ^a	-0.17*	-0.07	-0.04	0.06	0.1	-0.26**	0.18*
	p ^b	0.04	0.4	0.6	0.4	0.2	0.002	0.03
P5	r ^a	0.06	-0.01	0.03	0.04	0.04	-0.05	0.13
	p ^b	0.5	0.8	0.6	0.6	0.6	0.5	0.1
P6	r ^a	0.1	0.22**	-0.03	0.13	0.03	0.02	0.08
	p ^b	0.2	0.008	0.7	0.1	0.6	0.8	0.3
P7	r ^a	-0.03	0.02	0.09	0.007	0.14	-0.03	-0.11
	p ^b	0.7	0.7	0.2	0.9	0.09	0.6	0.1

^aPearson correlation coefficient ^bp value

* Significant ** Highly significant

Discussion

To the investigators' best knowledge, despite numerous studies on schizophrenia signs and symptoms, there are few studies addressing these devastating psychopathologies of schizophrenia in Iraq. The current study is the first to investigate symptom phenomenology in those experiencing chronic schizophrenia in the Kurdistan region of Iraq.

A key aim of the current study was to evaluate symptoms of schizophrenia. We hypothesized that negative symptoms may be more prominent over time than positive symptoms; and, that there is no clear boundary in occurrences between positive and negative symptoms of schizophrenia.

N=136 patients with schizophrenia were assessed for the present study, which comprised n=88 (64.7%) men and n=48 (35.3%) women. The mean positive subscale was 15.95 ± 5.4 while the mean negative subscale was 23.2 ± 6.8, which suggests that the negative symptoms were significantly more evident, with a mean difference of 7.243 points on PANSS.

In a cross sectional investigation of 134 patients with schizophrenia, Kay *et al.* pooled data from an acute sample (Opler *et al.* 1984) with their present group compared PANSS scores in the acute (0-2 years), chronic

(3-10 years), and long term chronic stages (>10 years). They identified similar finding of negative symptoms prominent among the chronic sample of the studied patients.^{6,7}

Positive symptoms of schizophrenia

Current results showed a mean of 15.95 of the total positive symptoms on the PANSS rating scale. Conceptual Disorganization and Hostility were the most, and Grandiosity as well as Excitement the least scored positive symptoms in this investigation. Kay *et al.*, however, found Delusion and Conceptual Disorganization the commonest and Excitement and Hostility the least common positive symptoms.⁴ Several factors might explain these differences, despite similarities in Conceptual Disorganization and Excitement scores, between these two studies including, different cultures and educational backgrounds, stages of therapy, as well as duration of the illness. Botros *et al.*, though, found a 67% prevalence of Schneiderian First Rank Symptoms among 42 patients with schizophrenia in Egypt.⁸

Neither the demographic variables nor the illness duration were identified as significant predictors for any single positive symptoms on the multiple regression analysis. Botros *et al.* found relevant results regarding absence of influences of demographic data of the occurrence of Schneiderian First Rank Symptoms in

Egypt.⁸ Walker *et al.*, moreover, came with similar conclusions regarding gender when they assessed 882 patients with schizophrenia.⁹ However, Kianmanesh *et al.* found illness duration to be negatively correlated with the peak of their patients' positive symptoms.¹⁰

We cannot argue from conceptual point of view against our findings with regard to demographic variables. Furthermore, no particular study obviously highlighted any differences in positive symptoms profile over specific demographic variable.

Regarding the illness duration, one might predict a reduction in the positive symptoms over time, with or without treatment, as did Kianmanesh *et al.* We also found similar reduction over time in our sample. Yet, the reduction was not statistically significant. Such a statistical difference might be due to a relatively shorter duration of illness in our study compared to that of Kianmanesh *et al.* This is beside the possibilities of different stages of therapies between both studies.

The theme of Suspiciousness/Persecution was the commonest, and the theme of Erotomania the least common contents of delusion in the current sample. Azhar *et al.* and Philip *et al.* who studied 270 and 448 patients with schizophrenia, respectively, came with comparable conclusion.^{11,12} Nevertheless, De S *et al.* revealed back different rates of delusional themes.¹³

It may be that the differences in the cultural backgrounds of different studied populations directly influence the contents and themes of delusions. Both Suhail and Cochrane and Kim indicate that culture as well as the immediate environment of the patients are the key elements in determining the contents of delusion.^{14,15}

Regarding hallucination modalities, our findings were analogous to what is well known about schizophrenia. Auditory hallucination was the commonest and tactile one of the least common hallucinations in the current sample. In schizophrenia, auditory hallucination is clearly the most common type of hallucination. Visual hallucination comes next to auditory hallucination. Whereas olfactory and gustatory hallucinations tended to be reported by a small minority of patients, with olfactory hallucinations the more common of the two types.¹⁶ These findings are comparable to our own findings.

Negative symptoms of schizophrenia

The present study showed a total mean negative score of 23.2 on PANSS rating scale. Negative symptoms were more prevalent than positive symptoms, with a mean difference of 7.243 points on PANSS as stated earlier in

this discussion. Difficulty in Abstract Thinking was the most, and Stereotyped Thinking the least counted negative symptoms in our investigation. Moriarty *et al.* who investigated 205 geriatric patients with lifelong poor outcome schizophrenia found almost an identical conclusion.¹⁷ Kay *et al.*, however, found Passive/Apathetic Social Withdrawal the most, and Emotional Withdrawal the least common scored negative symptoms.⁴ There may be various factors playing a role in the differences found in the two studies; take for example cultural variance, treatment effects, education, duration of the illness, beside adopting different assessment tools .

None of the demographic variables, except education, were significant predictors for any single negative symptoms on the multiple regression analysis. Education was a significant predictor for many negative symptoms, and it was the only demographic variable to significantly forecast negative symptoms according to the multiple regression analysis. Our findings are supported by Gureje who investigated 147 in-patients with schizophrenia and found that formal year of education had a significant negative correlation with negative symptoms.¹⁸

Our study showed comparable results regarding illness duration with Kay and Singh,¹⁹ Liddle²⁰ and Mathai and Gopinath²¹ in which the negative symptoms were not related to the duration of illness. Ring *et al.*, nevertheless, reached a different conclusion regarding gender when finding negative symptoms twice as severe in men than women.²²

The last few decades have witnessed increased research on schizophrenia symptoms, which showed considerable evidence of more prevalent negative symptoms over time than positive symptoms. The current study reached similar conclusions that negative symptoms had a positive correlation with duration of the illness.^{4,6,17,23} Nevertheless, as stated earlier in our discussion, in the current studied sample duration of illness was longer than seven years, which may enlighten the predominance of negative over positive symptoms. This explanation is supported in findings from patients studied by Kay *et al.*⁶ and Opler *et al.*⁷

Correlations of symptoms with each other

The present study shows that positive symptoms tend to be positively correlates with one another. Excitement and Hostility each have significant correlation with only one positive symptom while others have correlations with

few or most of the symptoms. The findings have major similarities with Sheshai *et al.* finding who investigated 100 patients with chronic schizophrenia and found similar co-occurrence of positive symptoms with each another.²³

Moreover, all negative symptoms, except Lack of Spontaneity and Flow of Conversation and Stereotyped Thinking, had significant or highly significant positive correlations with all other negative symptoms. What was absent in our expectation was the overall positive correlation of both contrasting symptoms of schizophrenia. Our investigation showed a majority of positive symptoms to be significantly correlated with negative symptoms. Nevertheless, parallel to ours, Fention and McGlashan²⁴ and Sheshai *et al.*²³ who investigated 187 and 100 patients with schizophrenia, respectively, found similar conclusions. Crow, however, revealed no significant correlation between positive and negative symptoms, which are “at opposite ends of a continuum”. Crow dichotomized schizophrenia to two, contrasting as well as etiologically diverse, categorical types. He described them as two different disease processes, one biochemical, which leads to positive schizophrenia symptomatology, and the other structural, which leads to negative schizophrenia symptomatology.¹ These findings might indicate that different category symptoms have correlations with each other in different directions and they are on a continuum.

Limitations

Interpretation of findings from the present study should be considered in light of some limitations, such as the relatively modest sample size and the cross sectional nature of the study, which meant that tracking symptoms longitudinally was not possible. The present study also did not address correlations between symptoms to patients' current therapies and duration of their stay in hospital as well as lack of inter-rater reliability studies to ensure consistency among social workers, psychologists and medical staff who rated the patients.

References

1. Crow TJ. Molecular pathology of schizophrenia: more than one disease process? *Br Med J* 1980; 280(6207): 66-8. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1600263/pdf/brmedj00002-0006>. [Accessed 2015 July 24th].
2. Jackson KD, Hansen T, Dam H, Larsen EB, Gather U, Werge T. Reliability of clinical ICD-10 diagnoses among electroconvulsive therapy patients with chronic affective

- disorders. *Eur Psychiatry*. 2008;22(3). Available from:http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0213-6163200800-0300005. [Accessed 2015 Aug 9th].
3. World Health Organization. The ICD-10 classification of mental and behavioural disorders. Available form: <http://www.who.int/classifications/icd/en/> [Accessed 2015 Aug 8th].
4. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophr Bull*. 1987;13(2):261-76.
5. Kay SR, Opler LA, Lindenmayer JP. Reliability and validity of the positive and negative syndrome scale for schizophrenics. *J Psychiatr Res*. 1988;23(1):99-110. Available from: DOI: [http://dx.doi.org/10.1016/0165-1781\(88\)90038-8](http://dx.doi.org/10.1016/0165-1781(88)90038-8) [Accessed 2015 July 29th].
6. Kay SR, Opler LA, Fiszbein A. Significance of positive and negative syndromes in chronic schizophrenia. *BJP*. 1986; 149:439-48.
7. Opler LA, Kay SR, Rosado V, Lindenmayer JP. Positive and negative syndromes in chronic schizophrenic inpatients. *J Nerv Ment Dis*. 1984 Jun;172(6):317-25.
8. Botros MM, Atalla SF, El-Isalm MF. Schneiderian First Rank symptoms in a sample of schizophrenic patients in Egypt. *Int J Soc Psychiatry*. 2006 Sep;52(5):424-31.
9. Walker E, Bettes BA, Kain EL. Relationship of gender and marital status with symptomatology in psychotic patients. *J Abnorm Psychol*. 1985;94(1):42-50.
10. Kianmanesh S, Bakhshani NM, Sadjadi SA. Prevalence of positive and negative symptoms in schizophrenia patients with different cultural background. *JNAS*. 2013;3(5):593-6.
11. Azhar MZ, Varma SL, Hakim HR. Phenomenological differences of delusions between schizophrenic patients of two cultures of Malaysia. *Singapore Med J*. 1995;36:273-5.
12. Philip MR, West CL, Wang R. Erotomanic symptoms in 42 Chinese schizophrenic patients. *Br J Psychiatry*. 1996; 164(4):501-8.
13. De S, Bhatia T, Thomas P, Charkraborty S, Prasad S, Nagpol R, et al. Bizarre delusions: a qualitative study on Indian schizophrenic patients. *Indian J Psychol. Med* 2013; 35(3):268-72.
14. Suhail K, Cochrane R. Effect of culture and environment on the phenomenology of delusions and hallucinations. *Int J Soc Psychiatry*. 2002;48(2):126-38. Available from: PMID: 12182508 [PubMed - indexed for MEDLINE]. [Accessed 2015 Aug 4th].
15. Kim K. Delusions and hallucinations in East Asians with Schizophrenia. *WCPRR* 2006;1(1):37-42.
16. Sadock BJ, Sadock VA. Kaplan and Sadock's synopsis of psychiatry, 9th ed. Philadelphia: Lippincott Williams & Wilkins;2003:492.
17. Moriarty PJ, Lieber D, Bennett A, White L, Parrella M, Harvey PD et al. Gender differences in poor outcome patients with lifelong schizophrenia. *Schizophr Bull*. 2001; 27(1):103-13.
18. Gureje O. Correlates of positive and negative schizophrenia syndromes in Nigerian patients. *Br J Psychiatry*. 1989;155: 628-32.
19. Kay SR, Singh MM. The Positive-Negative Distinction in Drug-Free Schizophrenic Patients Stability, Response to Neuroleptics, and Prognostic Significance. *Arch Gen Psychiatry*. 1989;46(8):711-18.

20. Liddle PF. The symptoms of chronic schizophrenia. A re-examination of the positive-negative dichotomy. Br J Psychiatry. 1987;151(2):145-51. Available from: DOI: 10.1192/bjp.151.2.145 [Accessed 2015 Aug 11th].
21. Mathai PJ, Gopinath PS. Deficits of chronic schizophrenia in relation to long-term hospitalization. Br J Psychiatry. 1986;148(5):509-16.
22. Ring N, Tantam D, Montague L, Black D, Morris J. Gender differences in the incidence of definite schizophrenia and atypical psychosis-focus on negative symptoms of schizophrenia. Acta Psychiatr Scand. 1991;84:489-96.
23. Sheshai A, Rashed S, Saadany, M. Positive and Negative Symptoms in Schizophrenia' Egypt J Psychiatry. 1994;17: 33-40. Available from: <http://psychiatry-research-eg.com/texts/EJP/aha1a4>. [Accessed 2015 July 24th].
24. Fenton WS, McGlashan TH. Testing symptoms for assessment of negative symptoms in schizophrenia. Arch Gen Psychiatry. 1992;49(3):179-84.

المخلص

الأهداف: تهدف هذه الدراسة الى تقييم الأعراض الإيجابية والسلبية لدى مرضى الفصام، وتقييم ترابط هذه الأعراض مع بعضها البعض وكذلك مع بياناتهم الشخصية.

طرق البحث: تمت إجراء دراسة مقطعية لتقييم الأعراض الإيجابية والسلبية لدى مرضى الفصام في ثلاثة مصحات نفسية في مدينتي سلیمانانية وأربيل بين فترة نيسان إلى كانون الثاني ٢٠١٥. تمت الاستعانة بمقياس الأعراض الإيجابية والسلبية لتقييم الأعراض وقائمة تدقيق التصنيف الدولي العاشر للأمراض. **النتائج:** كانت الأعراض السلبية أكثر وضوحاً من الأعراض الإيجابية بمعدل ٧,٢٤٣ فرق على مقياس الأعراض الإيجابية والسلبية. كانت الأوهام والهلاوس ظاهراً لدى أقل من ٤٣% و ٤٦% عند المرضى على التوالي. لم يكن هنالك تأثيراً واضحاً للبيانات الشخصية للمرضى، عدا المستوى التعليمي، على ظهور الأعراض. كان واضحاً أن تحسن المستوى التعليمي يؤدي إلى التقليل من ظهور الأعراض السلبية. أظهرت الدراسة نمط ترابطي لظهور كل من الأعراض الإيجابية والسلبية مع بعضها البعض. **الاستنتاج:** تتوجه أعراض الفصام للظهور بنمط استمراري ترابطي. الأعراض السلبية هي أكثر شيوعاً. ليس هنالك تأثير واضح للبيانات الشخصية للمرضى، عدا المستوى التعليمي، على ظهور أعراض اضطراب الفصام.

Corresponding author

Dr Twana Abdulrahman Rahim

Department of Medicine, School of Medicine, faculty of Medical Sciences, University of Sulaimani, Downtown Campus, 27 New St, Zone 209, Sulaimani - Kurdistan Region, Iraq
Email: rahim.twana@gmail.com

Authors

Dr Twana Abdulrahman Rahim

Assistant Professor of Psychiatry

School of Medicine, Faculty of Medical Sciences, University of Sulaimani

Department of Medicine, School of Medicine, faculty of Medical Sciences, University of Sulaimani, Downtown Campus, 27 New St, Zone 209, Sulaimani - Kurdistan Region, Iraq

Dr Hemin Fatih Hama Kareem

Psychiatric Registrar

Sulaimani Mental Health Center

Sulaimani Teaching Hospital, Sulaimani DOH, 27 New St, Zone 209, Sulaimani - Kurdistan Region, Iraq

Prevalence and Severity of Somatic Symptoms, Depression and Anxiety among Medical Students at the Arabian Gulf University: Comparison between Second and Sixth Year

Ammar Mohamed Abdelaziz, Khalid Talal Alotaibi, Jarah Hamad Alhurayyis, Turkey Abdullah Alqahtani, Aamer Meshari Alghamlas, Haifa Mohammed Algahtani, Haitham Ali Jahrami

نسبه انتشار وشدة اعراض الجسدية والاكتئاب والقلق لدى طلاب الطب في جامعة الخليج العربي: دراسة مقارنة بين طلبة السنة الثانية والسنة السادسة

عمار محمد عبد العزيز، خالد طلال العتيبي، جراح حمد الحريص، تركي عبد الله القحطاني، عامر مشاري الغملاس، هيفاء محمد القحطاني، هيثم علي جهرمي،

Abstract

Objective: The current study assessed the prevalence and severity of somatic symptoms, depression and anxiety among students at the Arabian Gulf University. Comparison of symptoms was between Year 2 and Year 6 medical students. **Methods:** We conducted a cross-sectional study using a convenient sample size of (N=160) where n=80 from Year 2 and n=80 from Year 6. Assessment involved a socio-demographic and three self-report questionnaires. The Patient Health Questionnaire-15 (PHQ-15) for detection of somatic symptoms, Patient Health Questionnaire-9 (PHQ-9) for detection of depression symptoms and the Generalized Anxiety Disorder (GAD-7) to detect generalized anxiety disorder. **Results:** Somatic symptoms were the highest among medical students with a prevalence of 46%. Anxiety symptoms came second with a prevalence of 39.4%. The levels of moderate to severe depression symptoms were the lowest with a prevalence of 18.8%. No statistically significant differences were obtained between groups. However, Year 2 students reported higher levels of somatic symptoms while Year 6 students reported higher anxiety; depression symptom levels were identical in both years. Female students reported higher levels of all three symptoms compared to males ($p < 0.05$). **Conclusion:** Medical students had moderate levels of somatic and anxiety symptoms and low levels of depression symptoms.

Key Words: Depression, anxiety, somatic symptoms, medical students, Arab

Conflicts of Interest statement: None

Introduction

Life as a medical student imposes a certain lifestyle on students that is considered one of the most stressful of all educational systems.¹ Medical schools present many challenges and stressors as well as high expectations that can affect students' health, wellbeing and quality of life. The poor quality of life that some medical students experience may result in mental health challenges that can affect their productivity.³ As it stands, the medical community gives low priority to such mental illnesses, and it even creates barriers to prevent medical students and doctors from seeking help, including discrimination in medical licensing, hospital privileges and professional advancement.⁴

Research indicates that the presence of somatic symptoms, anxiety and depression is quite common in conflicting or highly demanding situations, such as medical training.⁵ No doubt some level of anxiety can be beneficial for medical students; however, from a certain

degree onward, it can be counterproductive causing blocked thinking and behavioral problems such as smoking, alcohol and drug misuse.⁶ The research literature highlights how stress from assessment and examinations, exposure to learning demands and the day-to-day social interaction with new colleagues and patients are the most anxiogenic factors. The prevalence of anxiety symptoms in medical students is high compared with the general population.⁵ Depressive and somatic symptoms are also common among medical students. The presence of depressive and somatic symptoms is associated with demand for perfectionism in medical students and with the constant stress to which this population is subjected.⁷

Somatic, depression and anxiety symptoms appear to be significant issues for medical students. A long-term aim of the current research is to highlight the importance of ongoing mental health assessment, treatment and education for medical students.

The specific aim is to estimate the prevalence and severity of somatic, anxiety and depression symptoms among medical students in the Arabian Gulf University, Kingdom of Bahrain. The present study also aimed to compare the difference between prevalence of the above mentioned symptoms between two different stages of medical education. We postulate that Year 6 medical students will show higher levels of anxiety and depression symptoms because this is when the final exam is scheduled and students are usually in the process of deciding on their career paths. We also predict that women will report higher levels of depression, anxiety and somatic symptoms because they are often better able to express their emotions than men.

Methods

The present study is a cross-sectional design aimed to assess the prevalence and severity of somatic, depression and anxiety symptoms among a sample of medical students attending the Arabian Gulf University in the Kingdom of Bahrain. Differences in symptom presentation between the medical sciences phase (Year 2) and clinical clerkship phase (Year 6) are also addresses.

The present study took place in the College of Medicine and Medical Sciences at the Arabian Gulf University. The university was established in 1998 by the General Council of Ministers of Education in the Gulf Cooperation Council (GCC) Countries. The university admits an average of 150 students annually from across the GCC. Within the student body, women outnumber men with the ratio currently being 4:1. The college of medicine and medical sciences follows a problem-based learning curriculum where teaching and learning are carried out through an integrated organ-system based process with the faculty members acting as facilitators to small groups of students.

For the present study, a cross-sectional survey was distributed from December 2015 to January 2016 using self-administered questionnaires. The sampling technique involved non-randomized convenient sampling for distributing the questionnaire to the individuals participating.

The inclusion criteria:

1. Medical students attending Arabian Gulf University;
2. Either gender included;
3. Year 2 or Year 6 medical students;
4. Willing to participate in the study.

The exclusion criteria:

1. Students with pre-existing medical or psychiatric condition;
2. Incomplete surveys were excluded.

The questionnaires were a short, basic socio-demographic and three diagnostic instruments. The Patient Health Questionnaire-15 (PHQ-15) is a self-administered instrument developed for detection of somatic symptoms that consists of a list of 15 somatic symptoms.⁸ The 15 symptoms were each scored on a three point Likert scale (Not bothered at all = 0, Bothered a little = 1, Bothered a lot = 2). The PHQ-15 overall score interpretation is as follows: 0-4 minimal somatic symptoms, 5-9 low somatic symptoms, 10-14 medium somatic symptoms, 15 or more high somatic symptoms. Increasing scores on the PHQ-15 are strongly associated with functional impairment, disability and health care use.⁹

The Patient Health Questionnaire-9 (PHQ-9) assesses depressive symptoms and scores each of the nine DSM-IV criteria on a four-point Likert scale¹⁰ (0=not at all to 3=nearly every day). It is not a screening tool for depression, but is used to monitor the presence and severity of depression. PHQ-9 classification of symptoms is scored as 5-9 minimal symptoms, 10-14 minor depression, 15-19 moderate major depression, >20 severe major depression.

The Generalized Anxiety Disorder-7 (GAD-7) is a self-reported instrument for screening and severity measuring of generalized anxiety disorder (GAD).¹¹ The instrument has seven items, which measure severity of various signs of anxiety on a four-point Likert scale (0=not at all to 3=nearly every day). GAD-7 scoring indicates that 0-2 none, 3-6 probable anxiety disorder.

The validity and test re-test reliability of the PHQ-15, PHQ-9 and GAD-7 were established in clinical settings.^{9, 10, 12, 11} The three standardized instruments also demonstrated high sensitivity and specificity. The original English language versions for the three research instruments were used to maintain and preserve the psychometric and statistical properties of the tool. No cross-cultural adaptations were needed and there was no need to translate them.

The study was powered using a sample of 160 subjects. Sample size calculations using an alpha of 0.05 and 80% power indicated that a minimum of 100 participants (n=50 for the medical sciences phase and n=50 for the clerkship year phase) to determine a difference in the prevalence proportion of at least 20% as an effect size for anxiety or depression.

Research approval was obtained from the Research Committee, Arabian Gulf University in the Kingdom of Bahrain. Participation was voluntary and no participant was enforced to answer the questionnaire. No names, identification numbers or addresses were taken during the data collection to preserve anonymity and confidentiality.

N=160 students were enrolled in the current study with n=80 from Year 2 and n=80 from Year 6. Gender distribution shows that 66 (41.3%) were men and 94 (58.8%) were women. The students' ages ranged between 18-26 years with an arithmetic mean 21.5 year, a standard error of the mean of 0.18 years (95%CI 21.1 – 21.8). See Table 1. Only three demographics were collected to maintain the anonymity of participants.

Results

Table 1. Sociodemographic characteristics of the medical students (N=160)

Educational Year	No.	%
Year 2	80	50
Year 6	80	50
Gender	No.	%
Male	66	41.3
Female	94	58.8
Age	Mean	Std. dev.
	21.5	2.3

Table 2. Prevalence and severity of somatic symptoms of the medical students using the PHQ-15 (N=160)

	Minimal somatic symptom severity No. (%)	Low somatic symptom severity No. (%)	Medium somatic symptom severity No. (%)	High somatic symptom severity No. (%)
Year 2	12 (15%)	25 (31.3%)	24 (30%)	19 (23.8)
Year 6	18 (22.5%)	31 (38.8%)	17 (21.3%)	14 (17.5%)
Total	30 (18.8%)	56 (35%)	41 (25.6%)	33 (20.6%)

Using the PHQ-15, we estimated that 46% had medium to severe somatic symptoms. The prevalence of medium to severe somatic symptoms was higher among Year 2 students (53%) compared to Year 6 students (39%). Differences between Year 2 and 6 were not statistically

significant. However, statistical analysis showed a significant difference between men and women as regards somatic symptoms with women reporting higher levels somatic symptoms compared to men. See Table 2.

Table 3. Prevalence and severity of depression symptoms of the medical students using the PHQ-9 (N=160)

	None No. (%)	Minimum symptoms No. (%)	Minor depression (Dysthymia) No. (%)	Moderate, major depression No. (%)	Severe, major depression No (%)
Year 2	27 (32.5%)	27 (33.8%)	11 (13.8%)	9 (11.3%)	6 (7.5%)
Year 6	28 (35%)	24 (30%)	13 (16.3%)	9 (11.3%)	6 (7.5%)
Total	55 (34.4%)	51 (31.9%)	24 (15%)	18 (11.3%)	12 (7.5%)

Looking at the prevalence of depression symptoms using the PHQ-9, we found that 18.8% of medical students showed signs and symptoms indicating moderate to severe depression (see Table 3). Interestingly, the prevalence and severity of depressive symptoms was identical between Year 2 and Year 6. Thus, there were no significant differences between them. Nonetheless,

comparison between rates of depression in men and women showed a statistically significant difference, with higher rates found in women.

Table 4. Prevalence and severity of anxiety symptoms of the medical students using the GAD-7 (n=160)

	No symptoms No. (%)	Probable anxiety disorder No. (%)
Year 2	51 (63.8%)	29 (36.3%)
Year 6	46 (57.5%)	34 (42.5%)
Total	97 (60.6%)	63 (39.4%)

The overall rate of students having probable anxiety disorder was 39.4% using the GAD-7. The prevalence of anxiety disorders was higher in Year 6 compared with Year 2 (see Table 4).

The difference in the prevalence rates between students of either gender was significant with women having higher prevalence rates of anxiety disorders than men.

Table 5. Prevalence of anxiety (panic) attacks in medical students (N=160)

	No attacks No. (%)	Yes No. (%)
Year 2	49 (61.3%)	31 (38.8%)
Year 6	57 (71.3%)	23 (28.8%)
Total	106 (66.3%)	54 (33.8%)

Approximately 34% of students experienced anxiety (panic) attacks, 38.8% from Year 2, and 28.8% from Year 6. Women reported more anxiety attacks than men and the difference was statistically significant.

Discussion

Our study investigated the prevalence and severity of somatic, depression and anxiety symptoms among medical students attending the Arabian Gulf University in Bahrain. Somatic symptoms were the most prevalent symptoms (46%) and depression symptoms (18.8%) were the least. Anxiety symptoms were also high with a prevalence of 39.4% and 33.8% prevalence of anxiety (panic) attacks.

Past studies have rarely focused on somatic symptoms among medical students. Our study found that somatic symptoms are the most prevalent symptoms in the construction of the psychological profile of medical students. Somatic symptoms are a constellation of symptoms characterized by recurring, multiple and clinically significant complaints about physical symptoms. In our study, the main somatic symptoms were: insomnia, fatigue, headaches, back pain, generalized pain and menstrual cramps.

Results showed a slightly higher prevalence of moderate to severe depression symptoms (18.8%) when compared with studies conducted in Nigeria (7.6%),¹³ Oman (11.4%),¹⁴ Sweden (12.9%),¹⁵ China (13.5%),¹⁶ US (14.3%),¹⁷ and New Zealand (16.9%).¹⁸ Other studies

have obtained higher prevalence of depression symptoms, e.g. two studies in India: Gujarat (26.6%),¹⁹ New Delhi (29.1),²⁰ and Latvia (34%).²¹ One study in the Kingdom of Saudi Arabia found the prevalence of depression was 43%, but dropped to 30% after examinations.²² The studies in Nigeria, Oman, New Delhi, New Zealand used the same research instrument - the PHQ-9. A study conducted in Bahrain in 2011 showed an identical prevalence rate of depression symptoms (18.9%) for Year 6 students, but higher rate (31.9%) for Year 1 students; however, the Hospital Anxiety and Depression Scale (HADS) was used.²³

Regarding the prevalence rate of anxiety symptoms, we found a 39.4% rate in our study compared to 13.7% in one from New Zealand.¹⁸ Year 2 medical students had a prevalence rate of 36.3% and Year 6 medical students had a higher prevalence rate of anxiety symptoms (42.5%). A study of medical students attending the Arabian Gulf University in Bahrain found a similar pattern: 33.9% for Year 1 and 55.07% for Year 6 students.²³ Findings suggest that anxiety symptoms are greater in the higher years of medical education. The results from our study however did not reach a difference that was of any statistical significance.

Our study showed a statistically significant difference in the prevalence and severity of somatic, depression and anxiety related to gender. These results were consistent with studies conducted in New Zealand,¹⁸ Saudi Arabia²² and Latvia.²¹ A systematic review of depression, anxiety and other indicators of psychological distress among medical students in Canada and the US also concluded

that women had higher prevalence rates of somatic, depression and anxiety compared to men.²⁴

Several studies have concluded that female students are more likely to experience depression,^{15,25} and that female medical doctors tend to have higher suicide rates than their male colleagues.²⁶

Comparison between Year 2 and Year 6 demonstrated no statistically significant differences in the prevalence and severity of somatic, depression, and anxiety. However, somatic symptoms were lower in Year 6 (38.8%) compared to Year 2 (53.8%) for medium and high somatic symptoms. Depression symptoms were identical for Year 2 and Year 6 with a prevalence of 18.8% for moderate and severe depression. Finally, anxiety symptoms were higher in Year 6 (42.5%) compared to Year 2 (36.3%).

Conclusion

When comparing our results with previous studies, e.g. Arabian Gulf University in Bahrain, our results support the finding that the magnitude of anxiety symptoms in Year 6 reflected higher prevalence rates when compared to Year 1.²³ Nonetheless, our study did not find similar results for depression symptoms.

Limitations

The current study had several limitations. The sample included medical students from Years 2 and 6 only, which may not have allowed for direct comparison with other medical students in other years. The inherent bias in convenience sampling risked the sample not being representative of the population studied. Moreover, the current study was conducted in one medical school in Bahrain, which limits generalizability. The use of self-report questionnaires might have introduced recall bias regarding events or experiences or symptoms from the past. Finally, the data collection tools were not standardized for Arabian Gulf citizens. The validity and reliability of these tools in other communities is not fully transferrable to the present study population.

The current study also had several strengths. The use of a validated survey instrument allowed for comparison and collateral data collection between comparable groups, i.e. Years 2 and 6. The use of three instruments also made for a more robust methodology. Further, the study was conducted with a multi-ethnic cohort of students from the Gulf Cooperation Council, which is a union consisting of all Arab states in the Arabian Gulf. Its member states are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates; however, to protect student anonymity, nationality was not reported in the analyses.

There are several implications and recommendations from the study. First, we propose that medical schools have regular schedules to reduce unnecessary course stress and account for the busy schedules of medical students. This could be achieved by involving all students or by using student satisfaction surveys. Second, counselling and support services could be expanded. Third, only three risk factors were considered in the present study. For future research, we recommend including more risk factors so results can have a larger impact. Lifestyle-related risk factors would be of great importance for future research to consider. Fourth, time-management and communication workshops could be conducted for students, such as 'coping skills training'. Finally, the use of problem-based learning processes could allow free time for self-directed learning and reflection as well as building a balanced work-play lifestyle. We conclude that the medical students in our study reported moderate levels of somatic and anxiety symptoms, but low levels of depression.

References

1. Bassols AM, Okabayashi LS, Silva AB da, et al. First- and last-year medical students: is there a difference in the prevalence and intensity of anxiety and depressive symptoms? *Rev Bras Psiquiatr São Paulo Braz.* 1999 2014;36(3):233-40.
2. Karaoglu N, Seker M. Anxiety and depression in medical students related to desire for and expectations from a medical career. *West Indian Med J.* 2010;59(2):196-202.
3. Ibrahim N, Al-Kharboush D, El-Khatib L, Al-Habib A, Asali D. Prevalence and Predictors of Anxiety and Depression among Female Medical Students in King Abdulaziz University, Jeddah, Saudi Arabia. *Iran J Public Health.* 2013;42(7):726-36.
4. Center C, Davis M, Detre T, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA.* 2003; 289(23):3161-6.
5. Quince TA, Wood DF, Parker RA, Benson J. Prevalence and persistence of depression among undergraduate medical students: a longitudinal study at one UK medical school. *BMJ Open.* 2012;2(4):1-8
6. Houwink AP, Kurup AN, Kollars JP, Kral Kollars CA, Carmichael SW, Pawlina W. Help of third-year medical students decreases first-year medical students' negative psychological reactions on the first day of gross anatomy dissection. *Clin Anat.* 2004;17(4):328-33.
7. Amaral GF do, Gomide LM de P, Batista M de P, et al. Depressive symptoms in medical students of Universidade Federal de Goiás: a prevalence study. *Rev Psiquiatr Rio Gd Sul.* 2008;30(2):124-30.
8. Spitzer RL, Kroenke K, Williams JW, and the Patient Health Questionnaire Primary Care Study Group. Validation and utility of a self-report version of prime-md: The PHQ primary care study. *JAMA.* 1999; 282(18):1737-44.

9. Kroenke K. Somatoform disorders and recent diagnostic controversies. *Psychiatr Clin North Am.* 2007; 30(4):593-619.
10. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med.* 2001;16(9):606-13.
11. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med.* 2006; 166(10):1092-7.
12. Yoon S, Lee Y, Han C, et al. Usefulness of the Patient Health Questionnaire-9 for Korean medical students. *Acad Psychiatry J Am Assoc Dir Psychiatr Resid Train Assoc Acad Psychiatry.* 2014;38(6):661-7.
13. Adewuya AO, Ola BA, Afolabi OO. Validity of the patient health questionnaire (PHQ-9) as a screening tool for depression amongst Nigerian university students. *J Affect Disord.* 2006;96(1-2):89-93.
14. Al-Ghafri G, Al-Sinawi H, Al-Muniri A, et al. Prevalence of depressive symptoms as elicited by Patient Health Questionnaire (PHQ-9) among medical trainees in Oman. *Asian J Psychiatry.* 2014;8:59-62.
15. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: a cross-sectional study. *Med Educ.* 2005;39(6):594-604.
16. Sobowale K, Zhou N, Fan J, Liu N, Sherer R. Depression and suicidal ideation in medical students in China: a call for wellness curricula. *Int J Med Educ.* 2014;5:31-6.
17. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. *JAMA.* 2010;304(11):1181-90.
18. Samaranayake CB, Fernando AT. Satisfaction with life and depression among medical students in Auckland, New Zealand. *N Z Med J.* 2011;124(1341):12-7.
19. Vankar J, Prabhakaran A, Sharma H. Depression and stigma in medical students at a private medical college. *Indian J Psychol Med.* 2014;36(3):246.
20. Sidana S, Kishore J, Ghosh V, Gulati D, Jiloha R, Anand T. Prevalence of depression in students of a medical college in New Delhi: A cross-sectional study. *Australas Med J.* 2012;5(5):247-50.
21. Pikaļevs I. Prevalence of depression symptoms in 6th year medical students. [Internet]. Available from: http://www.rsu.lv/eng/images/Documents/isc_2015_abstracts/depression_symptoms_medical_students.pdf
22. Kulsoom B, Afsar NA. Stress, anxiety, and depression among medical students in a multiethnic setting. *Neuropsychiatr Dis Treat.* 2015;11:1713-22.
23. Ali HM, Attar DM, Al-Abdulwahid F, et al. Comparison between the first and sixth year medical students in the arabian gulf university of bahrain regarding anxiety and depression. <http://www.sciencedomain.org/abstract.php?iid=371&id=29&aid=3313> [Internet] 2014 [cited 2016 Feb 23]; Available from: <http://imsear.hellis.org/handle/123456789/152687>
24. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med J Assoc Am Med Coll.* 2006;81(4):354-73.
25. Alvi T, Assad F, Ramzan M, Khan FA. Depression, anxiety and their associated factors among medical students. *J Coll Physicians Surg—Pak. JCPSP* 2010; 20(2):122-6.
26. Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry.* 2004;161(12):2295-302.

المخلص

الاهداف: تهدف هذه الدراسة إلى معرفة نسبة انتشار وشدة أعراض الجسدية والاكتئاب والقلق لدى طلاب الطب في جامعة الخليج العربي ومقارنة هذه نسب الانتشار والشدة بين طلبة السنة الثانية والسنة السادسة. **طريقة البحث:** لقد تم الاعتماد على دراسة مقطعية تشمل عينة مكونة من 160 طالباً. شملت العينة 80 طالباً من السنة الثانية و80 طالباً من السنة السادسة. تم استخدام استمارة للبيانات الديموغرافية بالإضافة إلى ثلاثة أدوات قياس علمية. الأدوات المستخدمة استبيان صحة المريض-15 (PHQ-15) لقياس أعراض الجسدية واستبيان صحة المريض-9 (PHQ-9) لقياس الاكتئاب ومقياس اضطراب القلق العام (GAD-7) لقياس القلق. **النتائج:** لقد توصلت الدراسة إلى أن أعراض الجسدية كانت نسبتها الأعلى بنسبة 46% بينما جاءت أعراض القلق في المركز الثاني بنسبة وصلت إلى 39.4%، وفي المركز الثالث جاءت أعراض الاكتئاب بنسبة 18.8%. والجدير بالذكر بأنه لم يتم ملاحظة أي فروقات ذات دلالة إحصائية بين طلاب السنة الثانية والسنة السادسة، بالرغم من ذلك فإن طلاب السنة الثانية أظهروا نسبة أكبر من أعراض الجسدية، بينما أظهر طلاب السنة السادسة نسبة أعلى من أعراض القلق. وقد أظهرت النتائج تطابقاً في معدلات أعراض الاكتئاب بين السنتين. كما أشارت النتائج بأن النساء كانت لديهن أعراض أكثر من الرجال في كل الأمراض المذكورة وقد كانت هذه النتائج ذات دلالة إحصائية. **الخاتمة:** لقد أوضحت نتائج البحث بأن طلاب الطب في جامعة الخليج العربي أظهروا معدلات معتدلة من أعراض الجسدية والقلق ولكنهم أظهروا مستويات منخفضة من أعراض الاكتئاب.

Corresponding author

Dr Haitham Ali Jahrami

Hjahrami@health.gov.bh

Authors

Dr Ammar Mohamed Abdelaziz

College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671

Dr Khalid Talal Alotaibi

College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671

Dr Jarah Hamad Alhurayyis

College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671

Dr Turkey Abdullah Alqahtani

College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671

Dr Aamer Meshari Alghamlas

College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
Tel: +973 17 239 605, P.O. Box 26671

Dr Haifa Mohammed Algahtani

Chairperson, Department of Psychiatry College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671

Dr Haitham Ali Jahrami, PhD

Assistant Professor, Department of Psychiatry College of Medicine and Medical Sciences, Arabian Gulf University - Kingdom of Bahrain
P.O. Box 26671
Chief, Rehabilitation Services Psychiatric Hospital, Ministry of Health, Kingdom of Bahrain
P.O. Box 5128
Hjahrami@health.gov.bh

Prevalence of Eating Disorders among Students at the University of Jordan

Basma F. Kilani

نسبة انتشار اضطرابات الاكل لدى طلبة الجامعة الأردنية

بسمة ف الكيلاني

Abstract

Objectives: The current study aimed to investigate the prevalence of psychological factors for developing Eating Disorders (EDs) among students of the University of Jordan and its relationship to gender, year of study, and family residence. **Methods:** The 40-item Eating Attitude Test - Jordanian Version (EAT-40-JOV) was applied to N=4565 participants, ages 18 to 22 years, from the 18 colleges that comprise the university. Test-retest reliability of the scale was 0.85 and internal consistency via Cronbach's Alpha was 0.94. The scale validity was measured by construct validity, where loading of items on extracted factors agreed with the original version. **Results:** Findings indicated that total prevalence of students at risk for developing and eating disorder was 14.2% (n=178). The total prevalence of EDs among women and men was 15.7% and 10.6%, respectively. Results suggest that students from urban areas were at significantly higher risk of developing an eating disorder than students from rural areas. **Conclusion:** The current study raises awareness about the importance of screening young people in Jordan for EDs; however, further research is needed. The EAT-40-JOV as a possible screening tool must be considered alongside observations that certain statements within it may lack cultural validity.

Keywords: Eating disorders, university students, residence, factor analysis, gender

Declaration of interest: None

Introduction

Eating Disorders (EDs) are serious mental health conditions related to persistent eating behaviors that negatively impact the person's health, emotions and ability to function in important aspects of life. EDs involve deforming of the body through over or under intake of food; it can harm the heart, digestive system, bones, and teeth and mouth, and lead to other diseases. A number of risk factors have been associated with the development of EDs. These factors are represented in biological vulnerability, psychological predisposition, family situations, and socio-cultural factors and all contribute to the risk of developing an ED¹.

There are four types of EDs: (1) Anorexia Nervosa (AN), (2) Bulimia Nervosa (BN), (3) Eating Disorders Not Otherwise Specified (EDNOS), and (4) Binge Eating Disorder (BED).² All were introduced fairly recently into the medical nosology. Anorexia nervosa, as a type of eating disorder, was first recognized as a mental disorder in the late 19th Century. Bulimia nervosa was considered a variant of AN in the 1970s and was introduced as an independent disorder in the 1980s.³

This area of study has a short history in research with theorists explaining the etiology of eating disorders through a number of theories. Firstly, the biological

theory describes EDs as being due to, either a lack of appetite as is seen in people with anorexia nervosa or an out of control appetite as in bulimia nervosa.¹ Proponents of the biological viewpoint have identified evidence of abnormalities in the serotonergic functioning of individuals who possess the symptoms of bulimia nervosa.¹ Another theory describes the neuro-endocrine factor, which suggests that a hormonal aberration triggers the disorder or that it can be mediated by stress and other environmental factors that somehow disrupt hormonal functioning which, in turn, affects eating.⁴

Eating disorders can also be explained through developmental theory, which emphasizes the importance of Social Learning Theory,⁵ whereby children learn by imitating others; in short they observe, then remember, and then reproduce at an appropriate time the observed behavior.⁵ However, the Multivariate Etiology Model indicates that there are numerous theoretical models that explain how the risk factors for EDs work together to enhance the development of eating pathology.³ Furthermore, cognitive factors suggest that individuals afflicted with EDs feature several cognitive aberrations, including obsessive thoughts, inaccurate judgments, and rigid thinking patterns.⁴

Another theory, the Familial Influences Theory, suggests that families play a role in encouraging EDs at various times; for example, praising the slenderness and self control of the AN patient may be reinforce her/his eating patterns.⁴ Lastly, the Socio-Cultural Contributions Theory implies that EDs do not occur uniformly in all cultures. Obsession with slimness is more likely in cultures, in which food is abundant, while in cultures of scarcity, the ideal body shape is much more likely to be fuller.⁶

The current study investigated the prevalence of factors associated with EDs as measured by the 40-item Eating Attitude Test - Jordanian Version (EAT-40-JOV) among a random sample of men and women studying as undergraduates at the University of Jordan who were between the ages of 18-22 years. The sample comprised approximately 3% of the university's student population and the differences in prevalence took into account the gender, year of study and the family residence.

Methods

The study population consisted of all undergraduate students enrolled in all of the faculties at the University of Jordan during the second semester of the academic year 2007/2008. At the time, the total population was 31,355 students. A representative sample of 3% of the student population was chosen randomly and resulted in a sample size of N=1405 from which n=148 were excluded due to having incomplete information in their response questionnaires. The final sample was N=1257 students (n=871 women, n=386 men).

Demographic information included the student's name, weight, height, year of study, family residence, and size of family; parental status, education, and profession were also sought from the 1257 students selected from the university's 18 colleges.

The Eating Attitudes Test (EAT-40)¹⁴

This measure was used as the main assessment tool for the current study. It is one of the most commonly used measures in the detection of EDs and was developed by Garner and Garfinkel.¹⁴ It was translated into Arabic and adapted to the national culture of Jordan by Shurique and Abdulhamid.¹⁵ In the present study, reliability and factorial validity of the Jordanian version (EAT-40-JOV) were tested for the sample population. The 40-item, seven factor model assesses: (1) Dieting, (2) Body Image for Thinness, (3) Clandestine Eating, (4) Food Preoccupation, (5) Slow Eating, (6) Perceived Social Pressure to Gain Weight, and (7) Vomiting and Laxative. Factor analysis results found all seven factors to be valid for the Jordanian sample since the items were evenly distributed as shown Table 1. This was evaluated with 30 students who were chosen randomly from the study population in a three-week interval.

The validity of the EAT-40-JOV was measured by matching the extracted significant Eigenvalues of extracted factors, with the original ones; there was agreement between the two versions.

All completed EAT-40-JOV questionnaires were individually scored and calculated. This was done by summing up the scores (1-3) on each item of the Eat-40-JV (Total Score); a sub-score on each factor was calculated. According to the score obtained, the student was allocated to one of two groups: (1) the high risk group, which comprised those at 75% above the cutoff point) or (2) the low risk group comprised of those at 75% below the cutoff point) on each factor according to the criterion suggested in the English version of EAT-40.¹⁴

Table 1. Internal consistency (Cronbach's Alpha) and test-retest for the Eat-40-JV and its factors

Factors	Number of Items	Internal Consistency (Cronbach's Alpha)	Test-Retest Correlation Coefficient
Dieting	10	0.84	0.89
Body Image for Thinness	8	0.89	0.92
Clandestine Eating	4	0.72	0.85
Food Preoccupation	4	0.74	0.82
Slow Eating	6	0.80	0.76

Perceived Social Pressure to Gain Weight	4	0.72	0.74
Vomiting and Laxatives	4	0.73	0.82
Eat-40-JOV	40	0.94	0.85

Statistical procedures

Percentages of persons at high and low risk were extracted. Logistic regression analysis was used to extract odds (ratio of the event happen in one group to that of the other group), and χ^2 (Chi-square) to test differences between percentages of persons at risk on different levels of a certain variable. Factor Analysis was used to measure construct validity of the tool.

Results

The total prevalence of students at risk for developing EDs among the university students who took part in the study was 14.2% (n=178). The Slow Eating factor in the EAT-40-JOV identified 70.1% of the students at risk of developing an eating disorder, followed by the Body Image for Thinness factor where 30.4% of the students were at risk (see Table 2).

Table 2. Prevalence of total risk of developing EDs and the number and percentage of women and men at the cutoff point for each of the seven factors in the EAT-40-JOV

Factors	Gender							
	Female				Male			
	High Risk		Low Risk		High Risk		Low Risk	
	N	%	N	%	N	%	N	%
Dieting	129	14.8%	742	85.2%	48	12.4%	338	87.6%
Body Image for Thinness	301	34.6%	570	65.4%	81	21.0%	304	79.0%
Clandestine Eating	51	5.9%	820	94.1%	19	4.9%	367	95.1%
Food Preoccupation	106	12.2%	765	87.8%	46	11.9%	339	88.1%
Slow Eating	646	74.2%	225	25.8%	234	60.8%	151	39.2%
Perceived Social Pressure to Gain Weight	228	26.2%	643	73.8%	93	24.2%	292	75.8%
Vomiting and Laxatives	44	5.1%	827	94.9%	15	3.9%	370	96.1%
EAT-40-JOV	137	15.7%	734	84.3%	41	10.6%	345	89.4%

The total prevalence of EDs among women was 15.7% (n=137) while among men it was 10.6% (n=41). The percentage of at-risk men and women differed significantly on the Slow Eating factor with 74.2% women and 60.8% men endorsing high scores, where $\chi^2=22.82$, which is significant at ($p<0.05$).

Women were 1.6 times more prone to having EDs compared to men in the student population studied. The

results of $\chi^2=23.06$ also revealed that men and women differed significantly on their views about Body Image for Thinness.

The highest prevalence rate was for the Slow Eating factor, in both the rural and urban areas (see Table 3), which was 70.8% (n=731) for students who were from urban areas and 66.5% (n=149) for students from rural

areas. No significant differences between ratios where $\chi^2 = 1.63$.

Table 3. Prevalence for each factor of the EAT-40-JOV and total prevalence according to residence of the student's family

Factors	Residence							
	Rural				Urban			
	High Risk		Low Risk		High Risk		Low Risk	
	N	%	N	%	N	%	N	%
Dieting	36	16.1%	188	83.9%	141	13.6%	892	86.4%
Body Image for Thinness	62	27.7%	162	72.3%	320	31.0%	712	69.0%
Clandestine Eating	10	4.5%	214	95.5%	60	5.8%	973	94.2%
Food Preoccupation	31	13.8%	193	86.2%	121	11.7%	911	88.3%
Slow Eating	149	66.5%	75	33.5%	731	70.8%	301	29.2%
Perceived Social Pressure to Gain Weight	57	25.4%	167	74.6%	264	25.6%	768	74.4%
Vomiting and Laxatives	9	4.0%	215	96.0%	50	4.8%	982	95.2%
EAT-40-JOV	32	14.3%	192	85.7%	146	14.1%	887	85.9%

The prevalence of predictive factors for developing EDs among first year students was 17.3% (n=62), among second year students was 12.8% (n=53), among third year students was 12.1% (n=37), and among fourth year students it was 14.5% (n=26). The results of the study showed no significant effect relating to the year of study observed on the prevalence of any factor for developing EDs.

Discussion

Many factors influenced the development of eating disorders (EDs), including age, gender, cultural views, and acculturation. For age, some studies found that the total prevalence of EDs reported varies widely. Estimates range from about 1.15% among college students to 21% (for those in the age range of 15-29 years).^{7,8} As this relates to gender, eating problems affect men and women alike although women are disproportionately affected with prevalence rates ranging from 5% to 20%; in men, this ranges from 0.64% to 10%.⁹⁻¹¹ Cultural values have been suggested as a

contributing factor in the increase of EDs. Studies across different cultures and within one cultural group across different countries highlight how EDs, especially anorexia nervosa, have become common and how they are influenced by dieting and western social values.³

Lastly, acculturation, which is described as “the process of shifting values to the host culture from the culture of origin,”⁸ has also shown a positive correlation with EDs.¹² In Jordan, licensed dieticians and psychiatrists, agree that Jordanian youth are increasingly affected by western culture in two ways: the first relates to a change in family lifestyle, e.g. eating fast foods is more commonplace now; and, the second relates to the more widely accepted belief that being thin is linked to physical beauty. This belief may be linked to an increase in obesity and dieting among adolescents and young adults that has led to a rise in the number of ED cases being reported,¹³ (personal communication: Nashashibi, Kour, Khalaf, Tamimi, Khatib, and Samawi, 2008). The process of acculturation is particularly apparent in university students, such as those attending the University of Jordan since many will have come from

different backgrounds, (e.g. rural areas, the desert) thus there is the prospect that many will undergo an acculturation process, which may include changes in body image.

Results from the current study suggested that the total prevalence of students who were at a predictive point for developing EDs was 14.2%. The prevalence rate among women was 15.7% and amongst men 10.6%. There were no significant differences relating to family residence. The association between the prevalence of EDs with the year of study at the University of Jordan was not statistically significant.

As for results of the prevalence of predictive factors for developing EDs, on each factor it was found that the highest prevalence was seen in the Slow Eating factor (70.1%), which consisted of the following items: 1- Like eating with other people, 18- Like my clothes to fit tightly, 19- Enjoy eating meat, 26- Take longer than others to eat my meals, 27- Enjoy eating at restaurant, 39- Enjoy trying new rich foods. The reason for the high rating on this factor might be due to the cultural emphasis on eating slowly as a preferred habit; Jordanians encourage their children to eat slowly and to avoid filling their mouths with too much food. It is also possible that students at this age start having the freedom to eat at different restaurants with their peers and enjoy trying new foods. Eating meat is associated with eating healthy and its importance is emphasized in our culture as well; this, with the above mentioned suggestions might have affected the result on this factor.

The second highest prevalence factor was the Body Image for Thinness factor. It represented a response rate of 34.6% while the lowest response for all seven factors was in relation to statements that explored student attitudes toward Vomiting and Laxatives and Clandestine Eating, which yielded a prevalence of 5.1%, and 5.9%, respectively. The prevalence rates for responses to statements relating to Vomiting and Laxatives and Clandestine Eating were the lowest across the seven factors. This might suggest that students who are at high risk of being bulimic or anorexic hold stronger opinions toward having Food Preoccupation or Drive for Thinness than those who were at higher risk. This would be expected since those who do develop serious EDs, such as anorexia nervosa, may be less open about discussing their views than those at risk for less serious tendencies.¹⁶

The total prevalence of predictive factors for developing of EDs, according to the EAT-40 JOV was 14.2%. In the study by Burcin and Murphy, the prevalence of college students who were at high risk of EDs was 15%.¹⁷

The results obtained in the present study were not very different from western studies, specifically studies carried out in the USA with the exceptional finding in this study that prevalence among men was higher than the rates found in most studies. This might be due to certain western socio-cultural values that many Jordanian students feel the need to adopt and live by as influenced, in many cases, by television and media and not as a result of living in a western country. Arguably, movie stars and models are the idols in this case and not normal realistic people.¹⁸

However, other studies were consistent with the current study in relation to the findings on acculturation - family residence and year of study. The results were not statistically significant on any of the factors of the EAT-40-JOV or the overall total, which may be attributable to family residence (Urban/Rural). This finding is supported in a study that examined the relationship between acculturation and EDs among Mexican-American women attending college in which the analysis revealed no significant relationship between acculturation and EDs.⁸

In terms of the prevalence of predictive factors for developing EDs and its association with the year of study, the current findings indicated that there was no statistical significant association between any of the seven factors that comprised the Eat-40-JOV and the year of study. Lipkin's study revealed no statistically significant results to support the hypothesis that roommates influence one another's eating attitudes and behaviors.¹⁹

Limitations and Recommendation

Very little research has been conducted in Jordan concerning EDs among the age 18-22 year olds. The current study investigated the prevalence rates for university students in that age range who were at risk of developing EDs. The results must be considered alongside a number of limitations. For example, a single assessment measure was used, namely the EAT-40-JOV and the researcher did not conduct clinical interviews with those who scored about the cutoff for meeting criteria for an eating disorder. Thus, further information was needed to substantiate the prevalence of EDs for the sample population.

The high prevalence of 70.1% in the Slow Eating factor may indicate that it is a culturally bound concept. This point is worth exploring in future studies since culture may have affected how the statements relating to that factor were perceived by participants and, therefore, may need to be modified or omitted. However, it may be

argued that if that particular factor was influenced by culture, then the prevalence as a whole would also be lower.

These observations about cultural influences are supported by the fact that at least four of the statements within the EAT-40-JOV seemed unfamiliar or too personal, according to some students. Their feedback included comments in relation to, for example, Item 23- "Have regular menstrual cycles", Item 35- "Suffer from constipation", item 13- "I vomit after I have eaten", and item 31- "I feel that food controls my life", and this may well raise questions about the validity of responses to these. It follows that there is a merit in expanding the research with a wider sample from the general population, which should include different age groups. It would be important to also ensure that ED tendencies in men are taken more seriously and future studies should reflect this by ensuring men are recruited to such studies. Future research must also seek to distinguish between the effect of acculturation and the stress that is often associated with it since that factor may lead to greater risk of EDs in certain groups.

Clinical implications

The current study highlights the vulnerability of young people, in this case, university students toward the development of EDs. It is a topic that has rarely been studied in Jordan and merits further research. Relatively high prevalence rates were identified, which can be used to raise awareness about eating disorders and their treatment. The EAT-40-JOV demonstrates good reliability and internal consistency, but should be used with caution in general health clinics given there may be cultural sensitivities in relation to some statements within the measure's seven subscales. However, the measure will go some way to support mental health practitioners, such as Psychiatrists and Clinical Psychologists in the screening of people who are at risk of developing EDs in order to provide them with much needed help.

References

1. Jimerson SR. Eating Disorders. Program at the University of California, Santa Barbara 2002.
2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Washington, DC: Author 2000.
3. Striegel-Moore RH, Smolak I. Eating Disorders: Innovative Directions in Research and Practice. American Psychological Association, Washington, DC 2001.
4. Polivy J, Herman CP. Causes of eating disorders. *Annu Rev Psychol.* 2002;53:187-213.
5. Gale Research. Gale Encyclopedia of Childhood & Adolescence; 1998. Available from: [www.findarticles.com].
6. Garfinkel PE, Garner DM: Anorexia Nervosa: A multidimensional perspective. New York: Brunner/Mazel 1982.
7. Diaz JM, Frano-Paredes K, Vazquez-Arevalo R, Lopez-Aguilar X, Alvarez-Rayon GL, Trinidad, Ma. et al. A Two-stage epidemiologic study on prevalence of EDs in female university students in Mexico. *European Eating Disorders Review* 2007;15: 463-470.
8. Germer J. The relationship between acculturation and eating disorders among Mexican-American college females. University of Northern Colorado, 112 pages, AAT 3139624. [www.eating-disorder.org] pages; AAT3068671, 2004.
9. Kitsantas A, Gilligan TD, Kamata A. College women with eating disorders: self-regulation, life satisfaction, and positive/negative affect. *J Psychol* 2003;137(4): 381-395.
10. Nelson WL. Normal and anorexic eating attitudes and behaviors in young adult college students: a descriptive study. Saint Louis University, 1993, 83 pages, AAT9416842.
11. Fernandez Palaez MA, Labrador FJ, Raich RM. Prevalence of EDs among adolescents and young adult scholastic population in the region of Madrid (Spain). *Journal of Psychosomatic Research* 2006; 62: 681-690.
12. National Eating Disorders Association. Eating Disorders in Women of Color: Explanation and Implication, 2006. Available from: [www.nationaleatingdisorders.org].
13. Gable B. Eating Disorders: Prevalence, Perceptions, and Treatments in Jordan, SIT Graduate Institute/SIT Study Abroad, Ohio Wesleyan University, 2014 http://digitalcollections.sit.edu/cgi/viewcontent.cgi?article=2812&context=isps_collection
14. Garner DM, Garfinkel PE. The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychol Medicine.* 1979;9(2):273-279.
15. شريقي ناصر، عبد الحميد منى، مايو (2005)، اضطرابات الطعام عند نساء أردنيات (دراسة بحثية تجميعية). *المجلة العربية للطب النفسي، المجلد السادس عشر: العدد الأول*
16. Taylor JY, Caldwell CH, Baser ER, Faison N, Jackson JS. Prevalence of eating disorders among blacks in the national survey of American life. *Int J Eat Disord.* 2007;40:S10-S14, DOI 10. 1002/eat.
17. Burcin MM. Examination of the prevalence of eating disorders behaviors at two distinct periods of time among first semester college freshmen. University of South Carolina, 2006, 172 pages, AAT 3245387.
18. فرج، صفوت والصبرة، محمد تركي، مصطفى، (2005)، مرجع إكلينيكي في الاضطرابات النفسية. القاهرة مصر، مكتبة الأنجلو المصرية.
19. Lipkin JR. Epidemiologic changes in Bulimia behavior among female adolescents over a ten-year period. PhD Dissertation, Northern University, United States-Illinois, 1994. Retrieved November 3, 2008, from Dissertations and Theses: Full Text database. (Publication No. AAT 9521756).

ملخص

تهدف هذه الدراسة إلى معرفة نسبة انتشار العوامل التي تزيد من احتمال الإصابة باضطرابات الأكل لدى طلبة الجامعة الأردنية وعلاقتها ببعض المتغيرات الديموغرافية وهي الجنس والسنة الدراسية في الجامعة ومكان إقامة العائلة. كان مجتمع الدراسة يشتمل على طلبة البكالوريوس في كل الكليات في الجامعة الأردنية باستثناء طلبة السنة الخامسة والدراسات العليا، كما تم اختيار 30 شعبة عشوائياً مثلت الطلبة المسجلين في الفصل الثاني من العام الدراسي 2007/2008، وقد جاءت العينة متناسبة مع العدد الكلي للطلبة في الكليات. علماً بأن العدد الكلي للشعب المتوفرة في الفصل الدراسي المذكور كان (4567) شعبة.

وقد جاءت العينة من (1275) طالباً تتراوح أعمارهم بين 18-22 سنة، حيث مثلت نسبة الإناث 871 طالبة، أما الذكور فكانت 386 طالباً.

استخدمت الباحثة اختبار يحمل اسم الاتجاه نحو الأكل "ويتكون من 40 فقرة"، وهذا الاختبار تم تطويره من قبل الباحثين جارنر وجارفنكل سنة 1979، وقد قام بترجمته إلى العربية الدكتور الشريقي الطبيب النفسي في الخدمات الطبية الملكية في عمان / الأردن.

وقد تم استخدام هذا الاختبار بعد التأكد من صدقه وثباته المتوافقين مع أهداف هذه الدراسة. أما الاختبار المستخدم فقد كان مشابهاً لأنموذج البريطاني الأصلي، مما أثبت صدق الاختبار وقد نتج عن ذلك نموذجاً أردنياً يتمتع بصدق وثبات للعينة الدراسية.

كشفت الاختبار عما نسبته 14.2% من الطلبة الذين تزيد عندهم احتمالية الإصابة باضطرابات الأكل، وقد جاءت نسبة الذكور 10.6% أما نسبة الإناث فقد تمثلت بـ 15.7%، ولم يشر الاختبار إلى وجود فروق ذات دلالة لمتغيري مكان إقامة العائلة أو السنة الدراسية للطلاب.

أشارت نتائج الدراسة إلى أن نسبة انتشار العوامل التي تزيد من احتمال الإصابة باضطرابات الأكل قد جاءت متشابهة مع النتائج التي توصلت إليها الدراسات في الولايات المتحدة الأمريكية، إلا أن الفرق الوحيد الذي سجلته الباحثة في هذه الدراسة هو أن نسبة انتشار العوامل التي تزيد من احتمال الإصابة باضطرابات الأكل بين الذكور جاءت أعلى، في حين اتفقت هذه الدراسة مع غيرها من الدراسات حول وجود علاقة ذات دلالة مع متغير السنة الدراسية ومكان إقامة العائلة.

Author

Ms Basma Fouad Kilani, MA

Clinical Psychologist, Maria Den Braven Center - Amman, Jordan

Email: basma@mdb-center.com

A Validation Study of a New Arabic Version of the Adult Dispositional Hope Scale in a Sample of Lebanese College Youth

Remy R. Elias and Shahe Kazarian

دراسة تحقيقية للصورة العربية الجديدة لمقياس الأمل الطبيعي عند البالغين في عينة من الطلاب

الجامعيين اللبنانيين

ريمي ر. الياس وشاهي كزاريان

Abstract

Objectives: The present study investigated the factor structure of the Arabic translation of the Adult Dispositional Hope Scale (Arabic ADHS), a measure of the agency and pathways components of the personality trait of hope, and the relation of the hope trait to parenting styles as well as the positive psychology constructs of optimism, affect, and resilience. **Method:** A total of N=275 Lebanese college youth (56.4% female) were administered in a counterbalanced order the Arabic ADHS, and the Arabic versions of the Parental Authority Questionnaire (Arabic PAQ), the Revised Life Orientation Scale (Arabic RLOS), the Positive and Negative Affect Schedule (Arabic PANAS), and the Connor-Davidson Resilience Scale (Arabic CDRS). **Results:** Principal factor analysis of the Arabic ADHS confirmed a one-factor structure with invariance across males and females. Multiple regression analyses showed resilience followed by positive affect, authoritative parenting, and negative affect as contributing factors to prediction of Arabic hope scores. **Conclusion:** The findings indicate that the hopeful mind of Lebanese college youth does not differentiate the agency trait of hope from the pathways trait of hope, and highlight the pertinence of authoritative parenting, resilience, and positive emotions to the personality trait of hope.

Keywords: Hope, optimism, affect, authoritative parenting, resilience, Lebanese youth

Declaration of Interest: None

Introduction

Over the past three decades the psychological concept of hope has been understood largely from a theoretical perspective, which describes it as a personality characteristic comprised of two traits: Agency and Pathways.¹⁻⁷ People who have high hope perceive themselves with high ability when setting goals (agency trait) and high ability for generating pathways to realize their goals (pathways trait). Informed by the agency thinking and pathways thinking, hope theory, Snyder and colleagues have developed and validated a trait measure of hope for children,⁸ a state measure of hope for adults,⁹ and a trait measure of hope for adults.¹ Over the past two decades, studies on hope as a personality trait have been informed by positive psychology. As a personality trait, hope has been shown to correlate with positive psychology constructs such as self-esteem, life satisfaction, optimism, positive affect, academic success, and spirituality.¹⁰⁻¹⁵ Similarly, the personality trait of hope has been shown to be a vulnerability factor in negative affect generally as well as anxiety and

depression.^{10,16-18} Finally, hope as a personality trait has been shown to be a strong predictor of adverse health outcomes such as myocardial infarction and cancer, above and beyond depression and traditional risk factors¹⁹⁻²⁰ as well as a risk factor for poor diabetic management.²¹

The Adult Dispositional Hope Scale¹(ADHS) is the most widely used individual differences measure of hope. The 12-item, self-report ADHS is informed by Snyder's two-factor Hope Theory⁶ and validated in the US.¹ Since the availability of the English version of the ADHS,^{1,13} the scale has been translated into multiple languages,^{10-13, 15,17,22-24} including Arabic¹⁶for the purposes of validating the cross-cultural equivalence and universality of the instrument as well as its underlying theory.

In the present study, the ADHS was translated into Arabic, and its reliability and validity was examined in the context of Lebanese college youth. Validation of a new translation of the ADHS into Arabic was informed on methodological grounds. Firstly, the new Arabic

version was back-translated because of the potential difficulties associated with linguistic or dialectical adaptation of Arabic translations from other Arabic-speaking regions, the Kuwaiti version in this case.¹⁶ Secondly, the Arabic version of the ADHS that was developed in Kuwait for use with Kuwaiti college students relied on a principal components factor analysis with a Varimax solution and a single test (eigenvalues) to determine the number of factors to be extracted.¹⁶ Validation studies of psychological measures rely on an Oblique solution if conceptually called for such as when two or more factors of a scale are conceptually interdependent rather than independent. The agency trait and the pathways trait are theorized to be highly interdependent,¹ a proposition supported empirically by the $r=.67$ reported for the relationship between the two factors of the Arabic version of the ADHS.¹⁶ Thirdly, determination of the number of factors underlying the factor structure of the hope scale developed in Kuwait relied on a single rather than multiple indicators such as the scree test²⁵ and parallel analysis.²⁶ Fourthly, the hope scale developed in Kuwait was not tested for factorial invariance across groups of men and women; it showed less than an acceptable level of internal consistency for the total scale ($\alpha=.68$); and even though a two-factor structure was suggested, internal consistencies of the Agency trait factor and the Pathways trait factor were not reported.¹⁶

In the present study, the factor structure of the new Arabic version of the ADHS was evaluated using principal factor analysis. We expected two reliable empirically derived factors corresponding to those postulated by Snyder's Hope Theory.⁶ In view of ADHS being a trait personality measure of hope, we also examined the relationship between hope and the three parenting styles of authoritarianism, permissiveness and authoritative.²⁷ Baumrind²⁷ considered two-dimensional parenting factors, warmth and control, to influence the three parenting styles. Authoritarian parents tend to show high punitive behavioral control and low warmth; permissive parents show low behavioral control but high warmth, and authoritative parents maintain high assertive behavioral control and high warmth. We expected authoritative parenting to correlate positively with the personality trait of hope, whereas we expected both permissive and authoritarian parenting to correlate negatively with the personality trait of hope.

In addition to evaluation of the factor structure of the Arabic version of the ADHS and its relation to parenting, Arabic ADHS scores were examined in the context of four theoretically grounded positive psychology

constructs: optimism, positive affect, negative affect, and resilience. Since optimism is a general sense that good things will happen²⁸ and is not inclusive of the pathways thinking trait that is characteristic of hope, we expected a moderate positive relationship between Arabic ADHS scores and optimism scores. Similarly, since people high on the traits of agency and pathways—those who perceive themselves with high ability of setting goals and generating pathways to obtain these goals are more likely to experience positive emotional states⁶, we expected a positive relationship between Arabic ADHS scores and positive affect and a negative relationship with negative affect. In addition, since Snyder's Hope Theory⁶ proposes that people high on the personality trait of hope have better agency and better ability to find pathways to deal with and overcome stressors in life, we expected Arabic ADHS scores to correlate positively with resilience scores.

Method

Participants and procedure

A total of $N=275$ college youth from a private foreign-affiliated American university in Lebanon participated in the study. The majority were women (56.4%) and their mean age was 18.47 years ($SD=1.43$) with a range from 18 to 23 years. The participants were Lebanese (76%) and Lebanese with other nationalities (24%).

Using convenience sampling, participants were recruited from introductory psychology classes. Students enrolled in the Psychology 201 course were sent, via the participant pool coordinator (PPC), an online announcement advertising the study. Interested participants were directed then to the informed consent through a Doodle link. Upon participation, they received course credit for their involvement in the study.

Those who consented were administered in a counter-balanced order to minimize order effects a questionnaire battery that included the Arabic versions of the Adult Dispositional Hope Scale¹ (Arabic ADHS), the Parental Authority Questionnaire³⁰ (Arabic PAQ), the Revised Life Orientation Test²⁹ (Arabic LOT-R), the Positive and Negative Affect Schedule³⁴ (Arabic PANAS), and the Conner-Davidson Resilience Scale³¹ (Arabic CDRISC-10). The PAQ and the CDRISC-10 did not require translation, since they were both available in the Arabic language.³⁰⁻³¹ While the PAQ has been validated in the case of Lebanese college youth, we were interested in extending similar validation to the CDRISC-10, the

LOT-R and the PANAS. The three measures (ADHS, LOT-R, PANAS) were translated into Arabic by using a backward translation methodology. A bilingual translator translated the original versions of the three measures, and then another bilingual translator translated the Arabic versions back into English, independent of the first translator. The two English versions were compared and differences reconciled.

Instrumentation

Arabic Version of the Parental Authority Questionnaire³⁰ (Arabic PAQ)

The 30-item Arabic PAQ is a measure of the parenting styles of authoritativeness (10 items), permissiveness (10 items), and authoritarianism (10 items). Each item requires rating of both parents (the Ahel, in Arabic) from 1 (Strongly disagree) to 5 (Strongly agree), higher scores representing higher parenting styles. Internal consistencies of .72, .79, and .61 for authoritative, authoritarian, and permissive parenting, respectively are reported for the Arabic version of the scale.³² The internal consistencies of the authoritative, authoritarian, and permissive parenting derived from the Arabic PAQ in the present study were $\alpha=.84$, $\alpha=.82$, and $\alpha=.64$, respectively. These findings compare with the internally consistencies $\alpha=.86$ for authoritative, $\alpha = .85$ for authoritarian and $\alpha=.76$ for permissive parenting reported by Saleh and Kazarian.³³ Authoritative parenting scores in the present study were negatively correlated with authoritarian parenting ($r=-.43$, $p<.001$) but not permissive parenting ($r=.08$, ns) and authoritarian parenting was not correlated with permissive parenting ($r=.01$, ns). These findings compare with those reported by others³³: $r=-.52$ ($p<.001$) between authoritarian and authoritative parenting, $r=-.21$, ($p<.001$) between authoritarian and permissive parenting, and $r = -.21$ ($p<.001$) between authoritative and permissive parenting.

Arabic Version of the Revised Life Orientation Test²⁹ (Arabic LOT-R)

The 10-item Arabic LOT-R consists of three optimism items, three pessimism items, and four distracters items. Each item requires rating from 0 (Strongly disagree) to 4 (Strongly agree), higher scores signifying higher optimism. An internal consistency of .78 is reported for the English version of the scale.²⁹ The internal consistency of the Arabic LOT-R in the present study was $\alpha=.62$.

Arabic Version of the Adult Dispositional Hope Scale¹ (Arabic ADHS)

The 12-item Arabic ADHS consists of four agency trait items (items 2, 9, 10 and 12), four pathways trait items (items 1, 4, 6, 8), and four distracter items (see Appendix A). Each item requires rating from 1 (Definitely False) to 8 (Definitely True), higher scores signifying higher the personality trait of hope. Internal consistencies that range from .74 to .84 are reported for the English version of the scale.¹

Arabic Version of the Positive and Negative Affect Schedule³⁴ (Arabic PANAS)

The 20-item Arabic PANAS comprises 10 positive affect items and 10 negative affect items. Each item requires rating from 1 (Very Slightly or Not at all) to 5 (Extremely), higher scores signifying higher positive affect or higher negative affect. Internal consistencies of the positive affect scale and negative affect scales derived from the English version of the PANAS are $\alpha = .89$ and $\alpha = .85$, respectively.³⁵ The internal consistencies of the Positive Affect and Negative Affect scales derived from the Arabic PANAS were $\alpha=.79$ and $\alpha=.81$, respectively, and their inter-correlation was non-significant ($r=-.02$, ns).

Arabic Version of the Connor-Davidson Resilience Scale³¹ (CD-RISC-10)

The 10-item Arabic CD-RISC-10 measures resilience. Each item is rated from 0 (Strongly disagree) to 4 (Strongly agree), higher scores suggesting higher resilience. An internal consistency of $\alpha=.85$ is reported for the Arabic version of the scale³⁶ (Campbell-Sills & Stein, 2007). The internal consistency of the Arabic CD-RISC-10 in the present study was $\alpha=.83$.

Results

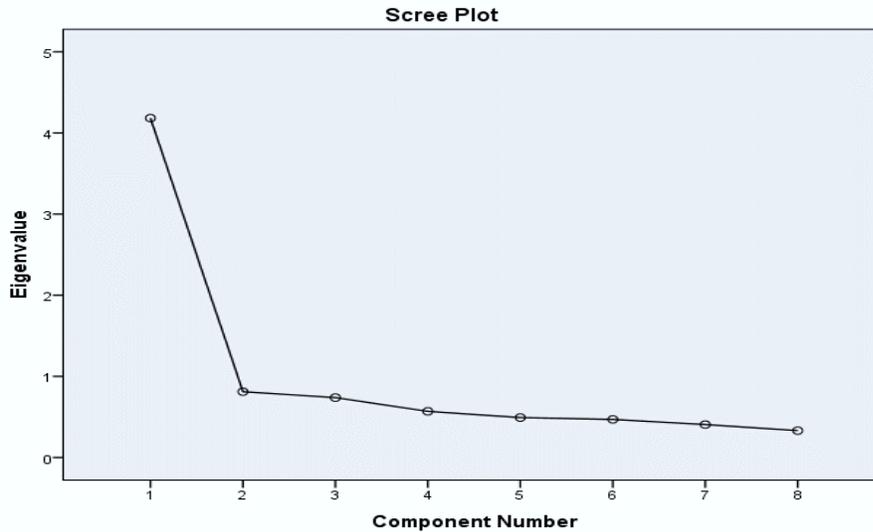
Arabic ADHS: factor structure and reliability

The set of 8 items of the Arabic ADHS was subjected to a principal factor analysis (Oblimin rotation) using SPSS version 16. Bartlett's test of sphericity was statistically significant ($\chi^2 (28) = 796.46$, $p<.05$) and the Kaiser-Meyer-Olkin (KMO) value of .90 exceeded the KMO value of .60 as suggested by Kaiser.³⁷ Both of these findings supported the factoriability of the correlation matrix.

As can be seen in the scree plot (Figure 1), the results for the total sample revealed the presence of one factor with an eigenvalue of 4.183, accounting for a total of 62.43% of the variance. All items had factor loadings of .47 and above. The internal consistency of the Arabic ADHS was $\alpha=.87$, a value higher than the $\alpha=.67$ reported

for the old Arabic version of the ADHS¹⁶ and comparable to the $\alpha=.83$ and the $\alpha=.86$ reported for the Spanish¹¹ and English¹³ versions of the scale, respectively.

Figure 1: Scree Plot of the Arabic Dispositional Hope Scale items



Arabic ADHS scores were weakly correlated with age ($r=.13, p<.05$). Also scores of males on the Arabic ADHS were comparable to those of females ($M=48.20, SD=7.85$ for males and $M=47.05, SD=8.80$ for females; $t(254) = -1.09, ns$). The independence of age and gender from ADHS scores is consistent with findings reported by others.¹⁵

loadings of .62 and above. Similarly, the results for the sample of women revealed the presence of one factor with an eigenvalue of 4.258, accounting for a total of 53.22% of the variance. All items had factor loadings of .40 and above. The internal consistencies of the Arabic ADHS for females and males were $\alpha=.87$ and $\alpha=.86$, respectively.

Arabic ADHS: factor invariance

Separate factor analyses were conducted for males and females to examine the invariance of the factor structure of the Arabic ADHS across gender. Bartlett’s test of sphericity was statistically significant for the male sample ($\chi^2(28) = 322.53, p<.05$) and the female sample ($\chi^2(28) = 494.96, p<.05$). Similarly, the Kaiser-Meyer-Olkin (KMO) values of .88 for both men and women exceeded the KMO value³⁷ of .60. Both of these findings supported the factoriability of the correlation matrix for men and women.

Arabic ADHS and parenting

Arabic ADHS scores correlated positively with authoritative parenting scores ($r=.36, p<.001$) but not authoritarian parenting ($r=-.11, ns$) or permissive parenting ($r=.12, ns$). These findings compare to the correlations of $r=.35$ for authoritative parenting, $r=.024$ for authoritarian parenting and $r=-.053$ permissive parenting reported for Australian adolescents.³⁸ The findings in the present study suggest that the personality trait of hope as measured by the Arabic ADHS is related to authoritative parenting, but not authoritarian or permissive parenting.

The results for the sample of men revealed the presence of one factor with an eigenvalue of 4.089, accounting for a total of 51.11% of the variance. All items had factor

Correlations between Arabic ADHS and positive psychology constructs

Arabic ADHS scores were correlated with optimism scores, positive and negative affect scores, and resilience scores. As expected, Arabic ADHS scores correlated positively with optimism scores ($r=.39, p<.001$), positive affect scores ($r=.50, p<.001$), and resilience scores ($r=.56, p<.001$), and negatively with negative affect scores ($r=-.22, p<.01$). Taken together, these findings indicate that optimism, positive and negative affect, and resilience are related to the personality trait of hope as measured by the Arabic ADHS.

Forward multiple regression analysis with Arabic ADHS scores as dependent variable and optimism, positive and negative affect, resilience, and the parenting styles of authoritative, authoritarian, and permissive as predictor variables showed resilience as the strongest predictor of Arabic ADHS scores ($\beta=0.34, p<0.001$), followed by positive affect ($\beta=0.28, p<0.001$), authoritative parenting ($\beta=0.22, p<0.001$), and negative affect ($\beta=-0.14, p<0.05$) which cumulatively explained 45% of the variance.

Discussion

This is the first study that evaluates the validity of the Arabic translation of the ADHS by examining its factor structure and its relationship with theoretically grounded correlates in a group of Lebanese college youth. As such, an important purpose of the study was validation of the Arabic ADHS, in the case of Lebanese college youth with a view to extension of such investigations to the larger youth population in Lebanon. Nevertheless, our findings on the psychometric properties of the ADHS and the other measures require replication and further standardization. For example, a limitation of the Arabic PAQ is that it does not consider parenting which is low in both the warmth and control dimensions. Similarly, the relation of our measures to social desirability requires further elucidation.

Contrary to our hypothesis, we extracted a reliable single factor representing the personality trait of hope rather than the traits of agency and pathways as postulated by the theoretical grounding of the individual difference measure in the US.¹ Our findings are consistent with those reported for the Spanish¹¹ and Portuguese¹⁵ validations of the ADHS in college youth but not the English version¹ of the ADHS or the Chinese,²³ Arabic¹⁶ and French¹⁰ translations of the scale. Studies that have

supported a two-factor solution have nevertheless noted high correlations between agency thinking and pathways thinking, further suggesting the viability of a single

factor structure for the ADHS. For example, a correlation of $r=.67$ between the agency thinking and pathways thinking was reported for the Arabic translation¹⁶ of the ADHS while an $r=.78$ was reported for the French translation.¹⁰

In the present study, the factor structure of the Arabic ADHS was invariant across gender, a finding consistent with factorial invariance reported by others.^{10, 17} The one-factor structure obtained in the case of the Arabic ADHS and the factor structure invariance across the sample of men and women suggest that the hopeful mind of Lebanese university students, like their counterparts for example in Spain¹¹ and Portugal,¹² do not differentiate between agency thinking and pathways thinking in the way that, for example, US¹ or Chinese²³ college youth do. One possible explanation for the single factor structure obtained in the present study is the nature of the ADHS items themselves in that the items representing agency thinking and pathways thinking are seemingly more blurred or not as conceptually distinct for the Lebanese college youth as they are for university students from the US. It might be that for Lebanese youth, pathways may mean more than repeatedly creating routes that lead to the accomplishment of goals. An alternative explanation is that the collectivist culture embedding Lebanese youth is confounding or possibly diminishing of their agency and pathways in that family and kin tend to play a significant role in blurring their children's agency with their own and being participants in determining the pathways-choices and decisions of college youth. As such, agency thinking and pathways thinking is seemingly not as distinct in the case of Lebanese college youth as they are in the case of agency oriented American college youth. For example, whereas American university students are likely to decide on pathways to achieve their life goals, Lebanese youth who stay financially dependent on their family and kin until they graduate from university are often forced to comply with their family's choices of pathways for success or alternatively are more assisted by their family and kin in coming up with potential ways to achieve their goals.

We hypothesized authoritative parenting to correlate positively with the personality trait of hope, whereas we expected both permissive and authoritarian parenting to correlate negatively with the personality trait of hope. In the present study, authoritative but not authoritarian and permissive parenting was associated with the personality trait of hope, suggesting that only parents who are high on warmth and assertive behavioral control are likely to invoke the personality trait of hope, findings consistent with those reported by others.³⁸⁻³⁹ Arabic ADHS scores

correlated in the expected directions with optimism scores, positive and negative affect scores and resilience scores. The finding of a moderate positive correlation between Arabic ADHS scores and optimism is consistent with correlations reported for the French¹⁰ and Portuguese¹² validations of the ADHS. Similarly the findings of a positive correlation with positive affect and a negative correlation with negative affect are consistent with the French¹⁰ validation of the ADHS and the study on Turkish²⁴ university students. While the personality trait of hope as hypothesized is associated with optimism, positive and negative affect and resilience such that people with high hope tend to report less negative affect and more optimism, positive affect, and resilience, the findings are correlational and as such limited in causal inferences. For example, high hope may contribute to high positive affect, but it is equally likely that high positive emotions invoke high hope.

Finally, the regression analysis showed that resilience, positive and negative affect, and authoritative parenting, but not optimism, were the best predictors of the personality trait of hope. It is possible that authoritative parenting has the benefit that it engenders the personality trait of hope by invoking a family climate of positive emotions and resilience whereas authoritarian and permissive parenting styles do not show this advantage.⁷ It is equally likely that children with resilience and positive emotional dispositions evoke authoritative parenting with a positive influence on the personality trait of hope.

Conclusion

The preset study relied on self-report measures, a correlational design, and a convenient sample of university students. As such, demand characteristics, response style, lack of causal inferences and generalization to populations other than college youth are limitations of the study. While the findings also require replication, tentative conclusions can be drawn. It is possible to view the hopeful mind of the Lebanese university student as not differentiating the agency trait from the pathways traits. Secondly, the findings implicate authoritative parenting, resilience and positive emotions in the personality trait of hope, and as such highlight their pertinence as potential targets for intervention, particularly in national contexts replete with civil and politically informed divisiveness and stress.

Acknowledgment

The present study would have not been possible without the contribution and support of certain people. Thank you to Dr Fatima Al Jamil and Dr Alaa Hijazi for each of your contributions to the methodology. Thank you Dr May Awaida for the assistance you provided throughout the entire process of data collection. Also, thank you Dr Charles Harb for the guidance you provided with some of the statistical analyses of this study.

References

1. Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST, Yoshinobu L, Gibb J, Langelle C, Harney P. The will and the ways: development and validation of an individual-differences measure of hope. *J Person Soc Psychol.* 1991;60(4):570-585.
2. Babyak MA, Snyder CR, Yoshinobu L. Psychometric properties of the Hope Scale: A confirmatory factor analysis. *J Research Personality* 1993; 27: 154-169.
3. Snyder CR, Cheavens J, Sympson SC. Hope: An individual motive for social commerce. *Group Dynamics: Theory, Research, Practice* 1997; 1:107-118.
4. Snyder CR, Lapointe AB, Crowson JJ, Early S. Preferences of high-and low-hope people for self-referential in- put. *Cognition & Emotion* 1998; 12, 807-823.
5. Snyder CR. The psychology of hope: You can get there from here. New York: Free Press, 1994.
6. Snyder CR. (Ed.). The handbook of hope: Theory, measures, and applications. San Diego, CA: Academic Press, 2000.
7. Snyder CR. Hope theory: Rainbows in the mind. *Psychol Inquiry* 2002;13:249- 275.
8. Snyder CR, Hoza B, Pelham WE, Rapoff M, Wate L, Danovsky M, et al. The development and validation of the Children's Hope Scale. *J Pediatric Psychol.* 1997;22:399-421.
9. Snyder CR, Sympson SC, Ybasco FC, Borders TF, Babyak MA, Higgins, RL Development and Validations of the State of Hope Scale. *J Personal Soc Psychol.* 1996;70:321-335.
10. Gana K, Diagre S, Ledrich J. Psychometric properties of the French version of the Adult Dispositional Scale. *Assessment* 2013;20:114-118.
11. Galiana L, Oliver A, Sancho P, Tomas JM. Dimensionality and validation of the Dispositional Hope Scale in a Spanish sample. *Soc Indicat Res.* 2015;120: 297-308.
12. Pacico JC, Bastianello MR, Zanon C, Hutz CS. Adaptation and validation of the Dispositional Hope Scale for adolescents. *Psicologia: Reflexo e Critica.* 2013;26:488-492.
13. Snyder CR, Shorey HS, Cheavens J, Mann Pulvers K, Adams VH, Wiklund, C. Hope and academic success in college. *J Educat Psychol.* 2002;94:820-826.

14. Valle MF, Huebner ES, Suldo SK. An analysis of hope as a psychological strength. *J School Psychol.* 2006; 44:393-406.
15. Marques SC, Lopez SJ, Fontaine AM, Coimbra S, Mitchell, J. Validation of a Portuguese version of the Snyder Hope Scale in a sample of high school students. *J Psychoeducational Assessment* 2014;32: 781-786.
16. Abdel-Khalek A, Snyder CR. Correlates and predictors of an Arabic translation of the Snyder Hope Scale. *J Pos Psychol.* 2007;2:228-235.
17. Edwards LM, Ong AD, Lopez, SJ. Hope measurement in Mexican American youth. *Hispanic J Behav Sci.* 2007;29,225-241.
18. Wong SS, Lim T. Hope versus optimism in Singaporean adolescents: Contributions to depression and life satisfaction. *Personal Individ Diff.* 2009;46: 648-652.
19. Everson, SA, Goldberg DE, Kaplan GA, Cohen RD, Pukkala E, Tuomilehto J, Salomen JT. Hopelessness and risk of mortality and incidence of myocardial infarction and cancer. *Psychosomatic Med.* 1996;58: 113-121.
20. Irving LM, Snyder CR, Crowson JJ. Hope and the negotiation of cancer facts by college women. *J Personality* 1998;66:195-214.
21. Allen JV, Steele RG, Nelson MB, Peugh J, Egan A, Clements M, Patton SR. A longitudinal examination of hope and optimism and their role in Type 1 diabetes in youths. *J Pediatric Psychol.* 2016;41:741-749.
22. Kato T, Snyder CR. The relationship between hope and subjective well-being: Reliability and validity of the Dispositional Hope Scale, Japanese version. *Japanese J Psychol.* 2005;76:227-234.
23. Sun Q, Ng KM, Wang C. A validation study on a new Chinese version of the Dispositional Hope Scale. *Measurement Evaluation Counseling Development* 2012;45:133-148.
24. Demirli A, Turkmen M, Arik RS. Investigation of dispositional and state hope levels' relations with student subjective well-being. *Soc Indicat Res.* 2014; 120:601-613.
25. Cattell RB. The scree test for number of factors. *Multivariate Behavioral Research* 1966;1:245-276.
26. Horn JL. A rationale and test for the number of factors in factor analysis. *Psychometrika* 1965;30: 179-185.
27. Baumrind D. The influence of parenting style on adolescent competence and substance use. *J Early Adolesc.* 1991;11:56-95.
28. Scheier MF, Carver CS. Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychol.* 1985;4:219-247.
29. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *J Personal Soc Psychol.* 1994;67: 1063-1078.
30. Dwairy M. Parenting styles and psychological adjustment of Arab adolescents. *J Transcult Psychiatry.* 2004;41:233-252.
31. Connor KM, Davidson JRT. Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression Anxiety* 2003;18:71-82.
32. Dwairy M, Achoui M, Abouserie R, Farah A, Ghazal I, Fayad M, Khan H. Parenting styles in the Arab societies: A first cross-regional research study. *J Cross-Cultural Psychol.* 2006;37:230-247.
33. Saleh AOA, Kazarian SS. Perceived parenting styles and their relationship to basic psychological needs satisfaction, mental health and flourishing in a sample of Lebanese college youth. *Arab J Psychiatry.* 2015; 26:155-163.
34. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *J Personal Soc Psychol.* 1988; 54:1063-1070.
35. Crawford JR, Henry JD. The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *Br J Clin Psychol.* 2004; 43:245-265.
36. Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor- Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *J Traumatic Stress* 2007; 20: 1019-1028.
37. Kaiser H. An index of factorial simplicity. *Psychometrika.* 1974;39:31-36.
38. Shahimi P, Heaven P, Ciarrochi J. The interrelations among perception of parental styles and psychological well-being in adolescence: A longitudinal study. *Iranian J Public Health.* 2013;42: 570-580.
39. Heaven P, Ciarrochi J. Parental styles, gender and the development of hope and self-esteem. *Eur J Personality* 2008;22:707-724.

المخلص

الأهداف: تهدف هذه الدراسة الى استقصاء كيفية عمل هيكلية الترجمة العربية لمقياس الأمل الطبعي عند البالغين (Arabic Translation of the Adult Dispositional Hope Scale) وهو مقياس مكونات قوة سمات الشخصية المُفعمة بالأمل ومساراتها، والعلاقة بين الأمل وأنماط التربية، إضافة الى علم النفس الإيجابي المبني على التفاؤل، والتأثر العاطفي، والمرونة. **الطريقة:** تم أخذ عينة مؤلفة من 275 طالب لبناني جامعي (ما يعادل 56.4%) لإجراء، بترتيب موازن، اختبار الأمل (Arabic ADHS) والنسخ العربية من استبيان السلطة الأبوية (Arabic PAQ) والاختبار العربي للتوجهات الحياتية (Arabic RLOS) ومقياس العاطفة السلبية والإيجابية (Arabic PANAS) ومقياس كونور-ديفيدسون للمرونة (Arabic CDRS). **النتائج:** أكدت نتائج تحليل العامل الرئيسي لمقياس الأمل (Arabic ADHS) وجود بُنية ذات عامل واحد غير قابلة للتغير عند الذكور والإناث. كما أشارت عدة تحاليل تراجعية الى عامل المرونة تليه المشاعر الإيجابية ومن ثم أساليب التربية الصارمة والمشاعر السلبية التي شكّلت جميعها عوامل مساهمة في توقع نتائج اختبار الأمل العربي. **الخلاصة:** تشير النتائج إلى أن عقل الشباب الجامعيين اللبنانيين المُفعم بالأمل لا يميّز بين قوة سمة الأمل ومساراتها، ويسلّط الضوء على الصلة الوثيقة بين أساليب التربية الأبوية الصارمة، والمرونة، والعواطف الإيجابية وسمة الشخصية المُفعم بالأمل.

كلمات أساسية: الأمل، التفاؤل، العاطفة، أساليب التربية الصارمة، المرونة، الشباب اللبناني

Corresponding author

Ms Remy Elias

M.A. Psychology, Department of Psychology, American University of Beirut, Beirut 1107-2020 - Lebanon

Email: remyelias1@gmail.com

Authors

Ms Remy Elias

M. A. Psychology, Department of Psychology, American University of Beirut, Beirut 1107-2020 - Lebanon

Dr Shahe S. Kazarian, PhD, Department of Psychology, American University of Beirut, Beirut 1107-2020 - Lebanon

Appendix A

Arabic Version of the Adult Dispositional Hope Scale (Arabic ADHS)

مقياس الأمل للبالغين

التعليمات: اقرأ (ي) كل بند بعناية. باستخدام المقياس المبين أدناه، يرجى تحديد الرقم الذي يعبر عنك (ي) وضع (ي) هذا الرقم في الفراغ أدناه.

8= صحيح بالتأكيد	7= صحيح في الغالب	6= صحيح إلى حد ما	5= صحيح قليلاً	4= خطأ قليلاً	3= خطأ إلى حد ما	2= خطأ في الغالب	1= خطأ بالتأكيد
------------------	-------------------	-------------------	----------------	---------------	------------------	------------------	-----------------

صحيح بالتأكيد	صحيح في الغالب	صحيح إلى حد ما	صحيح قليلاً	خطأ قليلاً	خطأ إلى حد ما	خطأ في الغالب	خطأ بالتأكيد		
8	7	6	5	4	3	2	1	أستطيع أن أفكر في العديد من الطرق للخروج من الضغط	1
8	7	6	5	4	3	2	1	أنا أتابع أهدافي بنشاط	2
8	7	6	5	4	3	2	1	أشعر بالتعب معظم الوقت	3
8	7	6	5	4	3	2	1	هناك الكثير من الطرق حول أي مشكلة	4
8	7	6	5	4	3	2	1	أنا أسقط بسهولة في أي نقاش	5
8	7	6	5	4	3	2	1	أستطيع أن أفكر في طرق عديدة للحصول على الأشياء المهمة بالنسبة لي في الحياة	6
8	7	6	5	4	3	2	1	أنا قلق حول صحتي	7
8	7	6	5	4	3	2	1	حتى عندما يشعر الآخرون بالإحباط، أنا أعلم أنه يمكنني أن أجد طريقة لحل المشكلة	8
8	7	6	5	4	3	2	1	تجاربي في الماضي قد أعدتني بشكل جيد لمواجهة المستقبل	9
8	7	6	5	4	3	2	1	لقد كنت ناجحاً جداً في الحياة	10
8	7	6	5	4	3	2	1	عادة ما أجد نفسي قلق حول شيء ما	11
8	7	6	5	4	3	2	1	أحقق الأهداف التي أضعتها لنفسي	12

Chronic Koro-Like Syndrome Co-morbid with Schizophrenia and History of Cannabis Abuse in an Egyptian Patient: Case Report

El-Tantawy, AMMA

متلازمة شبيهة كورو المزمنة مصاحبة للفصام مع تاريخ سابق بإساءة استخدام الحشيش في مريض مصري: تقرير حالة

أشرف محمد محمد علي الطنطاوي

Abstract

Introduction: Koro, or Genital Retraction Syndrome (GRS), is a culture-bound syndrome, which was first identified in Southeast Asia. It has occurred as an epidemic in some parts of the world. In western societies, ideas of genital disappearance are relatively rare and not culturally bound, but are seen as isolated cases generally referred to as Koro-Like Syndrome, which can be co-morbid with psychiatric disorders or cerebral lesions. Koro-like symptoms may be more frequently occurring in cases of schizophrenia than previously reported. Koro, particularly cannabis-induced Koro, is not limited to eastern cultures. **Case Presentation:** A sporadic case is described in which Koro-Like Syndrome was diagnosed in an Egyptian man for whom the illness took a chronic course lasting more than three years. In contrast to an acute presentation with good prognosis and responsiveness to the treatment of the underlying co-morbid mental disorder, our case was of the chronic form. It appeared to be associated with schizophrenia and a chronic history of cannabis misuse. The patient's response to treatment of the underlying mental disorder was poor and his psychotic features became residual. **Conclusion:** Although, Koro is an acute condition, there is the possibility of it also manifesting as a chronic form of Koro-Like Syndrome among cases with co-morbid other mental disorder.

Keywords: Koro, culture-bound, genital retraction, anxiety, schizophrenia, cannabis misuse, Arab countries

Declaration of Interest: None

Introduction

Koro is a psychiatric illness characterized by acute anxiety accompanied by the belief that one's own penis (or vulva or nipples and breasts, in women) is shrinking and will dissolve in one's own abdomen and by the fear that, upon completion of this process, death will result.¹ Koro has been described as an acute illness. Studies describing Koro with a prolonged duration highlight the possibility of there being a chronic form.^{2,3} The ICD-10,⁴ lists Koro under other specified neurotic disorders or somatoform autonomic dysfunction of the genitourinary system. In the DSM-IV-TR,⁵ it is mentioned in the context of culture-bound syndromes. The diagnosis is included in the CCMD-2R⁶ and in The CCMD-3.⁷ In the DSM-5,⁸ Koro is under other specified Obsessive Compulsive and related disorders.

Traditionally, Koro has been regarded as a culture-bound syndrome.⁹⁻¹² It may manifest as an epidemic^{13,14} and

sporadic cases are also reported.¹⁵ It is possible to distinguish between primary Koro in either sporadic or epidemic form and secondary Koro, in which the presentation is co-morbid with Axis I disorders. Koro-Like Syndrome is not observed in healthy subjects, but as an unspecific syndrome related to other psychiatric disorders,¹⁶ such as anxiety disorders, depressive disorders, schizophrenia^{2,16-25} or somatic conditions, such as urological diseases, brain tumors and other neurological diseases.^{26,27} In fact, Koro has frequently been associated with body dysmorphic disorder (BDD),^{17,28-30} obsessive-compulsive spectrum disorders,³¹ somatoform disorder, panic disorder and/or sexual disorder not otherwise specified or a conversion reaction,^{26,32,33} low intellectual functioning,³⁴ paraphilia (voyeurism),³⁵ intoxication with cannabis or amphetamine^{27,36,37} and heroin withdrawal.³⁸ Garlipp¹² concluded that treatment attempts mostly target the underlying psychiatric disease. In certain cases, the use of antidepressants, especially Selective Serotonin Reuptake Inhibitors (SSRIs) have been successful. In cases with underlying psychotic diseases, antipsychotics

have been described as useful. ECT was also mentioned as successful in single cases.

Koro-Like Syndrome has been reported in different countries all over the world. There are few cases reported of Koro from Arab countries; a case from Sudan,³⁹ one from Saudi Arabia,⁴⁰ two cases from Jordan^{41,42} and a case from Oman.⁴³ The only epidemic reported in an Arab country was from Khartoum, Sudan⁴⁴ in 2003.

Case report

The current case report describes a 27 year old Egyptian, single man who presented to the outpatient psychiatric clinic at Suez Canal University complaining of extreme anxiety. He was a student in his final year in the Faculty of Art having stayed on for 10 years in the faculty. The patient had been doing well until his second year of study when he started to use cannabis. He continued to misuse the substance for the next five years and reported sometimes trying Tramadol as well as alcohol. The patient stopped abusing substances in his sixth year of study after he developed auditory hallucinations and began to isolate himself in one room at home in order to stop hearing voices. He had auditory hallucinations, delusions of reference, delusion of persecutions and delusions of loss of control because he thought others could read his thoughts. He experienced nihilistic delusions, which manifest as a belief that his penis would disappear. Three years prior to the study, the patient had been admitted to a mental hospital for 15 days after he hit his father and tried to kill his mother. This was while he was receiving ECT and antipsychotic medication. The patient received different antipsychotics without marked improvement.

Six months prior to the present study, he was prescribed a drug combination consisting of an antidepressant (Fluvoxamine: 50mg/day), antipsychotics (Risperidone: 4 mg/day) and Clozapine (300mg/day) gradually with repeated CBC, (Sulpride: 100mg/day) and a mood stabilizer (Valporic Acid: 500mg/day). After two months, he improved markedly in relation to his psychotic features and depression. However, he continued to have bouts of severe anxiety about his penis that prevented him from going to college despite wishing to do so. The patient tried to study at home as a result. He regained insight; his compliance with medications improved; and, he was motivated to overcome his abnormal thoughts.

Psychiatric examination revealed the following positive findings: intense anxiety attacks secondary to a fear that his penis was getting smaller and retracting into his body. He felt compelled to extract it himself and in the process believed he might die. The complaint was more frequent and more severe when in the gym, public places and on public transportation. He stayed home most of the time where the attacks were less frequent. The worrying thoughts associated with the belief about his penis led to him performing religious rituals. There were no other psychiatric manifestations apart from depressed mood. The results of physical examination, routine laboratory tests - including toxicology screening, brain computed tomography (CT) scan and electroencephalogram (EEG) - were all normal.

The patient is the only brother of two married sisters in a family living in Egypt's Ismailia Governorate. His father is described as a supportive man and his mother as an overprotective woman. It is understood that he enjoyed a normal childhood. He is described as shy, sensitive and polite. At the time of interview, he had yet to experience a romantic relationship. He started to masturbate at age 12 years, but expressed feeling ashamed about it. There was no history of sexual trauma or social anxiety disorder. He has no positive family history of psychiatric illness.

Discussion

A culture-bound syndrome is a collection of signs and symptoms restricted to a limited number of cultures.⁴⁵ Koro is classified as one of these syndromes and it has been observed mostly amongst Chinese where it can occur in both epidemic and sporadic forms.^{46,47} There have been many reports of its occurrence in non-Chinese subjects, which dilutes its primary identity as a culture-bound syndrome.⁴⁸⁻⁵¹

Our patient presented as a new case of Koro-Like Syndrome co-morbid with schizophrenia and history of cannabis abuse. Sporadic Koro has been reported to occur among patients with schizophrenia and cannabis abuse history.^{11,23,24,27,30} Despite the patient's drug history, the toxicology screening was negative, which likely was the case due to him having stopped any drug abuse for three years at the time of interview. Physical examination, routine laboratory tests and EEG revealed no signs of an organic disorder. Koro, particularly co-morbid with Axis I disorders, is not limited to Eastern cultures. Several factors may interact to create

symptoms. Abnormal body perception³⁰ and persecutory delusions^{32,33} are possible features in schizophrenia that can lead to an altered body image.

Our patient had a chronic case, supporting that sporadic Koro-Like Syndrome could be not a self-limited condition; our case is similar in this respect to the cases described in the existing literature.^{2,3} The possible reasons for chronicity are not clear.¹² Our case did not present with features that supported Koro as a culture-bound syndrome, e.g. he was from an Arab rather than a Far Eastern culture. The current study supports Al-Sinawi and colleagues,⁴³ who concluded that although the belief in ghosts and demons and in their power to manipulate and influence behaviors, including sexual potency, does exist in the Arab culture, these ghosts are not believed capable of taking away a person's genitals.

The current case report is the first to describe a case of Koro in Egypt although some cases in Arab patients have been described elsewhere.³⁹⁻⁴³

Further research is needed to understand the development of Koro-Like Syndrome related to schizophrenia. The issues concerning phenomenology, diagnosis and nosology of Koro are still being explored.⁵²⁻⁵³ The current case did not experience complete remission and it is concluded that treatment of sporadic Koro depends on its etiology and the effectiveness of antipsychotics in the control of the associated psychotic features.¹²

Conclusion

Findings from the current case study suggest that a more chronic form of Koro-Like Syndrome is possible in cases with co-morbid Axis I mental diagnoses.

Acknowledgement

Written consent was obtained from the patient's relative for publication of his details. Dr Ahmed Al-Arabi Hendi, Assistant Lecturer of Neuropsychiatry, Suez Canal University, Egypt contributed through follow up of the patient.

References

1. Adeniran RA, Jones JR. Koro Culture-Bound Disorder or Universal Symptom? *Br J Psychiatry*. 1994;164:559-561.
2. Chowdhury AN. Ethnomedical Concept of Heat and Cold in Koro: Study from Indian Patients. *World Cult Psychiatry Res Rev*. 2008;12:146-158.
3. Bandinelli PL, Trevisi M, Kotzalidis GD, Manfredi G, Rapinesi C, Ducci G. Chronic Koro-Like Syndrome (KLS) In Recurrent Depressive Disorder As A Variant of Cotard's Delusion In An Italian Male Patient. (A Case Report and Historical Review). *Riv Psychiatr*. 2011; 46(3):220-226.
4. World Health Organization. ICD-10 Classification of Mental and Behavioural Disorders. Diagnostic Criteria for Research. Geneva: WHO. Press:1993.
5. American Psychiatric Association. Diagnostic and Statistical Manual of mental disorders, Fourth Edition, Text Revision (DSM-IV-TR). Arlington, Virginia (Washington, District of Columbia): APA. Press:2000.
6. Chinese Medical Association. The Second Revised Edition of Chinese Classification of Mental Disorders (CCMD-2R). Nanjing, China, Dong Nan University: CMA. Press: 1995.
7. Chinese Medical Association. The Third Edition of Chinese Classification of Mental Disorders (CCMD-3), Chen Y (Ed). Beijing: Chinese Society of Psychiatry: CMA. Press: 2003.
8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. APA, Washington, DC Press: 2013.
9. Chowdhury AN. Dysmorphic Penis Image Perception: The Root of Koro Vulnerability. A Longitudinal Study. *Acta Psychiatr Scand*. 1989;80(5):518-520.
10. Chowdhury AN. Glans Penis Perception of Koro Patients. *Acta Psychiatr Scand*. 1993; 87(5):355-357.
11. Cheng ST. A Critical Review of Chinese Koro. *Cult Med Psychiat*. 1996; 20(1):67-82.
12. Garlipp P. Koro - A Culture-Bound Phenomenon. Intercultural Psychiatric Implications; *Ger J Psychiatry*. 2008;11:21-28.
13. Nandi DN, Banerjee G, Saha H, Boral GC. Epidemic Koro in West Bengal, India. *Int J Soc Psychiatry*. 1983;29(4):265-268.
14. Sachdev PS. Koro Epidemic in North East India. *Aust N Z J Psychiatry*. 1985;19(4):433-438.
15. Bartholomew RE. The Social Psychology of Epidemic Koro. *Int J Soc Psychiatry*. 1994;40(1):46-60.
16. Mather C. Accusations of Genital Theft: A Case from; Northern Ghana; Culture, Medicine and Psychiatry. *J World Cult Psychiatry Res Rev*. 2005;29:33-52.
17. Raven TF. Retraction of the Penis. *Lancet*. 1886;2:250.
18. Huaiyu Yang, Constantin Tranulis, Oliver Freudenreich. Keeping Culture-bound Syndromes in Cultural Context: The Case of Koro. *Int J Cult Ment Health*. 2009;2(2):86-91.
19. Earleywine M. Cannabis-Induced Koro in Americans. *Addiction*. 2001;96(11):1663-1666.
20. Hollander E, Liebowitz MR, Winchel R, Klumker A, Klein DF. Treatment of Body Dysmorphic Disorder with

- Serotonin Reuptake Blockers. *Am J Psychiatry*. 1989;146: 768-770.
21. Holden TJ. Koro Syndrome Associated with Alcohol-Induced Systemic Disease in a Zulu. *Br J Psychiatry*. 1987;151:695-697.
 22. Devan GS, Hong OS. Koro and Schizophrenia in Singapore. *Br J Psychiatry*. 1987;150:106-107.
 23. Afonso P, Saraiva, Gameiro Z. Schizophrenia Presenting With Koro-Like Symptoms. *J Neuropsychiatry Clin Neurosci*. 2013;25(1):E32.
 24. Ramirez-Bermudez J, Aguilar-Venegas LC, Crail-Meléndez D, Espinola-Nadurille M, Nente F, Méndez MF. Cotard Syndrome in Neurological and Psychiatric Patients. *J Neuropsychiatry Clin Neurosci*. 2010;22:409-416.
 25. Kobler F. Description of the Acute Castration Fear, Based on Superstition. *Psychoanal Rev*. 1948;(35):285-289.
 26. Kovács A, Osváth P. Genital Retraction Syndrome in Korean Woman. A Case of Koro in Hungary. *Hopathology*. 1998;31(4):220-224.
 27. Altable CR, Urrutia AR. Koro Misidentification Syndrome in Schizophrenia? A Plea for Clinical Psychopathology? *Psychopathology* 2004;37(5): 249-252.
 28. Stein DJ, Frenkel MF, Hollander E. (1991): Classification of Koro. (Letter to the Editor) *American Journal of Psychiatry* 1991;148(9): 1279-1280.
 29. Haggard P, Wolpert D. Disorders of Body Scheme in Higher-Order Motor Disorders: From Neuroanatomy and Neurobiology to Clinical Neurology. Edited by, Freund H, Jeannerod M, Hallett M, et al., Oxford, UK, Oxford University Press: 2005; pp 377-391.
 30. Hughes CC, Wintrob RM. Culture-bound Syndromes and The Cultural Context of Clinical Psychiatry. In: Oldham JM, Riba MB (Eds.), *Review of Psychiatry*. American Psychiatric Press, Washington, DC Press: 1995.
 31. Bentall RP, Kinderman P, Kaney S. The Self, Attributional Processes and Abnormal Beliefs: Towards A Model of Persecutory Delusions. *Behav Res Therapy*. 1994; 32: 331-41.
 32. Rosca-Rebaudengo P, Durst R, Minuchin-Itzigsohn S. Transculturation, Psychosis and Koro Symptoms. *Isr J Psychiat Relat Sci*. 1996; 33(1): 54-62.
 33. Chowdhury AN, Bera NK. Koro Following Cannabis Smoking: Two Case Reports. *Addiction*. 1994; 89 (8): 1017-1020.
 34. Srivastava M, Pandit B. Koro - A Case Report and Review. *International Journal of Physiology* 2013;1(1): 37.
 35. Stip E, Bergeron T, Laviguer C, et al. Le syndrome de Koro. *Ann Med Psychol*. 2007; 165:147-153. <http://www.em-consulte.com/article/60764/article/le-syndrome-de-koro>.
 36. Kalaitzi CK, Kalantzis A. Cannabis-Induced Koro-Like Syndrome. A Case Report and Mini Review. *Urol Int*. 2006; 76(3): 278-280.
 37. Chowdhury AN, Bagchi DJ. Koro in Heroin Withdrawal. *Journal of Psychoactive Drugs* 1993;25: 257-258.
 38. Parthasarathy R, Vikas M. Letter to The Editor: Koro Presenting As Acute and Transient Psychosis: Implications for Classification. *Asian Journal of Psychiatry* 2014;(10): 116-117.
 39. Baasher TA. The Influence of Culture on Psychiatric Manifestation. *Transcult Psychiatr Res Rev*. 1963;15: 51-52.
 40. Osman AA, Mahmood NS. Koro-Like Symptoms in Saudi Patients. *Arab Journal of Psychiatry* 1992;3(1).
 41. Al-Hmoud N. Koro-Like Syndrome in a Jordanian Male: Case Report. *East Mediterr Health J*. 1999;5(3): 611-613.
 42. Bayer RS. Koro-Like Symptoms and Transient Post-Ictal Psychosis. *Qatar Med J*. 2000;9(2):68-69.
 43. Al-Sinawi H, Al-Adawi S, Al-Guedi A. Ramadan Fasting Triggering Koro-Like Symptoms during Acute Alcohol Withdrawal: A Case Report from Oman. *Transcult Psychiatry*. 2008;45(4):695-704.
 44. MEMRI. Koro (Medicine); Panic in Khartoum: Foreigners Shake Hands, Make Penises Disappear, The Middle East Media Research Institute (MEMRI), Oct 2003, retrieved Jan 2010. [https://en.wikipedia.org/wiki/Koro_\(medicine\)](https://en.wikipedia.org/wiki/Koro_(medicine)).
 45. Prince H, Tchong-Laroche F. Culture-Bound Syndromes and International Disease Classifications. *Cult Med Psychiatry*. 1987;11:3-52.
 46. Gwee AL. Koro- A Culture Disease. *Singapore Med J*. 1963;4:119-122.
 47. Tseng WS, Mo KM, Li LS, Chen GQ, Ou LW, Zheng HB. Koro Epidemics in Gangdong China. *J Ner Ment Dis*. 1992;180(2):117-123.
 48. Lapierre YD. Koro in a French Canadian. *Can Psychiatr Assoc J*. 1972;17:333-334.
 49. Ang PC, Weller MPI. Koro and Psychosis. *Br J Psychiatry*. 1984;145:335.
 50. Borrios GE, Morely SJ. Koro-Like Symptoms in a Non-Chinese Subject. *Br J Psychiatry*. 1984;145:331-34.
 51. Ungvari GS, Mullen RS. Koro: The Delusion of Penile Retraction. *Urology* 1994;43: 883-885.
 52. Dzokoto VA, Adams G. Understanding Genital-Shrinking Epidemics in West Africa: Koro, juju or Mass Psychogenic Illness? *Cult Med Psychiatry*. 2005;29:53-78.
 53. Vaughan B. Koro: A Natural History of Penis Panics. *Kuro5hin*. AMEST. Press: 2002. <http://www.kuro5hin.org/story/2002/9/16/81843/6555> .

المخلص

المقدمة: تعد متلازمة كورو من المتلازمات المرتبطة بالبيئة وقد تم اكتشافها أولاً في جنوب شرق آسيا وأنها قد تحدث في صورة أوبئة في بعض المناطق. أما في المجتمعات الغربية فإن أفكار اختفاء الأعضاء التناسلية تكون نادرة وغير مرتبطة بالبيئة حيث أنها تحدث كحالات منفردة وتسمى متلازمة شبيهة كورو وتكون مصاحبة للاضطرابات النفسية أو لأمراض المخ. أعراض متشابهة كورو أكثر انتشاراً عما تم الاعلان عنه مع مضي الفصام وكما أنها وخصوصاً التي يحدثها تعاطي الحشيش ليست قاصرة على الثقافة الشرقية .

عرض الحالة: عرض حالة فردية من متلازمة شبيهة كورو في مريض مصري والذي يظهر فيه المتلازمة بصورة مزمنة لمدة تزيد عن ثلاثة سنوات. وعلى العكس من الحالات الحادة والتي تتميز بحسن المأل وتستجيب للعلاجات الموجهة للاضطراب النفسي المصاحب فإن هذا المريض هو من الشكل المزمن ومصاحب لاضطراب الفصام مع تاريخ سابق طويل من إساءة استخدام الحشيش وأن استجابته للعلاجات الموجهة لاضطراب الفصام ضعيفة حيث انه يوجد أعراض متبقية .

الخلاصة: على الرغم من أن متلازمة كورو تكون قصيرة الأمد الا أنه هناك احتمالية وجود أشكال مزمنة من متلازمة شبيهة كورو بين المرضى المصابين للاضطرابات النفسية الأخرى.

Corresponding author

Prof Dr Ashraf Mohamed Mohamed Ali El-Tantawy, Professor of Psychiatry, Department of Neuropsychiatry

Faculty of Medicine, Suez Canal University – Egypt Email: tantawy99@hotmail.com

قسمة الاشتراك

إتحاد الأطباء النفسانيين العرب

المجلة العربية للطب النفسي

الاسم: _____

العنوان البريدي: _____

البريد الإلكتروني: _____ هاتف: _____

الجنسية: _____ مكان وسنة التخرج: _____

العمل الحالي: _____

التاريخ: _____ التوقيع: _____

للأطباء النفسيين: اشتراك المجلة 25 دولاراً أمريكياً في السنة.

الاشتراك السنوي للمجلة لباقي الأفراد والمؤسسات 50 دولاراً أمريكياً في السنة.

ترسل القيمة بحوالة بنكية فقط على حساب رقم: 10-166055 البنك الأهلي الأردني – فرع جبل عمان /الأردن.

IBAN/JO40JONB0120000230101455066101

يعاد طلب الاشتراك على عنوان المجلة ص.ب 541212 عمان 111937 – الأردن.

التبرع _____ الاشتراك _____ المجموع _____

ملاحظة رقم الحوالة وتاريخها _____

The Arab Journal of Psychiatry

Subscription of Institutions and Individuals

Name: _____

Address: _____

Signature: _____ Date: _____

Annual Subscription fee 50 U.S. \$.

Money should be sent only by bank transfer to the account of the Journal No. 550661-01

National Jordan Bank, Jabal Amman Br. Amman-Jordan

IBAN/ JO40JONB0120000230101455066101

This form should be sent back to the journal P.O. Box (541212) Amman 11937 – Jordan.

Donatin _____ Subscription _____ Total _____

Note: Number and date of the bank transfer: _____

Tel: 0096265335446

Fax: 0096265349763

E- mail: wsarhan34@gmail.com

Website: <http://arabjournalpsychiatry.com/>