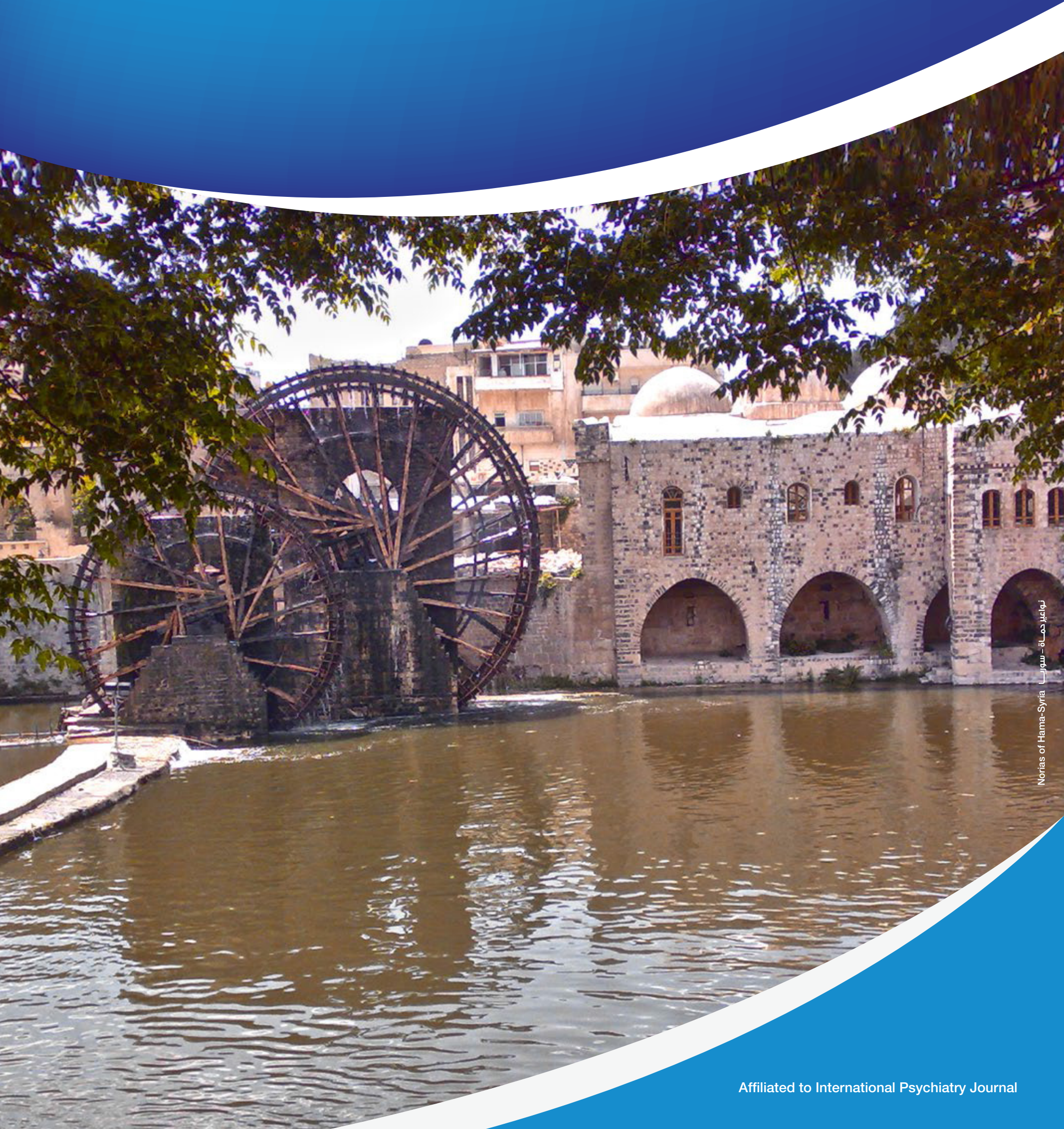




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Dear Reader:

I am pleased to present the most recent issue of the *Arab Journal of Psychiatry* (AJP). The publication is widely read across the Middle East and North Africa regions. Its readership extends beyond these regions to the international community providing an excellent showcase for research coming out of Egypt, Jordan, Iraq, Saudi Arabia, Bahrain and Palestine to name a few places. In the current edition, there are broad themes from Palestine concerning issues effecting adolescents and papers discussing unique research into schizophrenia. In the current edition, country reports feature Iraq and Palestine.

The issue also carries a photograph of Syria to remind readers of the importance of supporting the needs of people whose country has been torn by a conflict that has rendered so many to become internally and externally displaced.

Finally, I am writing to encourage all who support the AJP and enjoy the benefits derived from the research articles we publish, to actively help us identify further good quality articles and review papers for future editions. We are currently seeking referees who would be willing to give their time to assess article submissions and it would help enormously if further financial support could be identified. Despite difficult times, the journal continues to be produced through the generosity of those who give of their time and talent; it is with our thanks to them that journal remains viable. Please join us in supporting the AJP.

Walid Sarhan

November 2013

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Could Infection Effect Cognitive Function in Schizophrenia?

One Egyptian Center Study

Mohamed Adel El-Hadidy, Wafaa Elemshaty, Walaa Othman

هل يمكن للإصابة بالعدوى يمكن أن يؤثر علي الوظائف المعرفية للمخ في مرضي الفصام؟

دراسة مصرية في مركز طبي واحد.

محمد عادل الحديدي، وفاء الامشاتي، ولأء عثمان

Abstract

B **ackground:** Numerous viral infections, in utero or in childhood, have been associated with an increased risk of later developing schizophrenia. This may be explained by chronic infections or an altered immune status. **Objectives:** The present study aimed to measure levels of serum antibodies to some infectious agents in a sample of Egyptian patients with schizophrenia and to assess if there is correlation of cognitive functioning with this serum titer. **Methods:** the Arabic Version of Wechsler Adult Intelligence Scale Revised; selected subtests from Wechsler Memory Scale-Revised; Trail making test and Self-Assessment Scale of Cognitive Complaints in Schizophrenia were used to assess cognitive function in 102 newly diagnosed drug naïve patients with schizophrenia and 124 healthy matched individuals. Solid phase enzyme immuno-assay (EIA) techniques were used to measure IgG class antibodies to Rubella virus, cytomegalovirus (CMV), Herpes simplex virus type 1&2 (HSV-1&2), and to Toxoplasma gondii (T. gondii) in the sera of the study individuals. Associations between serological exposure to selected infectious agents and cognitive function in schizophrenia were evaluated. **Results:** All studied infectious agents were more prevalent in patients with schizophrenia than in the control group. Higher anti-HSV1&2, and anti-Rubella IgG antibodies titers were significantly correlated with impaired cognitive tests, while anti-T. gondii IgG titer was insignificantly correlated with any of the neuro-cognitive tests. **Conclusions:** The higher prevalence of serum IgG antibodies to all analyzed infectious agents with higher titers within patients with schizophrenia emphasizes a possible role of infectious agents in the etiopatho-genesis of schizophrenia. The data indicates that not one specific agent might be responsible for schizophrenic symptoms. Impairment of the cognitive functions in patients with schizophrenia was associated with higher IgG titers to HSV1&2, and Rubella virus.

Key words: Schizophrenia; infectious agents; cognitive functioning.

Declaration of interest: None

Introduction

Schizophrenia is a common, debilitating disorder characterized by disturbances in thought, perception, and cognitive function and effects that lead to significant deterioration in function with worldwide distribution that usually begins in young adulthood and has various degrees of severity. Some cases relapse and remit while others are continuously symptomatic. Many patients with schizophrenia exhibit clinical improvement in later years¹.

Significant epidemiologic data accumulated over the past years has established the role of environmental factors in the acquisition of neuropsychiatric disorders such as vitamin D deficiency² and complications during labor³. Viruses should be considered possible agents in all chronic central nervous system diseases of unknown etiology because of their potential for neurotropism and latency⁴. It is, therefore, not unusual to discover a body of evidence to indicate that infectious agents may play

some role in the etiology of schizophrenia. Some viruses have been shown to alter dopamine metabolism, thought to be altered in schizophrenia, and several antipsychotic and anti-manic drugs that are effective in treating serious mental illnesses, which have been shown to have antiviral properties both in vitro and in vivo.⁵ Patients with schizophrenia have an increased risk of infections as a result of hospitalizations or life style factors. Increased susceptibility to multiple pathogens in patients with schizophrenia, rather than a specific agent, may play a role in the etiology of schizophrenia.⁶ Moreover, infectious agents which can establish persistent or latent infections within the central nervous system represent potential environmental factors which could alter cognitive function in humans.^{7, 8, 9} This cognitive function is a core feature of schizophrenia.

Several studies had examined the antibody titers of cytomegalovirus (CMV), Herpes simplex virus (HSV), Epstein–Barr virus, Mycoplasma, Chlamydia, and Toxoplasma gondii in psychiatric patients and healthy

controls. There are conflicting reports concerning this association in humans.^{6, 10,11,12,13} Moreover, limited data are available about association of Rubella virus to this disorder.

The objectives of the present study were to determine differences in the prevalence and titre of serum antibodies to human Rubella virus, CMV, HSV-1&2 and *T. gondii* in Egyptian patients with schizophrenia in comparison to a healthy control group. Also, assess the correlation of cognitive functioning to the levels of antibodies to these infectious agents.

Subjects and methods

Study design and study population

A cross sectional survey study was done (one year duration, from 1st of November 2011 to 31 October 2012) for all newly diagnosed drug naive patients with schizophrenia (186 patients) coming to the psychiatric department at Mansoura University Hospital, Mansoura City, Egypt. At the end of the survey study only 102 patients with schizophrenia fulfilled inclusion and exclusion criteria for the present study. All patients were interviewed using the Clinician Version of the Structured Clinical Interview for DSM-IV (SCID-CV)¹⁴ and diagnosed clinically according to DSM-IV-TR.¹⁵ Moreover, 124 healthy volunteers were randomly selected (by their order of contact to Mansoura University Hospital Blood Bank and who agreed to participate in the study) from blood donors to be a control group. These subjects were matched to patients according to gender and age (every week we randomly selected control subjects with age and gender similar to patients with schizophrenia who had been selected in the previous week).

All patients with schizophrenia and healthy control subjects were included if they fulfilled inclusion and exclusion criteria. The inclusion criteria were: both genders; age range from 15-55 years old; newly diagnosed; never hospitalized and drug naive. Exclusion criteria was positive family history of schizophrenia or other psychotic disorders; substance use disorders; positive family history of dementia; evidence of immunodeficiency or other immunologic abnormalities; history of head trauma, previous meningitis/encephalitis, or brain surgery, and mental retardation (IQ<70) or other known systemic or neurological disease which could influence cognitive functioning.

The present study was reviewed and agreed by the Research Ethical Committee of Faculty of Medicine, Mansoura University, Egypt. All patients and control

group subjects gave their informed consent before the start of the study.

Study methods

Psychometric tests

To evaluate cognitive function, the Arabic Version of the Wechsler Adult Intelligence Scale Revised (WAIS-R)^{16,17} and selected subtests from the Wechsler Memory Scale-Revised (WMS-R)^{18, 19} were used. These subscales included Digit span subtest (forward and backward) which examines memory for digit span; logical memory subtest used to measure learning and memory; and, lastly a visual reproduction subtest. This selection was based on previous evidence of their usability for patients with schizophrenia patients in different studies. Moreover, the trail making test (Part A and Part B)^{20,21} which is a quick and easily-administrated test of visuo-motor tracking, conceptualization, and mental set shifting was used. Better cognitive function is associated with lower scores on the trail making test and higher scores on the WAIS-R and the WMS-R (digit span forward and backward, logical memory and visual reproduction).

Lastly, an Arabic test called the Self-Assessment Scale of Cognitive Complaints in Schizophrenia (SASCCS)²² was used, which is based on a questionnaire covering five cognitive domains that are the most frequently reported in the literature to be impaired in schizophrenia.^{23,24} The original test is in Tunisian Arabic, thus, some words in the test were less commonly used in Egyptian culture ; these words were changed to one more familiarly used in Egypt. The Egyptian version was evaluated by three professors of psychiatry in the Mansoura Faculty of Medicine to validate its use with an Egyptian population. The scale consisted of 21 questions dealing with memory, attention, executive function, language and praxia. Memory was evaluated through its components: working memory (item 1&2), episodic memory (item 3 through 9) and semantic memory (item 10&11).

Attention was investigated through its components: distractibility (item 12), alertness (item13), selective attention (item14), divided attention (item15) and sustained attention (item16). Executive functions were explored through their components: planning (item17), organization (item18) and flexibility (item19). Finally, language was examined through item 20 and praxia through item 21. The scale was made to be as clear, simple and easy to use by patients suffering from schizophrenia. The more the patient complained about cognitive impairments, the higher the total scale score.

Laboratory tests

Five mL of blood was obtained from each patient with schizophrenia and each healthy control. Serum samples were obtained by centrifugation of fresh whole blood from the patients and controls. The serum samples were frozen and kept stored at -20°C until analyzed. Anti-T. gondii IgG antibodies were detected by enzyme immunoassay 'Toxoplasma IgG' kit (Diagnostic Automation Inc., Calabasas, CA, USA). Sera with >50 IU/mL were considered positive. Anti-Rubella IgG antibodies were measured by ELISA kit (Diagnostic Automation Inc., Calabasas, CA, USA). The cutoff values of positive samples were >20 IU/mL. Anti-CMV IgG antibodies were screened by ELISA kit (Diagnostic Automation Inc., Calabasas, CA, USA) with positive samples >1.1 AU. Also, anti-HSV1&2IgG antibodies were done by enzyme immunoassay kit (Diagnostic Automation Inc., Calabasas, CA, USA) and cutoff values >1.1 AU. All tests were performed following the instructions of the manufacturer.

Statistical analysis

Parametric data were summarized as means and standard deviations; and the association differences were

compared using T-test. Nonparametric data were described as number and percentage; and the associated differences were compared using Chi-square test. SPSS software V.20.0 was used for statistical analysis.

Correlation was tested using Pearson moment correlation equation. Linear regression analysis was applied for prediction of schizophrenia diagnosis and cognitive impairment with infectious agents IgG titers.

Results

The prevalence rates and titers of serum IgG antibodies to Rubella virus, CMV, HSV1&2 and T. gondii were measured from 102 patients with schizophrenia and 124 healthy control. As shown in Table 1, the prevalence of positive IgG test were more for all infectious agents in patients with schizophrenia than in the control group; anti-Rubella virus IgG was detected in highest prevalence (98.0% to 88.7%) followed by anti-HSV1&2IgG, anti-CMV IgG and anti-T. gondii IgG (90.2% to 74.2%), (80.4% to 77.4%) and (54.9% to 27.4%), respectively.

Table 1. Prevalence rates of positive IgG antibodies to tested infectious agents in patients and control groups

Studied groups	Anti-Toxoplasma IgG	Anti-CMV IgG	Anti-Rubella virus IgG	Anti-HSV1&2IgG
Schizophrenic group (n=102)	56 (54.9%)	82 (80.4%)	100(98.0%)	92(90.2%)
Control group (n = 124)	34 (27.4%)	96(77.4%)	110(88.7%)	92(74.2%)
χ^2	17.639***	0.296	7.405**	9.472**
Odds Ratio (control/schizophrenia) confidence interval (lower-upper)	0.499 (0.357-0.699)	0.963(0.841-1.102)	0.905 (0.845-0.969)	0.823 (0.728-0.929)

*P value <0.05 ** P value <0.01 *** P value <0.001

There were statistically significant higher IgG seropositivity titers for all studied infectious agents in the group of patients with schizophrenia compared to healthy

control group. (Table 2). Moreover, Table 4 demonstrates that all infectious agents are predictors for schizophrenia except CMV.

Table 2. Comparison between IgG antibodies titers to tested infectious agents in schizophrenics and control groups

Studied groups	Anti-T. gondii IgG titer	Anti-CMV IgG titer	Anti-Rubella virus IgG titer	Anti-HSV1&2IgG titer
Group with Schizophrenia (n=102) mean \pm SD	228.61 \pm 311.1	2.83 \pm 2.23	816.9 \pm 588.99	2.8 \pm 1.5

Control group (n = 124) mean ±SD	35.48 ±44.94	1.9 ±1.07	163.7±138.4	1.49±0.0.98
T	-6.83***	-4.05***	-11.96***	-7.92***

*P value <0.05 ** P value <0.01 *** P value <0.001

Table 3 showed that anti-HSV1&2IgG antibody titer was indirectly correlated to the score of all studied psychological tests (except trail making test A and B, which were directly correlated) with statistically significant associations. Anti-Rubella virus IgG titer was indirectly correlated with intelligence (total, verbal and performance), digit span forward and backward; all

subscales of self-assessment scale of cognitive complaints in schizophrenia and directly with trail making test A. Anti-CMV IgG titer was indirectly correlated with visual respond and logic memory; memory and praxia subscale of self-assessment scale of cognitive complaints in schizophrenia and directly with trail making test part B.

Table 3. Correlation of cognitive functioning to the levels of antibodies to tested infectious agents

Psychometric tests		Pearson Correlation			
		T. gondii IgG titer	CMV IgG titer	Rubella virus IgG titer	HSV1&2I gG titer
Trail Making Test	Trail making test A	.078	.208	.208*	.861***
	Trail making Test B	.091	.244*	.141	.731***
Wechsler Memory Scale- Revised	Digit span backward	-.144	-.191	-.269**	-.808***
	Digit span forward	-.143	-.159	-.233*	-.796***
	Logic memory	-.091	-.251*	-.132	-.634***
	Visual respond	-.048	-.270*	-.079	-.704***
Wechsler Adult Intelligence Scale Revised	Verbal intelligence	-.128	-.078	-.201*	-.853***
	Performance intelligence	-.246	.078	-.322**	-.779***
	Total intelligence	-.196	-.012	-.271**	-.875***
Self- Assessment Scale of Cognitive Complaints in Schizophrenia (SASCCS)	Memory	-.043	-.207*	-.302**	-.807***
	Attention	-.041	-.189	-.267**	-.854***
	Executive function	-.013	-.176	-.322**	-.852***
	Language	-.003	-.174	-.298**	-.830***
	Praxia	.000	-.274**	-.285**	-.706***

*P value <0.05 ** P value <0.01 *** P value <0.001

On the other hand, there was a statistically non-significant association between any neuro-cognitive tests in patients group and serological titer of anti-T. gondii

IgG class (P > 0.05). Herpes simplex and Rubella IgG titer was a significant predictor for cognitive impairment (Table 4).

Table 4. Demonstrates the linear regressions between diagnosis and cognitive impairment as dependent variables to the levels of antibodies to tested infectious agents

Dependent Variable	diagnosis					cognitive impairment				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			B	Std. Error	Beta		
(Constant)	-0.012	0.049		-0.245	0.807	-0.176	0.041		-4.311	0.000
Toxoplasma IgG titer	0.000	0.000	0.203	3.877	0.000	-3.646E-005	0.000	-0.022	-0.390	0.697
CMV IgG Titer	0.020	0.014	0.071	1.385	0.167	-0.009	0.012	-0.039	-0.720	0.472
Rubella titer	0.000	0.000	.431	7.513	0.000	0.000	0.000	0.147	2.395	0.017
Herpes Simplex IgG titer	0.084	0.019	0.236	4.338	0.000	0.159	0.016	0.578	9.932	0.000

Discussion

As schizophrenia constitutes a number of heterogeneous symptoms, it seems more probable that infections might just be one contributing factor among others like genetic disposition.²⁵ The present study tested patients with schizophrenia in addition to unaffected controls for serum IgG antibodies to Rubella virus, CMV, HSV1&2 and *T. gondii*, since it has been suggested that such agents are involved in the patho-physiology of psychiatric disorders. The focus was on these agents, including their ability to establish persistent infections within the central nervous system as well as the occurrence of neurological and psychiatric symptoms in some individuals infected with these agents.^{26, 27} Herpes viruses (HSV-1 and HSV-2 and CMV) are neurotropic and known to infect the central nervous system, although only HSV-1, HSV-2 and CMV have been detected in the brain tissue of those with schizophrenia. *Toxoplasma gondii* is also capable of infecting the brain, but has not been detected in schizophrenia brain tissue.^{28,29}

The present study revealed that, the prevalence of positive IgG test was higher for all infectious agents in patients with schizophrenia than in control group. Also, there were statistically significant and higher IgG seropositivity titers for all studied infectious agents in the group of patients with schizophrenia compared to the healthy control group (Tables 1 and 2). From this result, it can be suggested that there is evidence that patients with schizophrenia have had more infections in the past and/or are suffering from a chronic infectious condition. We have seen IgG antibodies to be elevated in schizophrenia; this could indicate that the infections are not acute, but have progressed to dormant infections with a persistent immune response since IgG antibodies are

involved in secondary immune response and IgM antibodies appear early in the course of an infection.

Present study findings are consistent with those of Niebuhr et al.³⁰ who concluded that herpes family viruses represent one risk factor for schizophrenia. Also, in a study including 31 patients with schizophrenia, Krause et al.⁶ found that the studied group had a higher rate of positive antibodies to infectious agents, but a lower percentage than in our study and this could be attributed to a lower number of studied cases when compared to our study. Anti-HSV IgG was positive in 80.6%, anti-CMV IgG in 48.4% and anti-*T. gondii* IgG in 38.7%. A trend for significantly elevated positive antibody titers within patients with schizophrenia was found for herpes simplex virus ($P = 0.055$) when compared to controls. The finding of a strong association between anti-Rubella virus IgG antibodies and schizophrenia in this study is considered to be to an important finding given that limited data are available about this association.

Also, our findings are consistent with previous studies indicating an increased prevalence of antibodies to CMV in individuals with recent onset schizophrenia^{10, 12} and with a study showing that the anti-herpes drug valacyclovir can improve symptoms in individuals with schizophrenia who have antibodies to CMV.¹² Sero-positivity to HSV-1 related to cognitive deficits has been reported in adults with schizophrenia and antibodies to *T. gondii* prior to diagnosis in adults have also been associated with schizophrenia. Increased sero-positivity for CMV has also been observed at presentation in patients experiencing first-episode schizophrenia.^{31,32}

In the current study, we found that the serological evidence of exposure to HSV1&2 was most significantly associated with the impairment of all studied cognitive functioning in patients with schizophrenia ($P < 0.001$)

(Tables 3 and 4). In light of the biological properties of HSV-1 and the neuro-imaging studies, it is likely that the effect of HSV-1 on neuro-cognitive function is related to its ability to establish latency within the central nervous system and to undergo periodic reactivation. Individuals with schizophrenia may be at particular risk of the effects of HSV-1 infection due to underlying neuro-anatomical deficits, immune suppression or other environmental exposures and the effects of medications.^{33, 34, 35, 36} Shirts et al.³⁷ and Schretlen et al.³⁸ confirmed the association between HSV-1 infection and cognitive impairments in individuals with schizophrenia. Also, higher CMV and Rubella IgG antibodies titers, found in the present study, were directly correlated with impairment in some of cognitive functions (Table 3). Previous studies of adults with recent onset of schizophrenia have revealed that these patients have increased levels of serum IgG antibodies to CMV, which was linked to impaired cognitive functioning.^{26,33}

On the other hand, we did not find a statistically significant association between neurocognitive function in individuals with schizophrenia and serological titer of anti-T. gondii IgG antibody ($P > 0.05$) (Tables 3 and 4). This finding is consistent with those of previous studies by Dickerson et al.¹² and Shirts et al.³⁷ who found less association between cognitive function in individuals with schizophrenia and this protozoon. Conversely, Ledgerwood et al.³³, Leweke et al.²⁶ and Torrey and Yolken¹³ found that the patients with recent onset of schizophrenia had increased levels of serum IgG antibodies to T. gondii and was linked to the impairment in cognitive functioning.

Limitation of the study

The question of a possible role of neurotropic viral agents in genesis of non-schizophrenic psychiatric disorder was not discussed in this manuscript. Further research could consider the need for another control group from patients with non-schizophrenic disorder to complement these results. Moreover, the present study did not discuss non-schizophrenic brain tissue infections.

Conclusions

The higher prevalence of serum IgG antibodies to all analyzed infectious agents with high titers within patients with schizophrenia emphasizes a possible role of infectious agents in the etio-pathogenesis of schizophrenia. The data indicates there was not one specific agent that might be responsible for symptoms of schizophrenia. Impairment of the cognitive functions in people with schizophrenia was associated with higher

IgG titers to HSV1&2, and Rubella virus (but not T. gondii).

References

1. Yolken RH, Torrey EF. Viruses, schizophrenia, and bipolar disorder. *ClinMicrobiol Rev* 1995;8(1): 131-145.
2. McGrath J. Hypothesis: is low prenatal vitamin D a risk-modifying factor for schizophrenia? *Schizophr Res* 1999;40(3): 173-177.
3. Ashkanian M, Tehrani E, Videbech P. The effect of vitamin D on neuropsychiatric conditions. *UgeskrLaeger* 2010; 172(17): 1296-1300.
4. Specter S, Bendinelli M, Friedman M. Neuropathogenic viruses and immunity. Plenum, New York. 1992.
5. Kristiansen JE, Andersen LP, Vestergaard BF, Hvidberg EF Kristiansen. Effect of selected neuroleptic agents and stereo-isomeric analogues on virus and eukaryotic cells. *PharmacolToxicol* 1991;68(5): 399-403.
6. Krause D, Matz J, Weidinger E, Wagner J, Wildenauer A, Obermeier M, Riedel M, Müller N. The association of infectious agents and schizophrenia. *World J Biol Psychiatry* 2010;11(5): 739-743.
7. Dealberto MJ. Ethnic origin and increased risk for schizophrenia in immigrants to countries of recent and longstanding immigration. *ActaPsychiatr Scand* 2010; 121(5): 325-339.
8. Seltén JP, Cantor-Graae E. Hypothesis: social defeat is a risk factor for schizophrenia. *Br J Psychiatry Suppl* 2007; 51: s9-12. Erratum in: *Br J Psychiatry Suppl* 2008; 192(3): 234.
9. Yolken RH, Torrey EF, Lieberman JA, Yang S, Dickerson FB. Serological evidence of exposure to Herpes Simplex Virus type 1 is associated with cognitive deficits in the CATIE schizophrenia sample. *Schizophr Res* 2011;128(1-3): 61-65.
10. Dickerson F, Kirkpatrick B, Boronow J, Stallings C, Origoni A, Yolken R. Deficit schizophrenia: association with serum antibodies to cytomegalovirus. *Schizophr Bull* 2006;32(2): 396-400.
11. Dickerson FB, Boronow JJ, Stallings CR, Origoni AE, Cole S, Yolken RH. Association between cognitive functioning and employment status of persons with bipolar disorder. *Psychiatr Serv* 2004;55(1): 54-58.
12. Dickerson FB, Boronow JJ, Stallings CR, Origoni AE, Yolken RH. Reduction of symptoms by valacyclovir in cytomegalovirus-seropositive individuals with schizophrenia. *Am J Psychiatry* 2000;160(12): 2234-2236.
13. Torrey EF, Yolken RH. *Toxoplasma gondii* and Schizophrenia Synopsis Volume 9, Number 11—November 2003
14. First MB, Spitzer RL, Gibbon M, Williams, JBW. Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV). Washington, D.C.: American Psychiatric Press, Inc., 1996
15. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th Ed, Text

- Rev. Washington, DC: American Psychiatric Association. 2000.
16. Crawford J R, Allan KM, Stephen DW, Parker DM, Besson JAO. The Wechsler Adult Intelligence Scale—Revised (WAIS-R): Factor structure in a U.K. sample. 1989. *Person, individ. Diff.* Vol. 10, No. 11, pp. 1209-1212.
 17. Melika LK. The Wechsler Adult Intelligence Scale. Dar EL Nahda El Arabia; 1996.
 18. Wechsler D. Wechsler Memory Scale-Third Edition (WMS-III). San Antonio, TX: Psychological Corporation. 1987.
 19. Meguid MA, Moussa M. Cognitive Function in Hepatitis C Patients: Effect of Pegylated Interferon α and Ribavirin Therapy *Current Psychiatry* 2010; 17(2): 45-51
 20. Reitan RM. Trail making test. Manual for administration and scoring 1992. Tucson, AZ: Reiten Neuropsychological Laboratory.
 21. Elwan O, Hassan AAH, Naseer MA. Brain aging in a sample of normal Egyptians cognition, addiction and smoking. *Journal of Neurological Science* 1997;148: 79-86.
 22. Johnson I, Kebir O, Ben Azouz O, Dellagi L, Rabah Y, Tabbane K. The Self-Assessment Scale of Cognitive Complaints in Schizophrenia: A validation study in Tunisian population. *BMC Psychiatry* 2009; 9:66 doi: 10.1186/1471-244X-9-66.
 23. Keefe RS, Goldberg TE, Harvey PD, Gold JM, Poe MP, Coughenour L. The Brief Assessment of cognition in schizophrenia: reliability, sensitivity and comparison with a standard neurocognitive battery. *Schizophr Res* 2004;68: 283-297.
 24. Saykin AJ, Gur RC, Gur RE, Mozley PD, Mozley LH, Resnick SM, et al. Neuropsychological function in schizophrenia. Selective impairment in memory and learning. *Arch Gen Psychiatry* 1991;48: 618-624.
 25. Tomppo L, Hennah W, Lahermo P, Loukola A, Tuulio-Henriksson A, et al. Association between genes of disrupted in schizophrenia 1 (DISC1) interactors and schizophrenia supports the role of the DISC1 pathway in the etiology of major mental illnesses. *Biol Psychiatry* 2009;65(12): 1055-1062.
 26. Leweke FM, Gerth CW, Koethe D, Klosterkotter J, Ruslanova I, Krivogorsky B, et al. Antibodies to infectious agents in individuals with recent onset schizophrenia. *Eur Arch Psychiatry ClinNeurosci* 2004; 254: 4-8.
 27. Quinn JP, Dalziel RG, Nash AA. Herpes virus latency in sensory ganglia—a comparison with endogenous neuronal gene expression. *ProgNeurobiol* 2000;60:167-179.
 28. Conejero-Goldberg C, Torrey EF, Yolken RH. Herpesviruses and Toxoplasma gondii in orbital frontal cortex of psychiatric patients. *Schizophr Res* 2003; 60:65-69.
 29. Steiner I, Mador N, Reibstein I, Spivack JG, Fraser NW. Herpes simplex virus type 1 gene expression and reactivation of latent infection in the central nervous system. *NeuropatholApplNeurobiol* 1994;20: 253-260.
 30. Niebuhr DW, Millikan AM, Yolken R, Li Y, Weber NS. Results from a hypothesis generating case-control study: herpes family viruses and schizophrenia among military personnel. *Schizophr Bull* 2008;34: 1182-1188.
 31. Prasad KM, Shirts BH, Yolken RH, Keshavan MS, Nimgaonkar VL. Brain morphological changes associated with exposure to HSV1 in first-episode schizophrenia. *Mol Psychiatry* 2007;12 (1): 105-113.
 32. Torrey EF, Leweke MF, Schwarz MJ, Mueller N, Bachmann S, Schroeder J, et al. Cytomegalovirus and schizophrenia. *CNS Drugs* 2006;20: 879-885.
 33. Ledgerwood LG, Ewald PW, Cochran GM. Genes, germs, and schizophrenia: an evolutionary perspective. *PerspectBiol Med* 2003;46: 317-48.
 34. Strandberg TE, Pitkala K, Eerola J, Tilvis R, Tienari PJ. Interaction of herpesviridae, APOE gene, and education in cognitive impairment. *Neurobiol Aging* 2005; 26: 1001-1004.
 35. Nimgaonkar VL, Yolken RH. Neurotropic infectious agents and cognitive impairment in schizophrenia. *Schizophr Bull* 2012;38(6): 1135-6. doi: 10.1093/schbul/sbs125. epub 2012 Oct 31.
 36. Yolken R. Viruses and schizophrenia: a focus on herpes simplex virus. *Herpes* 2004; 11 (Suppl 2): 83A-88A.
 37. Shirts BH, Prasad KM, Pogue-Geile MF, Dickerson F, Yolken RH, Nimgaonkar VL. Antibodies to cytomegalovirus and Herpes Simplex Virus 1 associated with cognitive function in schizophrenia. *Schizophr Res* 2008;106(2–3): 268-274.
 38. Schretlen DJ, Vannorsdall TD, Winicki JM, Mushtaq Y, Hikida T, Sawa A, et al. Neuroanatomic and cognitive abnormalities related to herpes simplex virus type 1 in schizophrenia. *Schizophr Res* 2010;118(1–3): 224-231.

المخلص

هل يمكن للإصابة بالعدوى يمكن أن يؤثر على الوظائف المعرفية للمخ في مرضى الفصام؟ دراسة مصرية في مركز طبي واحد . على مدى العقود السابقة يظهر بوضوح تأثير العوامل المعدية على التسبب في الاضطرابات النفسية. و تعد العدوى قبل الولادة وبعدها من عوامل الخطر لمرض الفصام ويمكن تفسير ذلك من خلال العدوى المزمنة أو تغيير الوضع المناعي. ولذلك هدفت هذه الدراسة إلى تقييم مثل هذه الرابطة في المرضى المصريين المصابين بالفصام وكذلك تقييم ارتباط الوظائف المعرفية بمعدل انتشار ومستويات الأجسام المضادة في مصل الدم لبعض العوامل المعدية . شملت هذه الدراسة مجموعة من مرضى الفصام (102) بالإضافة الى مجموعة ضابطة (124) من الأفراد الأصحاء المتطابقة. وتم استخدام اختبارات الاليز القياس الأجسام المضادة من نوع اميونيوجلوبولين (ج) لفيروس الحصبة الألمانية، الفيروس المضخم للخلايا، فيروس الهربس البسيط 1,2 وطفيل التوكسوبلازما جوندياي في مصل الدم لأفراد الدراسة. وتم تقييم الارتباط بين التعرض للعوامل المعدية المختارة وبعض الاختبارات للوظائف المعرفية في المرضى المصابين بالفصام . أوضحت النتائج أن معدل انتشار الأجسام المضادة لكل الفيروسات و كذلك نسبة تركيزها في الدم كانت أكثر في مرضى الفصام بالمقارنة بالمجموعة الضابطة. وارتبطت المستويات العالية

للأجسام المضادة لكلا من فيروس الحصبة الألمانية وفيروس الهربس البسيط (1,2) مع ضعف في القدرات المعرفية طبقاً للاختبارات المستخدمة في هذه الدراسة. في حين أنه لم يتم اكتشاف أي ارتباط بين أي من الاختبارات المعرفية و مستوى الأجسام المضادة لطفيل التوكسوبلازما جوندياي. وقد خلصت هذه الدراسة الى ارتفاع معدل انتشار الأجسام المضادة من نوع اميونوجلوبيولين (ج) مع ارتفاع مستوياتها في مصل الدم لجميع العوامل المعدية المختارة بين مرضي الفصام عن الأصحاء. مما يؤكد على الدور الذي يمكن ان تكون تلعبه في التسبب في حدوث هذا المرض. وتشير النتائج إلى أنه لا يوجد عامل معدى واحد فقط هو المسئول عن أعراض هذا المرض. كما ارتبط انخفاض النتائج علي اختبارات الوظائف المعرفية في المرضى المصابين مع ارتفاع مستويات الأجسام المضادة لكلا من فيروس الحصبة الألمانية وفيروس الهربس البسيط (1,2).

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Self-Reported Quality of Life for People with Schizophrenia in a Psychiatric Outpatient Department in Saudi Arabia

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التبليغ الذاتي عن جودة الحياة للأشخاص المصابين بالفصام في قسم العيادات الخارجية النفسية في إحدى مستشفيات المملكة العربية السعودية

أميرة الشوكان، جانييت كيرتيز، إيفون وايت

Abstract

B **ackground:** Few studies have investigated the quality of life (QoL) for people with schizophrenia in Arab countries and none that solely studied QoL for people with schizophrenia in Saudi Arabia. **Aim:** To investigate the self-reported QoL and related socio-demographic factors for people with schizophrenia in Saudi Arabia. **Method:** A purposive sample was recruited from the Psychiatric Outpatient Department of King Fahd University Hospital (KFUH), Al-Khobar, Saudi Arabia in 2010. Structured face-to-face interviews were conducted using the Lancashire Quality of Life Profile–European Version. Data were analyzed with SPSS 17 software. **Results:** A total of 159 people participated in the study. The majority of the participants were male (61%), married (51.6%), and unemployed (54.7%). They had a mean age of 38.23 years. The main findings were that Saudi Arabian people with schizophrenia were mostly satisfied with their religion (82.2%), while they were dissatisfied with their leisure activities (25.2%), work (23.3%), and their financial status (24.5%). Women reported less satisfaction with their QoL than men. Unemployed people were less satisfied with their QoL than those employed. Married people were more satisfied with their QoL than single, divorced and widowed individuals; and people with low education were less satisfied with their QoL than those who had received higher education. **Conclusion:** The perception of QoL as reported by people with schizophrenia in Saudi Arabia will provide mental health services in Saudi Arabia more specific information. This information will contribute to the development of community based mental health services that emphasize effective management and better outcomes for people with schizophrenia.

Keywords: Quality of life, schizophrenia, Saudi Arabia, nursing, religion, stigma.

Declaration of interest: None.

Introduction

The influences of socio-demographic characteristics on the QoL for people with schizophrenia who are in a stable condition and live in the community have been studied by several researchers. Reported findings in regard to the association of socio-demographic characteristics and QoL, were inconsistent in regard to age, gender, and educational level. There was no relationship found between QoL and age¹; however some studies have reported such a relationship.^{2,3,4,5}

Reported relationships between gender and QoL have also been inconsistent, for example, Vandiver⁶ compared QoL by gender in Canada, Cuba, and the United States and reported a greater QoL and satisfaction with social relationships for females in Canada, the reverse in the Cuban sample, and no difference in the United States. Further, the QoL of males and females in Hong Kong were compared and reported no significant difference between the two in their psychological, social, and environmental aspects.⁷ However, the female gender was independently associated with poorer QoL than those of

males on physical items.⁸ While females with schizophrenia reported better QoL than males in some studies,^{8,9} Chan and Yu reported that women with schizophrenia in Hong Kong had low QoL and were less satisfied than males with life enjoyment, leisure, and personal safety. Similarly, women with schizophrenia in the United States⁴ and Spain² reported lower QoL than did males. Better QoL has been reported in people with schizophrenia with higher levels of education.^{4,11} Some studies have reported that high education was associated with lower QoL.¹² However, all studies reviewed concluded that being employed^{13,14,15} having a high income¹⁶, having social support, living with family, and being married were related to a better QoL.^{17,18}

It is unfortunate that there were only two studies of QoL reported by people with schizophrenia in the whole of the Arabic world. These studies were by a) Daradkeh and Al Habeeb,¹¹ which compared QoL in people with schizophrenia from Jordan and Saudi Arabia; and b) Zahid et al.,¹⁹ which measured QoL for people with schizophrenia and their relatives in Kuwait. To add to the knowledge base of self-reported QoL in those with

schizophrenia from Saudi Arabia a study was undertaken to investigate the relationship between QoL and socio-demographic characteristic for people with schizophrenia in Saudi Arabia, as this relationship is unclear from previous studies.

Aim

The aim of the present study was to investigate the QoL and related socio-demographic factors for people with schizophrenia in Saudi Arabia.

Method

Design

The design was a descriptive, quantitative study. The data were collected by structured face-to-face interviews and analyzed with SPSS 17 software.

Participants

The participants for the study were recruited from a single Mental Health outpatient facility in Saudi Arabia. The participant inclusion criteria were: Saudi Arabian citizens, ages 18 to 65 years, and meeting the DSM-IV – TR²⁰ diagnosis of schizophrenia. The patients were identified by a psychiatrist as being clinically stable. Exclusion criteria included patients diagnosed with comorbidities (such as alcohol and substance disorders, neurocognitive impairment such as dementia, and those with special needs).

To determine the sample size, a power analysis using G*Power,²¹ a stand-alone power analysis program for statistical tests, was conducted. The seven socio-demographic characteristics (age, gender, education, employment, income, living situation, and marital status) were used in a multiple regression equation. G*Power indicated that a minimum sample size of 103 was needed for a medium effect size for a power of 0.80 and an alpha of 0.05. A minimum sample size of 153 was needed for a medium effect size with a power of 0.95 and an alpha of 0.05. Therefore, a sample size of 159 was considered sufficient to undertake the study.

Data collection

The Lancashire Quality of Life Profile-European Version (LQoLP-EU) questionnaire²² was the data collection instrument. The data were collected between December 2009 and March 2010. The LQoLP-EU is a structured interviewer-administered questionnaire. The original LQoLP was developed by Oliver, Huxley, Bridges, and Mohamad²³ from Lehman's Quality of Life Interview (QoLI).^{24,25} It integrates various domains of life,

including those associated with subjective (patient's point of view including feelings, perceptions and concerns) and objective (observable and measurable data obtained through observation and assessment) concepts. The LQoLP and LQoLP-EU is a well-known instrument to measure QoL for people with schizophrenia and one of the most widely used instruments for the assessment of QoL in schizophrenia research.²⁶

The LQoLP-EU is comprised of 105 items, and it combines personal characteristics (age, gender, ethnic group, age on leaving full-time education), objective quality of life indicators (work/education, leisure activities, religion, finances, living situation, legal and safety, family relations, social relations, health), subjective quality of life indicators, and a global well-being measure.²⁷ Both objective and subjective indicators cover the nine life domains: (1) work and education; (2) participation in leisure activities; (3) religion; (4) finances; (5) living situation; (6) legal and safety; (7) family relations; (8) social relations; and (9) health. Each individual life domain contains a number of objective and subjective items. The objective components are composed largely of social and economic indicators and are evaluated on a scale of 'yes', 'no', or 'don't know'. However, the subjective components of these domains are assessed using a seven-point Likert scale, which is rated by the respondent, and is identified in the interview as the Life Satisfaction Scale (LSS), where a rating of 1 means 'cannot be worse' and 7 means 'cannot be better'.

For the purposes of the study, the researcher obtained permission to use LQoLP-EU and obtained the standardized Arabic translation from the Royal College of Psychiatrists. The Arabic translation of LQoLP-EU was reviewed by an expert Saudi Arabian panel for its applicability and validity to Saudi Arabian culture. As a result, minor modifications to the LQoLP-EU were made to suit the Saudi Arabian culture. Specific Muslim religious activities, including the frequency of monthly congregational prayers, were included. Community mental health services are not available in Saudi Arabia; therefore, the parts relating to community homes were deleted.

Participants who meet the study criteria were recommended by the chairperson of psychiatric department. Interviews of approximately 45 minutes in duration were conducted in Arabic to investigate the QoL for Saudi Arabian people with schizophrenia during a period of four months.

Ethical considerations

Ethics committee approval was obtained from University of Wollongong (Ethics Committee Approval Number HE09/236). In addition, ethics approval was granted by the ethics committee of a local hospital in Saudi Arabia, where the data were collected. A list of outpatients with schizophrenia who met the study inclusion criteria was obtained. A detailed description of the study—including the aim of the study, confidentiality, the right to withdraw—was explained to potential participants. Written consent was obtained from each participant before interview.

Data analysis

The LQoLP-EU manual²⁷ was used to compute the nine subjective domains as well as the total score of QoL. Statistical Package for Social Sciences (SPSS) for Windows Version 17 was used for data entry and analysis. Descriptive statistics, such as frequencies, percentage, mean values, and standard deviation (SD), were used to summarize the data. For the inferential statistics, ordinal regression was used to examine the association between socio-demographic characteristics and QoL. Ordinal regression was used because of the nature of the LQoLP-EU, which measured QoL on an ordered, categorical seven-point Likert scale: '1' 'can't be worse', '2' 'displeased', '3' 'mostly dissatisfied', '4' mixed, '5' 'mostly satisfied', '6' 'pleased', and '7' 'can't be better'.^{28,29}

Validity and reliability

A pilot study was undertaken to examine the psychometric properties of the amended Arabic version of the LQoLP-EU before data collection. A purposive sampling technique was employed for the pilot study at a psychiatric outpatient department. Fifteen people with schizophrenia agreed to participate and signed the consent form. The internal reliability of the amended Arabic version of the LQoLP-EU was examined using Cronbach's alpha coefficient for the life satisfaction scale (total score of QoL) and the nine life domains (work/education, leisure activities, religion, finances, living situation, legal/safety, family relations, social relations, and health). The Cronbach's alpha for the life satisfaction scale was very high (total score of QoL = 0.95). For the nine life domains, Cronbach's alpha ranged from 0.71 (work) to 0.96 (finance and social relations). The results indicated that the amended Arabic version of LQoLP-EU has very high internal consistency.^{30,31,32}

Results

Socio-demographic characteristics of the participants

The final sample comprised 159 participants. The mean (SD) age of the participants was 38.23 years (11.39). As seen in Table 1, the majority of the participants (61%) were male, 45.3% had a secondary school education, 51.6% were married, and 54.7% were unemployed. The majority of participants (50.9%) reported living with their parents, 62.9% owned their own house or live in a family-owned home, and 30.2% earned less than 2,500 Saudi Arabian Riyals (SAR) (\$677 AU) per month.

Quality of life

In the present study, the QoL for people with schizophrenia in Saudi Arabia was measured through the use of the LQoLP-EU.²⁷ The QoL was measured as a whole (total satisfaction score) and through the participants' satisfaction with nine life domains (work/education, leisure activities, religion, finance, living situations, legal and safety, family relations, social relations, and health).

Table 2 presents the descriptive statistics of the findings. Overall, the majority of participants (69.2%) reported feeling satisfied with their perceived QoL while 10.7% were not satisfied. Further analysis of the nine individual domains of the LQoLP-EU found that the majority of participants were satisfied with their work/education (63.5%), with leisure activities (55.3%), with their religion (82.4%), with their financial position (58.5%), with their living situation (72.3%), with their legal and safety situation (78.6%), with their family relationships (73.6%), with their social relationships (64.2%), and with their health (67.3%). Therefore, the domains with the highest level of satisfaction were religion, legal and safety, and family relations. Conversely, the domains that reported the lowest level of satisfaction were leisure, finance, and work/education.

Relationship between socio - demographic characteristics and quality of life

Ordinal regression was undertaken to examine the relationships between socio-demographic characteristics and the reported QoL for Saudi Arabian people with schizophrenia. The results of the ordinal regression analyses for socio-demographic characteristics and QoL are presented in Table 3.

From the observed p-value significance levels, it is clear that gender, education, employment, and marital status are all significantly related to QoL. The regression

coefficients of gender, education, and employment were negative, which indicates that females ($p = .002$) were less likely to assign a higher rating to QoL than males; people who are illiterate or with a primary education ($p = .043$) were less likely to assign higher rating to QoL than people with a university graduate education; and unemployed people ($p = .000$) were less likely to assign higher ratings to QoL than employed people. Finally, married people ($p = .006$) were likely to assign a higher rating to QoL than single, divorced, and widowed people.

Discussion

The findings of this study report Saudi Arabian people with schizophrenia were mostly male (with a mean age of 38.23 years), unemployed, married, and lived with their parents in a family-owned home. Similar socio-demographic characteristics were found in a study by Zahid et al.¹⁹ that studied the QoL for 130 people with schizophrenia through the use of the LQoLP-EU in Kuwait. Zahid et al.¹⁹ found that of the participants—mostly male with a mean age of 36.8 years—53.1% were unemployed, 26.9% were married, 50.8% lived with their parents, and 77.7% lived in their own houses. The similarities in these socio-demographic characteristics can be explained in that both Saudi Arabia and Kuwait share the same ethnic culture. In both countries, the main religion is Islam, the official language is Arabic, and the people's daily lives are structured by similar religious and social customs. In addition, both countries have a family core in which the traditional extended family is controlled by a male member. For example, EL-Islam³³ studied the pattern of care for 540 Arab outpatient with schizophrenia by their extended and nuclear families in Qatar. The result shows that extended family is more tolerant and protecting of their patient. In addition, extended family takes over controlling of the patient's medication, social adjustment, leisure participation and occupation. Therefore, a reasonable number of the participants were married and lived with their parents. Furthermore, Saudi Arabia and Kuwait are rich countries; therefore, most of the participants lived in houses owned by themselves, their parents, or their relatives.

In the this study, people with schizophrenia were more likely to be married, employed, and all of them were living with their families (partner, relative, or parents) in comparison with the people with schizophrenia in Denmark, Netherlands, Italy, Spain, and the United Kingdom³⁴ and the United States⁴. The possible explanation for the difference in the socio-demographic

characteristics of people with schizophrenia in Saudi Arabia, Europe, and the United States is that Saudi Arabia has a traditionally conservative culture; therefore, most of the participants were married and all lived within a family structure. In addition, the high unemployment rate among people with schizophrenia in Saudi Arabia can be explained in that people with mental illness in Saudi Arabia are financially supported by their families, and it is unusual for them to leave their family home to live by themselves. No comparisons were made between the monthly income of Saudi Arabian people in this study and people in other countries due to differences in their currency rates and standards of living.

Quality of Life

The results of this study showed that most Saudi Arabian people with schizophrenia were satisfied with their QoL. They were mostly satisfied with their religion, their legal and safety issues, and family relations. Similar results were found in four studies using either the LQoLP or LQoLP-EU to investigate the QoL for outpatients with schizophrenia in Kuwait,¹⁹ Sweden¹, Brazil³ and Denmark, Netherlands, Italy, Spain, and United Kingdom³⁴. For example, Zahid et al.¹⁹ studied the QoL for 130 people with schizophrenia and found that most participants were satisfied with their religion (84.1%), legal and safety issues (73.1%), and family relations (64.1%). Therefore, the high satisfaction with religion reported by Saudi Arabian people with schizophrenia might reflect the support that a belief in their religion provides to them.

There are possible explanations why Saudi Arabian people with schizophrenia are mostly satisfied with their religion. Three reasons can be offered: (1) religion helps people with mental illness manage and cope with their illness;^{35,36} For example, In the United States, Russinova, Wewiorski, and Cash³⁵ focused on people with severe mental illness and asked about the types of alternative healthcare practices they used. The study consisted of 40 people with schizophrenia, 70 people with bipolar disorder, and 39 people with major depression. The results showed that the most frequently reported practices that improved health were religious and spiritual activities, as 57.5% of the people with schizophrenia reported that the practices most beneficial to their mental health were religious and spiritual activities. (2) Religion is a source that provides hope, love, and life essence for people with mental illness;³⁷ and (3) religion is a vital source of support for people with mental illness through attending religious services.³⁸ ^{39, 40} Therefore, religion might function as a persistent,

potentially effective coping method for people with mental illness and serve as a salient method to improve the QoL for people with schizophrenia.

In this study, Saudi Arabian people with schizophrenia were mostly dissatisfied with their leisure activities, work, and financial status. Similar results were found in three studies using either the LQoLP or LQoLP-EU to investigate the QoL for outpatients with schizophrenia in Sweden,¹ Brazil,³ and Denmark, Netherlands, Italy, Spain, and United Kingdom.³⁴ The high level of dissatisfaction with leisure activities, work, and financial status of Saudi Arabian people with schizophrenia might reflect the attitude of the public toward people with mental illness, which may limit their engagement in leisure and work activities.

Possible explanations as to why Saudi Arabian people, with schizophrenia, were dissatisfied with their leisure activities, work and financial status. These are associated with the high level of discrimination and stigmatization of people with mental illness. The literature reviewed identified three main themes to explain these findings: (1) public fear and view of people with mental illness as dangerous,⁴¹ (2) lack of knowledge about people with mental illness,⁴² and (3) mental illness limiting the individual's ability to work.⁴³

Relationship between socio-demographic characteristics and quality of life

Saudi Arabian women in this study reported a lower QoL than did men. This lower QoL reported by Saudi Arabian women with schizophrenia can be attributed to (1) the expectation that women will study and work in occupations that are related to women only (e.g., teaching, nursing, and household activities), thereby limiting women's education and work opportunities;⁴⁴ (2) Saudi Arabian conservative religious beliefs might negatively affect the life of women; and (3) Saudi Arabian social norms, which limit women's participation in sporting activities, thereby affecting women's health.⁴⁵ Therefore, Saudi Arabia's local interpretation of Islamic laws and social norms lead to gender inequity in Saudi Arabia that has a negative impact on the health and wellbeing of women.

Further, participants in this study who were illiterate or had a very basic education reported a lower QoL than did those with a university or college education. The possible explanation for higher levels of education being associated with higher QoL is that people with mental illnesses who are well educated are more likely to hold

more highly skilled jobs. Working in such positions might provide an enthusiasm for maintaining employment and avoiding reliance on others.⁴⁶ In addition, because of this enthusiasm to maintain employment, the person might also be more likely to adhere to a medication and treatment regime for their illness, and therefore the individual's mental illness would be better controlled.

Unemployment was also found to be associated with lower QoL than was employment. The most probable explanation for unemployed people to be dissatisfied with their QoL is that unemployment affects a person's health,^{47,48} social life, and the ability to afford the expenses associated with daily living.¹⁰ Conversely, the employment of people with schizophrenia is associated with a better perceived health and QoL, which in turn would have a positive effect on their mental health status.

Those with schizophrenia who were married reported a better perceived QoL than those who were unmarried. This positive outcome can be attributed to marriage providing support to the patient through having a spouse; furthermore, having children would provide a reason for the patient to build social relationships not available to single individuals.^{49,50} In addition, Saudi Arabia is a traditional culture where the emphasis on marriage and having children is very strong. Thus, married people with schizophrenia have better family and social support and therefore better QoL.

Study limitations

Although the present study reveals significant findings, there are important limitations that should be addressed. One limitation in this study included participants who were patients receiving outpatient clinic treatment and in a stable mental health condition. Therefore, the findings might not be generalized to people with schizophrenia who are institutionalized in psychiatric hospitals, clinically unstable, or are experiencing severe psychotic symptoms. Because an assessment of QoL in those people where their mental health is not stable would not be able to assess their QoL due to disrupted thought patterns. A further limitation of this study is that the findings of the study may not be generalized to the general population of people with schizophrenia, because of the purposeful sampling (i.e., Saudi Arabian people with schizophrenia receiving outpatient treatment at only one facility). The final limitation was the cross-sectional design by which data were collected at a single point in

time. QoL is a dynamic construct and may change from day to day based on life conditions at the time of assessment.

Recommendations

The findings from this study suggest that religion might work as a significant and salient method to cope with mental illness which can improve the QoL of people with schizophrenia. Therefore, conducting qualitative and longitudinal studies regarding religion/spirituality and their relationship to QoL will promote a comprehensive understanding of the effect of religion on QoL. If a positive impact for religion is defined then this may influence the planning of mental health services, in Saudi Arabia through giving more importance to religious and spiritual activities and beliefs in planning.

The stigmatization of people with mental illness in Saudi Arabia needs to be addressed pro-actively. This study reports that Saudi Arabian people with schizophrenia encounter many problems. Aside from their mental health issues, they had problems with leisure, work, and finances, which serve as barriers to improving their QoL. Therefore, strategies to de-stigmatize people with schizophrenia in Saudi Arabia should be implemented. Carr and Halpin⁵¹ have suggested a number of such strategies, namely, (1) providing public health education and community awareness about mental illness; (2) engaging people with mental illness in the community; and (3) providing patients and their families with psycho-education.

Females face cultural restrictions in the Arab world and particularly in Saudi Arabia, aside from their role in taking care of children and other family members. Women-specific mental health services in Saudi Arabia should be implemented. This study reported that Saudi Arabia women with schizophrenia report poorer QoL than men. They also face cultural restrictions. Therefore, it is important to lobby the Saudi Arabian Government for mental health services which focus on women only. Such services have been described by Seeman and Cohen⁵² and implemented in Australia and in Canada^{53,54} showing favorable results.

Mental health nurses can play a very important role in the assessment, evaluation, and improvement of QoL. Mental health nursing curricula need to focus on how to improve the patients' QoL in addition to controlling disease symptoms. The reported perceived QoL of individuals has been reported as being strongly associated with morbidity and mortality. In addition,

mental health nursing curricula need to focus on the role of community mental health nurses in planning and running financial, employment, leisure, family, and social support programs for people with schizophrenia who are mentally stable. This would promote the integration of those with a mental illness into their communities, and reduce the stigma associated with their illness.

Community mental health services in Saudi Arabia should be developed and implemented as a matter of priority. It is important to note that such services have not yet been established in Saudi Arabia.⁵⁵ It is argued that the creation of such community mental health services is crucial for people with schizophrenia to decrease the rate of hospitalizations and improve their QoL. Programs of community mental health services should be tailored according to the needs of those people, focusing on their work/education, marital status, and social relationships. Lehman, Ward, and Linn²⁴ suggested a number of strategies to improve the QoL for people with mental illness, including offering financial support, providing vocational preparation programs, granting employment chances, facilitating integration into the community, and affording protection against crime. These strategies can be achieved through the establishment of community mental health services in Saudi Arabia.

Conclusion

Women, unemployed, unmarried, and less-educated people with schizophrenia in Saudi Arabia report a lower QoL. Whilst the present study has reported some significant findings and has therefore added to the repository of knowledge in relation to self-reported QoL in those with schizophrenia, there is still room for further evaluation of the components of QoL through research. The findings of this study provide information to healthcare decision-makers and healthcare providers which can assist in the development and implementation of better services for those with schizophrenia.

References

1. Bengtsson-Tops A, Hansson L. Subjective quality of life in schizophrenic patients living in the community Relationship to clinical and social characteristics. *Eur Psychiat* 1999; 14: 256-63.
2. Duno R, Pousa E, Domenech C, Diez A, Ruiz A, Guillamat R. Subjective quality of life in schizophrenic outpatients in a Catalan urban site. *J Nerv Ment Dis* 2001; 189(10): 685-90.

3. De Souza LA, Coutinho ESF. The quality of life of people with schizophrenia living in community in Rio de Janeiro, Brazil. *Soc Psych Psych Epid* 2006; 41(5): 347-56.
4. Narvaez JM, Twamley EW McKibbin RK, Heaton RK, Patterson, TL. Subjective and objective quality of life in schizophrenia. *Schizophr Res* 2008; 98: 201-208.
5. Browne S, Roe M, Lane A, Gervin M, Morris M, Kinsella A, Larkin C, Ocallaghan E. Quality of life in schizophrenia: relationship to sociodemographic factors, symptomatology and tardive dyskinesia. *Acta Psychiat Scand* 1996; 94(2): 118-24.
6. Vandiver VL. Quality of life and schizophrenia: a cross-national survey in Canada and USA. *Community Ment Hlt J* 1998; 34: 501-511.
7. Xiang YT, Weng YZ, Leung CM, Tang WK, Chan S, Wang CY, Han B, Ungvari GS. Gender differences in sociodemographic and clinical characteristic and the quality of life in Chinese schizophrenia patients *Aust N Z J Psychiatry* 2010; 44: 450-455.
8. Salokangas RKR, Honkonen T, Stengard E, Koivisto AM. To be or not to be married - that is the question of quality of life in men with schizophrenia. *Soc Psych Psych Epid* 2001; 36(8): 381-90.
9. Caron J, Mercier C, Diaz, P, Martin A. Socio-demographic and clinical predictors of quality of life in patients with schizophrenia or schizoaffective disorder. *Schizophr Res* 2005; 137(3): 203-13.
10. Chan S, Yu IW. Quality of life of clients with schizophrenia. *J Adv Nurs*, 2004; 45(1): 72-83.
11. Daradkeh TK, Al Habeeb T. Quality of life of patients with schizophrenia 2. *East Mediterr Health J* 2005; 11(5-6): 898-04.
12. Caron J, Lecomte Y, Stip E, Renaud S. Predictors of quality of life in schizophrenia. *Community Ment Hlt J* 2005a;41(4): 399-17
13. Priebe S, Warner R, Hubschmid T, Eckle I. Employment, attitudes toward work, and quality of life among people with schizophrenia in three countries. *Schizophrenia Bull* 1998; 24 (3): 469-77.
14. Bryson G, Lysaker P, Bell M. Quality of life benefits of paid work activity in schizophrenia. *Schizophr Bull* 2002; 28(2): 249-257.
15. Adewuya AO, Makanjola ROA. Subjective quality of life of Nigerian schizophrenia patients: sociodemographic and clinical correlates. *Acta Psychiat Scand* 2009; 120 (2): 160-164.
16. Cardoso, CS, Caiaffa, WT, Siqueira, AL, Abreu, MN, Fonseca, JO. Factors associated with low quality of life in schizophrenia. *Cad Saude Publica* 2005; 21(2): 1338-1348.
17. Hansson L, Middelboe T, Sorgaard KW, Bengtsson-Tops A, Bjarnason O, Merinder L, Nilsson L, Sandlund M, Korkeila J, Vinding HR. Living situation, subjective quality of life and social network among individuals with schizophrenia living in community settings. *Acta Psychiat Scand* 2002; 106(5): 343-50.
18. Mubarak AR, Baba I, Chin LH, Hoe QS. Quality of life of community-based chronic schizophrenia patients in Penang, Malaysia. *Aust N Z J Psychiatry* 2003; 37(5): 577-585.
19. Zahid MA, Ohaeri JU, Elshazly AS, Basiouny MA, Hamoda HM, Varghese R. Correlates of quality of life in an Arab schizophrenia sample. *Soc Psychiatry Psychiatr Epidemiol* 2009; 45(9): 875-887.
20. American Psychiatric Association. Diagnostic and statistical manual of mental disorder: DSM-IV-TR: Washington DC: American Psychiatric Association; 2000.
21. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods* 2007; 39(2): 175-191.
22. Gaite L, Vazquez-Barquero JL, Borra C, Ballesteros J, Schene A, Welcher B, Thornicroft G, et al. A. Quality of life in patients with schizophrenia in five European countries: the EPSILON study. *Acta Psychiat Scand* 2002; 105(4): 283-292.
23. Oliver J, Huxley P, Bridges K, Mohamad H. Quality of life and mental health services. London: Routledge; 1996.
24. Lehman AF, Ward NC, Linn LS. Chronic mental patients - the quality of life issue. *Am J Psychiat* 1982; 139(10): 1271-1276.
25. Lehman A. The effects of psychiatric symptoms on quality of life assessments among chronic mentally ill. *Eval Program Plann* 1983; 6: 143-151.
26. Van Nieuwenhuizen C, Schene A, Koeter WJ, Huxley P. The Lancashire quality of life profile: modification and psychometric evaluation. *Soc Psych Psych Epid* 2001; 36: 36-44
27. Thornicroft G, Becker T, Knapp M, Knudsen H, Schene A, Tansella M, Vazquez-Barquero JL. International outcome measures in mental health: quality of life, needs, service satisfaction, costs and

- impact on carers, London; The Royal College of Psychiatrists: 2006.
28. Chan SHW, Yeung FKC. Path models of quality of life among people with schizophrenia living in the community in Hong Kong. *Community Ment Hlt J* 2008; 44(2): 97-112.
29. SPSS, Inc. Ordinal regression analysis. IL: Chicago: 2008
30. Burns N, Grove S. The practice of nursing research: conduct, critique, and utilization. 5th ed. Missouri: Elsevier; 2005
31. George D, Mallery P, SPSS for Windows step by step: A simple guide and reference, 4th ed. Boston: Allyn & Bacon; 2003.
32. Polit DF, Beck CT. Nursing research: generating and assessing evidence for nursing practice, 8th ed. Philadelphia: Williams & Wilkins; 2008.
33. EL-Islam M.F. Rehabilitation of schizophrenics by the extended family. *Act Psychiat Scand* 1982; 65(2): 112-119.
34. Gaite L, Vazquez-Barquero JL, Borra C, Ballesteros J, Schene A, Welcher B, Thornicroft G, Becker T, Ruggeri M, Herran A. Quality of life in patients with schizophrenia in five European countries: the EPSILON study. *Acta Psychiat Scand* 2002; 105(4): 283-292.
35. Russinova Z, Wewiorski NJ, Cash D. Use of alternative health care practices by persons with serious mental illness: perceived benefits. *Am J Public Health N* 2001; 92: 1600-1603.
36. D'Souza R. Do patients expect psychiatrists to be interested in spiritual issues? *Australas Psychiatry* 2002; 10: 44-47.
37. Mohr S, Brandt P, Borrás L, Gillieron C, Huguelet P. Toward an integration of spirituality and religiousness into the psychosocial dimension of schizophrenia. *Am J Psychiat* 2006; 163: 1952-1959.
38. Corrigan P, McCorkle B, Schell B, Kidder, K. Religion and spirituality in the lives of people with serious mental illness. *Community Ment Hlt J* 2003; 39(6): 487-499.
39. Borrás L, Mohr S, Brandt P, Gillieron C, Eytan A, Huguelet P. Religious beliefs in schizophrenia: their relevance for adherence to treatment. *Schizophrenia Bull* 2007; 33(5): 1238-1246.
40. Bellamy CD, Jarrett NC, Mowbray O, MacFartane P, Mowbray CT, Holter MC. Relevance of spirituality for people with mental illness attending consumer-centered services. *Psychiatr Rehabil J* 2007; 30(4): 287-294.
41. Bener A, Ghuloum S. Gender differences in the knowledge, attitude and practice towards mental health illness in a rapidly developing Arab society. *Int J Soc Psychiatr* 2010; 10: 1177/0020764010374415.
42. Al-Adawi S, Dorvlo AS, Al-Ismaily S, Al-Ghafry D, Al-Noobi B, Al-Salmi A, et al. Perception of attitude towards mental illness in Oman. *Int J Soc Psychiatr* 2007; 48(4): 305-317.
43. Scheid, TL Stigma as a barrier to employment: mental disability and the Americans with Disabilities Act. *Int J Law Psychiat* 2005; 28: 670-690.
44. Al-Jarf RS. Unemployed female translators in Saudi Arabia: causes and solutions. *Translator J*; 44(2): 391-397.
45. Al-Nozha MM, Al-Mazrou YY, Al-Maatouq MA, Arafah MR, Khalil MZ, Khan NB, et al. Obesity in Saudi Arabia. *Saudi Med J* 2005; 44 (5): 824-829.
46. Mechanic D, Bilder, S, McAlpine DD. Employing persons with serious mental illness. *Health Affair* 2002; 21(5): 242-253.
47. Bejerholm U. Relationships between occupational engagement and status of and satisfaction with sociodemographic factors in a group of people with schizophrenia. *Scand J Occup Ther* 2010; 61: 21-32.
48. Bejerholm U, Eklund M. Occupational engagement in persons with schizophrenia: relationships to self-related variables, psychopathology, and quality of life. *Am J Occup Ther* 2007; 61: 21-31.
49. Melle I, Friis S, Hauff E, Vaglum P. Social functioning of patients with schizophrenia in high-income welfare societies', *Psychiatric Services* 2000; 51: 223-228.
50. Shapiro A, Keyes, CLM. Marital status and social well-being: are the married always better off? *Social Indic Res* 2008; 88: 329-346.
51. Carr VJ, Halpin SA. Low prevalence disorder component of the national study of mental health and wellbeing bulletin 6: stigma and discrimination. Canberra; 2002.
52. Seeman MV, Cohen R. Focus on Women: a service for women with schizophrenia. *Psychiatr Serv* 1998; 49: 674-677.
53. Monash Alfred Psychiatry Research Centre. Women's Mental Health Clinic; Retrieved 6/1/2011.
54. Psychiatric Disability Services of Victoria. Victorian women & mental health network. Retrieved 6 /1/2011.

55. Al-Habeeb AA, Qureshi NA. Mental and social health atlas I in Saudi Arabia. Int J Soc Psychiatr 2007; 16(5): 570-577.

الملخص

مقدمة: عدد قليل من الدراسات قامت بدراسة جودة الحياة لدى الأشخاص المصابين بالفصام في الدول العربية و لكن ليس هناك دراسة قامت بدراسة جودة الحياة لدى الأشخاص المصابين بالفصام في المملكة العربية السعودية بشكل خاص. الأهداف: دراسة جودة الحياة المبلغ عنها ذاتيا و العوامل الديموغرافية ذات الصلة للأشخاص المصابين بالفصام في المملكة العربية السعودية. **الطريقة:** تم اختيار عينة مقصودة من الأشخاص المصابين بالفصام من قسم العيادات الخارجية النفسية في إحدى مستشفيات المملكة العربية السعودية في عام 2010. وقد أجريت مقابلات شخصية باستخدام استبيان لانكشير لجودة الحياة -النسخة الاوربية. و قد تم تحليل البيانات باستخدام برنامج الاحصاء SPSS النسخة 17. **النتائج:** العدد الاجمالي للأشخاص المصابين بالفصام الذين شاركوا في البحث هو 159. وكانت غالبية المشاركين من الذكور (61%)، عدد الأشخاص المتزوجين (51.6%)، والعاطلين عن العمل (54.7%). وقد كان لديهم متوسط عمر 38.23 عاما. وكانت النتائج الرئيسية أن الأشخاص المصابين بالفصام في المملكة العربية السعودية راضين في الغالب عن دينهم (82.2%)، في حين انهم غير راضين عن أنشطتهم الترفيهية (25.2%)، والعمل (23.3%)، وضعهم المالي (24.5%). وقد أفادت النساء بأنهم أقل رضا بجودة حياتهم بالمقارنة مع الرجال. الأشخاص العاطلين عن العمل أقل رضا بجودة حياتهم بالمقارنة مع العاملين، والمتزوجين أكثر ارتياحا من الأشخاص الغير متزوجين، وكان الناس ذوي التعليم المنخفض أقل رضا بجودة حياتهم من أولئك الذين تلقوا التعليم العالي. **الخلاصة:** إن إدراك جودة الحياة للأشخاص المصابين بالفصام في المملكة العربية السعودية سوف تزود خدمات الصحة النفسية في المملكة العربية السعودية بالمزيد من المعلومات. وسوف تسهم هذه المعلومات في تطوير خدمات الصحة النفسية المجتمعية التي تركز على الإدارة الفعالة وتحقيق نتائج أفضل للأشخاص المصابين بالفصام.

كلمات البحث: جودة الحياة، الفصام، المملكة العربية السعودية، التمريض، الدين، وصمة العار

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Quality of Life among Caregivers of Patients with Schizophrenia in Erbil, Iraq

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تقييم نوعية الحياة لدى رعاة مرضى الفصام في أربيل، العراق

رسول صبري بيرو ، توانا عبدالرحمن رحيم

Abstract

Objectives: The present study aimed to evaluate factors influencing the quality of life among caregivers of patients suffering from schizophrenia. **Methods:** A cross-sectional study was performed to assess patient and caregiver factors influencing the quality of life of 100 caregivers of patients with schizophrenia who attended the psychiatric outpatient clinic at Hawler teaching hospital during the period of 15th of July to 15th of October 2012. The study adopted the World Health Organization Quality of Life (WHOQOL-BREF) questionnaire to assess caregivers' quality of life domains (Physical, Psychological, Social and Environmental). **Results:** The mean scores of the WHOQOL-BREF in physical, psychological, social and environmental domains were 53.03, 52.91, 59.25, and 47.40 consecutively. Younger and employed caregivers had a better physical quality of life. Male and single status predicted better psychological quality of life. Second degree relatives in addition to shorter illness duration were associated with better social quality of life. Furthermore, better financial income predicts better quality of life across all domains. **Conclusion:** Several factors determine the quality of life among caregivers of patients with schizophrenia. Understanding quality of life of caregivers is crucial to improve the quality of care to patients with the condition.

Key Words: Schizophrenia, quality of life, caregivers

Declaration of Interest: None

Introduction

Schizophrenia is a severe psychiatric disorder that typically presents with communication impairment, speech disturbance, disturbances of thoughts, probably reality detachment and sometimes delusion and hallucination.¹ Individuals with schizophrenia might face multiple relapses and an alternating pattern of partial or total symptom remission, which subsequently demands appropriate care from family caregivers.²

At the present time, family caregivers have assumed duties and tasks, which were delivered in the past by psychiatric institutions. This change exposes relatives of patients and family caregivers to a great burden.³ In Asian cultures (countries where family support plays an important role in the life of individuals), most individuals with long-term psychiatric disorders live with their families. For instance in China, more than 90% of individuals with schizophrenia reside with their family members.⁴

Past studies have shown that burden on relatives of schizophrenic patients is associated with noticeable reduction in their quality of life, the caregiver's health condition and subsequently can diminish the caregiver's quality of life.⁵ Additionally, families of patients with schizophrenia endure higher economic burden, disturbed work routines, feelings of loss and grief, elevated stress levels, and may be stigmatized for having a family

member with schizophrenia.⁶ Moreover, they may experience difficulties in managing bizarre behaviors and mood swings, insufficient time for personal enjoyment, leisure activities and social engagement, and lack of motivation in other areas.⁷

Hence, assessing caregivers' QOL is as important as patients' well-being assessment. By constantly assessing the QOL of caregivers and the factors affecting it, interventions can be devised to preserve the QOL of family caregivers so that their quality of care is improved.

Kurdish families, in parallel to their neighbors, suffer from lack of proper health services, particularly mental health services. Consequently, one might expect their sufferings to be much higher than other, more developed, countries. This study examines the QOL profiles among caregivers of patients with schizophrenia and compares the profiles according to their socio-demographic variables as well as some characteristics of patients with schizophrenia.

The objectives of the current study are to:

1. Assess QOL among caregivers of patients with schizophrenia across the domains (physical, psychological, social relationship and environment).
2. Determine the association between QOL of caregivers and their socio-demographical

characteristics such as (age, gender, occupation, education, residency, and economic status).

3. Investigate potential links between QOL of caregivers and patient characteristics.

Method

Settings

The present study was conducted in the psychiatric outpatient clinic of Hawler teaching hospital which is the largest teaching public health sector that provided both in- and out-patients mental health services in Erbil at the time the study was conducted.

Participants

Inclusion criteria for caregivers were as follows: the caregiver should have at least one registered family member with schizophrenia in the hospital's outpatient clinic. In addition, the caregiver has to be identified by the patient with schizophrenia as the main caregiver. Finally, it was required that patients experience a minimum of one year of illness for their caregivers to be recruited into the current study. The American Psychiatric Association (APA) in its fourth edition of Diagnostic and Statistical Manual of Mental Disorder (DSM-IV-TR) applied a minimum of six months duration for the diagnosis of schizophrenia when the rest of the signs and symptoms are present.⁸ We added an additional six months, i.e. a total of one year, in order to assess longer term burden(s), if any, on caregivers QOLs. To avoid possible confounding burdens on QOL, patients suffering from other concurrent chronic disabling medical conditions, such as a stroke, epilepsy, or other serious medical condition, were excluded. The study was reviewed and agreed centrally by the Ethics Committee of the Hawler Medical University.

A non-probability (Purposive) sample of 110 patients with schizophrenia who fulfilled the inclusion criteria was approached.

Procedure

We identified consecutive patients in the psychiatric outpatient clinic of Hawler teaching hospital who received the diagnosis of schizophrenia during the last three months before data collection. Prior written informed consent was obtained from each participant with emphases on anonymity and confidentiality of all information provided by them.

As an initial step, we confirmed the diagnosis of schizophrenia by re-interviewing each patient through Mini International Neuropsychiatric Interview (M.I.N.I.6.0.0) chapter K: Psychotic Disorders and Mood Disorder with Psychotic Features^{9,12}. Each patient was required to introduce his/her main caregiver. Then the main caregiver was contacted and an appointment was arranged for the evaluation. Each caregiver, subsequently, was assessed individually in a private booth through direct (face to face) interview.

For each caregiver, socio-demographic characteristics (e.g. age, gender, years of education, profession, marital status, family income, number of family members 'family size' and the residential area) and his/her patient's characteristics (age, gender, duration of illness, compliance with drug) were recorded.

The family income was categorized to be sufficient or not depending on the participant's judgment. Medication compliance was assessed through asking three questions: (1) Does the patient accept the treatment modality? (2) Does the patient comply with the therapy prescribed by his/her therapist? And (3) Does the patient received the prescription regularly? Any negative response to one of the above questions was judged to be non-adherence to therapy.

Following this procedure, the caregiver's QOL was assessed using the World Health Organization Quality of Life (WHOQOL-BREF) Questionnaire. In this study the WHOQOL-BREF, which is derived from the parent WHOQOL-100, was applied. WHOQOL-100 assessment has been undergoing development since 1991.¹³ WHOQOL instruments are available in over 20 different languages.¹⁴

The WHOQOL-BREF questionnaire consists of 26-item across four domains: physical health, psychological health, social relationships, and environment. The physical domain assesses physical health and disability. The psychological domain focuses on feelings, mood, body image and mental activities. The social domain estimates the social and sexual relationships as well as how much supports one perceives from the surrounding social venue. The environmental domain, however, measures how far the individual is able to be integrated with and interacted to his/her milieu.

The WHOQOL-BREF was designed for both self-administration and interview.¹⁵ The instrument was developed to assess the QOL of both ill and healthy populations.¹⁶ The questionnaire has been validated across different cultures. The WHOQOL-BREF showed good to excellent psychometric properties of reliability and performed well in preliminary tests of validity.¹⁷

Statistical analysis

By adopting the Statistical Package for Social Science, version 19.0 (SPSS Inc, Chicago, IL, USA), simultaneous multiple regression analysis (MR) was conducted to assess the coefficient (B) associations of all variables together with the QOL of caregivers. For each MR, 95% confidence interval (CI) was adjusted, and prior Correlation Matrices and Collinearity Diagnostics were considered to obtain more accurate results.

Results

Among the 110 caregivers who were approached, seven declined to participate and three dropped out before study completion. One hundred (91%) candidates consented to participate. As seen in Table 1, more than half of caregivers were parents; 19% were siblings; 15% were spouses; 5% were sons or daughters, and only 5% were second degree relatives of patients. Mean age of caregivers was 48.2 years old, for which 78% were female and 22% were male. The majority of caregivers were illiterate with a mean of only 2.36 years of formal education; 76% were unemployed at the time of conducting our study. (Table-1)

Table 1. Characteristics of caregivers

		Total = 100
Caregivers N (%)	Parents	56
	Siblings	19
	Spouse	15
	Children	5
	Second degree relatives	5
Age (M(SD))		(48.2 ± 13.7)
Gender N (%)	Male	22
	Female	78
Years of formal education (M(SD))		(2.36 ± 3.71)
Employment N (%)	Governmental	16
	Self employed	5
	Non-governmental	3
	Unemployed	76
Residency N (%)	Urban	70
	Rural	30
Financial status N (%)	Sufficient	45
	Insufficient	55

Table 2 shows that the mean age of the patients with

schizophrenia was 37.03 years; 66% were male and the mean duration of the illness was 13.7 years.

Table 2. Characteristics of patients

		Total = 100
Age (M(SD))		(37.03 ± 11.95)
Gender N (%)	Male	67
	Female	33
Duration of illness (M(SD))		(13.66 ± 9.13)
Adherence to therapy	Yes	82

N (%)	No	18
Family history of mental disorders	Yes	20
N (%)	No	80

Table 3 shows that the scores of QOL domains are spread out around half of scores, when the highest score recorded was 59.25 for social QOL

Table 3. Mean score and standard deviation of domains of QOL ^{a, b}

QOL Domains	M(SD)
Physical	53.03 (17.37)
Psychological	52.91 (15.20)
Social	59.25 (21.18)
Environmental	47.40 (12.09)

^a The measures of the domains transformed to (0-100) scale

^b Higher means represent better QOL

Multiple Regression Analyses:

In order to achieve a better understanding of contributing

factors to QOL, we examined the effects of each variable on the QOL through analyzing all factors together. Table 4 displays each domain of QOL in turn, taking all variables regressed altogether in a complex Multiple Regression Analyses.

Multiple regression was conducted to determine the best linear combination of testing variables in predicting physical, psychological, social and environmental QOLs. The models significantly predicted all QOL domains as follows: $F(17, 82) = 2.805, p < 0.05$; $F(17, 82) = 2.410, p < 0.05$; $F(17, 82) = 1.99, p < 0.05$; and $F(17, 82) = 2.451, p < 0.05$ respectively. The model suggests that younger age and higher financial status contributed to better physical QOL, being male and single with a higher income contributes to better psychological QOL, whereas siblings and second degree relatives caregivers as well as caring patients with lower duration of illness predicts better social QOL. Only family income significantly contributed to better environmental QOL. (Table 4)

Table 4. Domains of caregiver quality of life related to caregiver and patient characteristics (N=100)

	Physical ^a	Psychological ^b	Social ^c	Environment ^d
Caregiver Characteristics	Beta	Beta	Beta	Beta
Relationship to patient				
Siblings	-.007	.086	.434*	.070
Spouse	-.004	-.156	.001	-.218
Children	.176	.011	.234	-.074
Second degree relatives	.027	.070	.406*	.005
Gender of Caregiver	-.159	-.282*	-.092	.008
Age of caregiver	-.391*	-.043	.290	-.091
Total years of formal education of caregiver	.097	-.108	.194	.088
Occupation of caregiver	-.001	-.092	-.143	-.200
Family size	-.060	-.034	-.068	.004
Marital status	.011	-.252*	.160	.203
Residential area	.041	.096	.126	-.114
Family income	.257*	.367**	-.026	.411*

Patient characteristics				
Age of patient	-.188	-.042	.038	.229
Gender of patient	-.088	-.087	-.061	-.114
Duration of illness	.18	.104	-.270	.071
Having another family member with mental illness	.122	-.068	-.052*	-.120
Adherence to therapy	.123	.091	.007	.067

^a $R^2 = 0.37$; $F(17, 82) = 2.805$ ^b $R^2 = 0.33$; $F(17, 82) = 2.410$ ^c $R^2 = 0.29$; $F(17, 82) = 1.99$ ^d $R^2 = 0.34$; $F(17, 82) = 2.451$

* $P \leq 0.05$ ** $P \leq 0.01$

Discussion

To the authors' best knowledge, the current study is the first attempt to tackle the QOL of caregivers of patients with schizophrenia in Iraq. Overall, the study revealed that mean scores of different QOL domains of caregivers supporting someone with schizophrenia was distributed around 50 out of a scale of 100 (Table 3).

Additionally, our findings suggest that younger and wealthier caregivers have the advantage of better overall physical QOL (Table 4). Li et al. in a stepwise regression analysis found that higher household income significantly predicted better QOL in all domains including physical domain.¹⁸ Interestingly, Boyer et al. in multivariate analysis confirmed that increasing caregivers' age was a predictor of poorer physical QOL.¹⁹

Income security means having enough money to afford the essentials of life such as food, housing, clothing, education and all the other things needed to ensure health and well-being. Income is one of the most important determinants of physical well-being. This finding is consistent with that of Johnson and Krueger.²⁰ With respect to the impact of age, it is not surprising that getting elder contributes to lower physical QOL. Many studies support this claim. For instance, Heithold and Stephen²¹ found aging produces many physiological changes in the body as well as increasing the risk for diseases. They included obesity, a sedentary lifestyle, high cholesterol, hypertension and diabetes.

Concerning psychological QOL, the present study indicated that male, single status, and more affluent caregivers predicted better psychological QOL. Li et al. also found higher income to be predictive of better psychological QOL.¹⁸ Equally, Taylor et al.²² found low income to have significant psychological costs.

In terms of gender, four large surveys in the USA reported women to suffer from higher levels of distress than men and were more likely to perceive having a psychological problem than men who in similar situations.²³ In terms of higher psychological QOL in

single individuals, this might be due to a lower subjective burden for single caregivers as compared to married caregivers. Married caregivers simultaneously deal with two issues; first, household duties and possibly child rearing; and second, tasks which are related to care giving roles. When it comes to the social domain of QOL, our analysis confirmed that being a sibling or second degree relative caregiver supporting shorter duration of illness in patients was predictive of higher social scores. These findings are consistent with those of ZamZam et al.²⁴

The impact of stigma on the family may be lower for second degree relatives and, to a lesser extent, also siblings when compared to spouses and parents. Buizzaa et al.²⁵ found that schizophrenia significantly stigmatized all family members of patient and that the closer the relation to the patient the greater the impact of stigma.

Finally, regarding the environmental QOL, our study showed that only caregivers with more disposable incomes were privileged for better environmental QOL. This finding is consistent with that of Li et al.¹⁸ where higher income was found to be a predictor of better environmental QOL.

Taking into account all the above mentioned factors together, it is noticeable that financial income possibly marginalized other factors. Financial income was a key contributing factor for improving the QOL of caregivers supporting those with schizophrenia. It is undoubtedly true that being wealthier probably grants the affordability of better health services, as well as, in some instances, securing 'by-proxy' caregiving arrangements for the family a someone with schizophrenia. This is alongside opportunities to improve one's QOL through the availability of higher-level pursuits, such as traveling, vacations and more qualitative leisure activities.

Limitations of the study

The researchers acknowledged the following limitations:

1. There was insufficient documentation on individuals with schizophrenia/caregivers who

had at least one referral to the psychiatric outpatient clinic of Hawler teaching hospital.

2. Our findings may not be generalizable due to the limited sample size.
3. The study was a hospital-based, cross-sectional survey. Future, more elaborative community-based longitudinal studies are recommended to address parallel questions.
4. Comparative analysis with control groups was not conducted in order to assess the extent to which QOL of caregivers of patients with schizophrenia might differ from a general population.
5. Finally, clinical subtypes and the severity of schizophrenia were not considered although these can influence the burden on caregivers.

References

1. George, M. *Mental Health and Psychiatric Nursing* 2nd edition. India: A.I.T.B.S. Publishers, 2009.
2. Herz MI, Lamberti JS, Mintz J, et al. A program for relapse prevention in schizophrenia: a controlled study. *Arch Gen Psychiat* 2000; 57(3): 277–283. TDNet Tour [Context Link]
3. Caqueo-Úrizar A, Gutiérrez-Maldonado J, Miranda-Castillo C. Quality of life in caregivers of patients with schizophrenia: A literature review. *Health Qual Life Outcomes* 2009;7: 84-7. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/doi:10.1186/1477-7525-7-84>. [accessed on 2012 Sep 25]
4. Michael R, Phillips L, Yongyunli T, Scott S, Lihuaxin M. Causes of schizophrenia reported by patients' family members in China. *The British Journal of Psychiatry* 2000;177: 20-25.
5. Gutiérrez-Maldonado J, Caqueo-Úrizar A, Kavanagh D. Burden of care and general health in families of patients with schizophrenia. *Soc Psychiatry Psychiatr Epidemiol* 2005;40: 899-904.
6. Martens L, Addington J. The psychological well-being of family members of individuals with schizophrenia. *Soc Psych Epid* 2001; 36(3): 128–133.
7. Sales E. Family burden and quality of life. *Quality of Life Res* 2003;12: 33-41.
8. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, DC, American Psychiatric Association, 2000.
9. Sheehan DV, Lecrubier Y, Harnett-Sheehan K, Amorim P, Janavs J, Weiller E, et al. The Mini International Neuropsychiatric Interview (M.I.N.I.): The Development and Validation of a Structured Diagnostic Psychiatric Interview. *J. Clin Psychiatry* 1998;59(suppl 20): 22-33.
10. Sheehan DV, Lecrubier Y, Harnett-Sheehan K, Janavs J, Weiller E, Bonara LI, et al. Reliability and Validity of the MINI International Neuropsychiatric Interview (M.I.N.I.): According to the SCID-P. *European Psychiatry* 1997;12: 232-241.
11. Lecrubier Y, Sheehan D, Weiller E, Amorim P, Bonara I, Sheehan K, et al. The MINI International Neuropsychiatric Interview (M.I.N.I.) A Short Diagnostic Structured Interview: Reliability and Validity According to the CIDI. *European Psychiatry* 1997;12: 224-231.
12. Amorim P, Lecrubier Y, Weiller E, Hergueta T, Sheehan D: DSM-III-R Psychotic Disorders: procedural validity of the Mini International Neuropsychiatric Interview (M.I.N.I.). Concordance and causes for discordance with the CIDI. *European Psychiatry* 1998;13: 26-34.
13. Kuyken W, Orley J. WHOQOL Measuring Quality of Life. Program on Mental Health 1999. www.who.int/mental_health/media/68.pdf (accessed on 2 Sep 2012).
14. World Health Organization. WHOQOL Measuring Quality of Life. Geneva. The Organization 1997. www.who.int/mental_health/media/68.pdf (accessed on 14 Oct 2012).
15. World Health Organization. Quality of Life (WHOQOL) Study. Australian WHOQOL-100, WHO-BREF and CA-WHOQOL instruments User's Manual and Interpretation Guide. Melbourne; the Organization 2000. www.psychiatry.unimelb.edu.au/whoqol/instruments (accessed on 14 Oct 2012)
16. Feck MP, Berlim MT. 'Quality of life': a brand new concept for research and practice in psychiatry. *Brazilian Journal of Psychiatry* 2003;25(4): 249-252.
17. Skevington SM, Lotfy M, O'Connell K. WHO Centre for the Study of Quality of Life. Department of Psychology, University of Bath, Bath, Department of Mental Health and Substance Dependence. World Health Organization, Geneva, Switzerland. 2004. www.pain-initiative-un.org. (accessed on 22 Sep 2012).
18. Li J, Lambert CE, Lambert VA. Predictors of family caregivers' burden and quality of life when providing care for a family member with schizophrenia in the People's Republic of China. *Nurs Health Sci* 2007;9(3): 192-8.
19. Boyer L., Caqueo-Úrizar A, Richieri R, Lancon C, Gutiérrez-Maldonado J, Auquier P. Quality of life among caregivers of patients with schizophrenia: a cross-cultural comparison of Chilean and French families. *BMC Family Practice* 2012. <http://www.biomedcentral.com/doi:10.1186> (accessed on 2012 Oct 28).
20. Johnson W, Krueger RF. Higher perceived life control decreases genetic variance in physical health: Evidence from a national twin study. *Journal of Personality & Social Psychology* 2005;88(1): 165-173.
21. Heithold K, Stephen, C. Variations in heart rate and perception of effort during land and water aerobics in older women. *JEP* 2002; 5(4): 22-28. www.asep.org/asep (Cited 2012 Dec 2).

22. Taylor M, Jenkins S, Sacker A. Financial capability, income and psychological wellbeing 2011; 201:18. www.iser.essex.ac.uk/publications. (accessed 12 Dec 2012).
23. World Health Organization. Gender and Mental Health 2002. www.who.int/gender/other_health/en/gendermh.pdf (accessed on 18 Dec 2012).
24. ZamZam R, Midin M, Hooi LS, Yi EJ, Ahmad SN, Azman SF, et al. Schizophrenia in Malaysian families: A study on factors associated with quality of life of primary family caregivers. *Int J Ment Health Syst* 2011; 5(1):16. [www.ncbi.nlm.nih.gov/doi:10.1186/\[1752-4458-5-16\]](http://www.ncbi.nlm.nih.gov/doi:10.1186/[1752-4458-5-16]). (accessed 20 Oct 2012).
25. Buizza C, Schulze B, Bertocchi E, Rossi G, et al. The stigma of schizophrenia from patients' and relatives' view: A pilot study in an Italian rehabilitation residential care unit 2007. www.ncbi.nlm.nih.gov. (Cited on 2012 Dec 22).

الملخص

الأهداف: هدفت هذه الدراسة الى توضيح العوامل التي تؤثر على نوعية الحياة لدى رعاة مرضى الفصام. **الطرق:** تم تقييم عينة مقطعية لرعاة مائة من مرضى الفصام الذين زاروا العيادة الخارجية في مستشفى هولير التعليمي بين 15 تموز الى 15 تشرين الأول لسنة 2012، وذلك باستخدام مقياس ال- WHOQOL (BREF) لمنظمة الصحة العالمية المعني بتقييم نوعية الحياة ضمن المجالات التالية: الفيزيائي، النفسي، الاجتماعي، وكذلك البيئي. **النتائج:** أظهرت الدراسة بأن معدل نوعية الحياة لدى رعاة مرضى الفصام في المجالات: الفيزيائي، النفسي، الاجتماعي، و البيئي يساوي 53,03 ، 52,91 ، 59,25 ، و 47,4 عالتوالي. تمتعت الرعاية الأصغر عمرا والعاملون بمعدل نوعية حياة فيزيائي أفضل. الرعاية الذكور والغير متزوجون نالوا معدل نوعية حياة نفسي أعلى، بينما نالت الرعاية ذوي الدرجة الثانية من القرابة للمريض و كذلك الذين كانوا يهتمون بمرضى شخصوا حديثا نسبيا بأعلى معدل نوعية حياة اجتماعي. و أخيرا، كان للثراء المالي تأثير ايجابي على شتى مجالات نوعية الحياة. **الاستنتاجات:** هنالك عدة عوامل تحدد نوعية الحياة لدى رعاة مرضى الفصام. دراسة و فهم نوعية الحياة لدى رعاة مرضى الفصام جوهريان لتحسين نوعية الرعاية للمرضى أنفسهم .

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Resilience and Psychological Problems among Palestinians Victims of Community Violence

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المشاكل النفسية لدى الفلسطينيين ضحايا العنف المجتمعي وعلاقتها بالصمود النفسي

انور العبادسة، عبدالعزيز موسى ثابت

Abstract

Aim: The present study examined the relationship between psychological problems in families' of victims of community violence and resilience in the Gaza Strip. **Method:** 255 participants were selected; 120 were males (47.1%) and 135 were females (52.9%). Participants were interviewed using a socio-demographic scale and Arabic versions of the Symptom Checklist-90-Revised and the Resilience Attitude Scale. **Results:** Participants' mean psychological symptoms were 121.48. Females reported more somatization, obsessive compulsive, anxiety and phobic anxiety symptoms than males. Hostility was greater in low income families, paranoia was greater in people from moderate income families, psychosis was greater in those from low income families. While mean resilience was 60.84, males had more resilience than females, were more committed, more able to control, and more challenging than females. People living in north Gaza were less resilient and less challenging than people living in Gaza or Khan Younis. Psychological problems, obsessive compulsive, depression, anxiety, phobic anxiety, paranoia, and psychosis were correlated negatively with resilience. Also, total psychological problems, sensitivity, and phobic anxiety were correlated negatively with commitment. Sensitivity, anxiety and phobic anxiety were negatively correlated with control. With total psychological problems, obsessive compulsive, sensitivity, depression, anxiety, paranoia and psychosis were correlated negatively with challenge. **Conclusion:** Palestinians in the Gaza Strip reported more psychological problems due to long-standing stress and trauma arising from community violence. Resilience was an outcome of experiences of stress and trauma and coping strategies; social support was affected by the presence of psychological problems among Palestinians whereby people with more psychological problems showed less resilience. This study highlights the need for community reconciliation between the factions and increased effort in social reconciliation. More psychoeducational programs may help increase coping and resilience. Also, families affected directly by such community violence should be targeted with their children by programs including psychological intervention, social and community support group, stress management, and parenting training.

Keywords: Community violence, psychological problems, resilience, Gaza Strip

Declaration of interest: None.

Introduction

Palestinians in the Gaza Strip have been victims of political violence from the last decades. In 2005, Israeli military forces left the Gaza Strip which called for unilateral Israeli withdrawal. In 2006, after Hamas' legislative victories this has continued, politically and sometimes militarily, up to this day. The community conflict, which erupted between the two main Palestinian parties, Fatah and Hamas, resulted in the split of the Palestinian Authority into two parties. However, both parties see themselves as the true representatives of the Palestinian people – the Fatah ruled Palestinian National Authority in the West Bank and the Hamas Government in the Gaza Strip.

In early June 2007, another wave of community violence erupted. Gunfire and rocket propelled grenades could be heard from the streets of Gaza Strip. Within six months, more than 150 Palestinians were killed in factional

fighting between Fatah and Hamas sparking fear of a civil war in the Gaza Strip. Another round of community fighting erupted from 10 June until 14 June 2007. Across the four days of fighting, people in the Gaza Strip experienced different types of traumatic events, e.g. mainly hearing gunfire sounds in the street, witnessing killing of relatives and neighbors, watching people being wounded and killed on television, and being personally injured. Hamas had taken control of the Gaza Strip from Beit Hanoun in the north to Rafah in the south. Such fighting resulted in more risk and adversity for the Palestinian community in the Gaza Strip and increased the level of mental health problems among children and parents.¹

Studies demonstrate that people who are resilient display a greater capacity to quickly regain equilibrium physiologically, psychologically and in social relations following stressful events. Second, and equally

important, is sustainability, or the capacity to continue forward in the face of adversity.² Resilience is considered a multidimensional, dynamic construct made up of a variety of personal qualities (e.g. spirituality, personal competence, social competence, family cohesion, social resources, and personal structure). Individuals who possess these personal qualities are more likely to positively adapt when exposed to a traumatic event.^{3, 4, 5, 6, 7}

Resilience refers to a class of phenomena characterized by good outcomes in spite of serious threats to adaptation of development. It usually arises from normative functions of the human adaptation system with the greatest threats to human development being those that compromise these protective systems. Resilience involves an ordinary rather than extraordinary outlook in terms of human development and adaptation as well as direction for policy and practice aimed at enhancing the development of children at risk for problems and psychopathology.⁸ However, specific operational definitions for resilience vary widely in the literature as do the factors that define the construct. For example, Connor and Davidson⁵ identified resilience as personal qualities that enable individuals to flourish in the face of adversity. Newman⁷ defined resilience as positive adaptation in the face of a traumatic event. Richardson⁹ described resilience as an internal motivational force that drives each individual to seek wisdom, self-actualization, altruism, and inner spiritual peace. In our view, resilience is best defined as an outcome of successful adaptation to adversity. Characteristics of the person and situation may identify resilient processes, but only if they lead to healthier outcomes following stressful circumstances.

Very little is known about individual mental health and of resilience¹⁰ although Nruham et al.¹¹ conducted a longitudinal study on a subset of a representative sample of 2,464 students and revealed that resilience is a moderator of lifetime violence. Roy et al.¹² suggested a possible role for resilience as a protective factor mitigating the risk of making a suicide attempt for an individual who has experienced childhood trauma events and attempted suicide. This is supported in a study¹³ involving a survey of 475 active duty Marines attending a random sample of mandatory Transition Assistance Program workshops before leaving the military and responding to follow-up mail or web surveys for an average of six months after returning to civilian life. The finding that resilience was only associated with mental health when functional impairment was included suggests that the effect of resilience may be in its ability to maintain an individual's functionality despite mental

health problems and may not directly impact the risk of mental health symptoms per se.

The purpose of the present study is to examine the relationship between psychological problems and resilience in families' of victims of community violence due to factional fighting in the Gaza Strip between Fatah and Hamas parties.

Material and Methods

Subjects

The sample consisted of 161 Palestinian families affected by factional fighting between two political factions in the Gaza Strip (Fatah and Hamas) on July 2007; 50 of those families were randomly selected for the present study. Three of the five areas of the Gaza Strip were selected randomly. The sample consisted of 255 subjects: 120 were males (47.1%) and 135 were females (52.9%). The age ranged from 18-67 years ($M = 31.77 + 14.84$).

Study procedure

In the present study, the data collection team consisted of six trained female field workers who attended a training session with the two researchers to inform them about the questionnaire and sampling process. The researchers used the available data about the distribution of the population and randomly selected the sample. Formal letters were obtained from an ethical committee at the start of the study. Participants were interviewed inside their homes. They were informed about the study objectives and told that their names would not be included and the data would be kept in a safe place with the researchers.

Instruments

Sociodemographic data

The participants' demographic data were collected by questionnaire and included gender, age, income, marital status, and place of residence.

Symptoms Checklist-R¹⁴

Mental distress was evaluated by the self-report, 90-item Symptom Checklist (SCL-90-R), which is a general standardized measure of psychopathology. It has been tested and employed in various cultural and clinical settings including those concerning trauma victims in the Palestinian society.¹⁵ The symptom level of each item of the SCL-90-R is rated by the subject on a five-point scale of distress, from 'not at all' (score 0) to 'extremely' (score 4). The average of the scores of these 90 items, called the global severity index (GSI), indicates an overall degree of mental distress. The items of the SCL-90-R are known to factor into nine primary symptom

dimensions, denoted by somatization (1, 4, 11, 29, 40, 42, 48, 49, 52, 58, 71), obsessive-compulsive (3, 9, 10, 28, 38, 45, 46, 51, 55, 65), interpersonal sensitivity (6, 21, 34, 36, 37, 41, 61, 69, 73) depression (2, 5, 14, 15, 20, 22, 26, 27, 28, 30, 31, 32, 54), anxiety (12, 17, 23, 33, 39, 57, 72, 79, 80, 86), hostility (13, 24, 63, 67, 74, 81), phobic anxiety (25, 47, 50, 70, 75, 78, 82), paranoid ideation (8, 18, 43, 68, 76, 83), and psychoticism (7, 16, 35, 62, 77, 84, 85, 87, 88) are usually not reported (19, 44, 53, 59, 60, 64, 66, 89). For each of these nine dimensions, the average score of the items comprising this dimension constitutes the score of that dimension. Since a relatively large number of subjects will usually have a score 0 (not at all) for a given item, and the score digits range from 0 to 4, the mean scores for a large group often obtain values less than 1. This instrument was validated in Arab countries and in Palestine and showed high reliability (Cronbach's $\alpha = .92$).¹⁶ In the present study, the internal consistency of the complete SCL-90-R was high (Cronbach's $\alpha = .96$) and split half was 0.86.

The Resilience Attitude Scale¹⁷

The scale contains 47 items covering the resilience characteristics of commitment, feelings of control and willingness to take challenges. Children were instructed to evaluate on a three-point scale how well the feelings and thoughts describe their own feelings: 'not at all' (0), 'to some extent' (1), and 'very well' (2). The total score ranges from 0–141 with higher scores reflecting greater resilience. Three subscales were constructed: Commitment (16 items, e.g., 'I care a lot about problems and things that happen around me'; 'I care for all possible initiatives that may help my family and community'), Control (14 items, e.g., 'I think luck and accidents play a major role in my life'; 'I think people's lives are influenced by external forces that they cannot control') and Challenge (17 items, e.g., 'I am curious to

know the unknown'; 'When I have solved one problem, I enjoy moving on to solving another one'). The Resilience Attitudes Scale has been validated in the Arabic culture in Egypt¹⁷ and has been found reliable among Palestinians in the Gaza Strip (Cronbach's $\alpha = 0.84$ and split half = .84)¹. In this study the internal consistency was (Cronbach's $\alpha = .86$).

Statistical analysis

Data analysis was carried out using a statistical software SPSS version 16.0. Descriptive statistics were used to report socio-demographic variables. Internal consistency was assessed by Cronbach's α coefficient. For continuous variables, mean and standard deviation were used for data reporting and statistical tests used for comparison were t-test when comparing two groups. One way ANOVA tests were used to test differences between psychological problems and resilience and more than two groups of continuous variables such as place of residence and family income. Rank correlation (Spearman's rho) was used to assess the correlation between the psychological symptoms scores and resilience scores.

Results

Sociodemographic characteristic of the study

The sample responding to the interview were 255 participants with a response rate of 96%; it consisted of 120 males (47.1%) and 135 females (52.9%). The age ranged from 18-67 years with mean age being $M = 31.77 \pm 14.84$. According to place of residence, 34.1% were from North Gaza, 30.2% were from Gaza, and 35.7% were from Khan Younis. Regarding marital status, 50.2% were single, 41.6% were married, and 8.2% were widowed. Regarding the family monthly income, 3.5% had high monthly income (above \$751), 79.24 % of the families had moderate (\$251-750) monthly income, and 17.3% of families had low (less than \$250) monthly income.

Table 1. Sociodemographic characteristics of the study sample (N = 255)

Variable	N	%
Gender		
Males	120	47.1
Females	135	52.9
Age 18-67 years, Mean = 31.77 years, (SD= 14.84)		
Place of residence		
North Gaza	87	34.1
Gaza	77	30.2
Khan Younis	91	35.7
Marital status		

Single	128	50.2
Married	106	41.6
Widowed	21	8.2
Place of residence		
North Gaza	87	34.1
Gaza	77	30.2
Khan Younis	91	35.7
Family monthly income		
High income (\$751 and more)	9	3.5
Moderate income (\$351-750)	202	79.2
Low income (less than \$350)	44	17.3

Means and standard deviations of psychological symptoms (SCL-90 and subscales)

The results showed that the subjects of the sample with psychological symptoms ranged from 17 to 219 symptoms (mean =121.48, SD = 40.78), somatization ranged from 0-39 (mean = 17.40, SD = 9.93), obsessive compulsive symptoms ranged from 2-30 (mean = 16.17, SD = 6.72), interpersonal sensitivity ranged from 0-24

(mean = 11.90, SD = 4.70), depression ranged from 0-42 (mean = 22.06, SD = 9.77), anxiety ranged from 2-31 (mean = 13.41, SD = 6.70), hostility ranged from 1-20 (mean = 8.67, SD = 4.75), phobic anxiety ranged from 0-26 (mean = 8.37 , SD = 4.91), paranoid ranged from 0-18 (mean = 8.74 , SD = 4.412), and psychosis ranged from 0-26 (mean = 12.03, SD = 7.29).

Table 2. Mean and standard deviations of the SCL-90 items

	Minimum	Maximum	Mean	SD
Total SCL-90	17	219	121.48	40.78
Somatization	0	39	17.40	9.93
Obsessive-compulsive	2	30	16.17	6.72
Sensitivity	0	24	11.90	4.70
Depression	3	42	22.06	9.77
Anxiety	2	31	13.41	6.70
Hostility	1	20	8.67	4.75
Phobic anxiety	0	26	8.37	4.91
Paranoid	0	18	8.74	4.21
Psychosis	0	26	12.03	7.29

Differences in psychological symptoms and sociodemographic variables

In order to find differences in gender and psychological symptoms, t independent test was conducted in which total mental health problems and subscales were entered separately as the dependent variable and gender as the independent variable. The results showed that females reported more somatization than males (t = -4.51, p = 0.001), more obsessive compulsive symptoms (t= -6.13, p = 0.001), more anxiety symptoms (t= -5.14, p = 0.001), and more phobic anxiety symptoms (t= -8.22, p = 0.001). No gender differences in other psychological problems.

Psychological problems and sociodemographic variables

ANOVA tests were done in which each of the mental health subscales were the independent variables and marital status, place of residence, income as dependent variables. Post hoc test using Tukeys test showed that hostility was more in low-income families when

compared to moderate or high income (F= 5.37, p = 005), paranoia was more in people from families of moderate monthly income rather than low or high monthly income (F = 6.32, p = 0.002), psychosis was more in people coming from families of low monthly income rather than of moderate or high monthly income families (F = 7.07, p = 0.001). Regarding place of residence, phobia was more apparent in people living in north Gaza than in Gaza or Khan Younis (F= 50.33, p = .001) (F=4.97, p = 0.008).

For marital status, somatization symptoms were more in married than single or widowed (F= 50.33, p = .001), obsessive symptoms were more in single than in married or widowed (F = 15.55, p = 0.001), sensitivity was higher in widowed than single or married (F = 4.63, p = 0.01), anxiety was higher in widowed than single or married (F= 3.24, p = 0.04), phobia was higher in single than married or widowed (F= 3.80, p = 0.02).

Resilience in Palestinian families

Participants reported from 24 to 98 resilience items with mean = 60.84 (SD = 12.25), commitment subscale items ranged from 8 to 49 with mean = 24.17 (SD = 4.99),

control subscale items ranged from 7 to 39 with mean = 17.41 (SD = 4.97), and challenging subscale items ranged from 5 to 30 with mean = 19.26 (SD = 4.49).

Table 3. Mean and standard deviations for resilience

	Minimum	Maximum	Mean	SD
Total resilience	24	98	60.84	12.25
Commitment	8	49	24.17	4.99
Control	7	39	17.41	4.97
Challenge	5	30	19.26	4.49

Gender differences in resilience

In order to investigate gender differences when using resilience, t independent test was performed in which gender and age were the dependent variable and resilience, commitment, control, and challenging as

independent variables. The results showed that there were significant differences between males and females in total resilience toward males ($t = 3.38$, $p = 0.001$), commitment ($t = 2.68$, $p = 0.01$), control ($t = 3.44$, $p = 0.001$), and challenging ($t = 3.75$, $p = 0.001$).

Table 4. Gender differences in resilience and subscale

	Gender	Mean	SD	MD	T	p
Commitment	M	25.27	5.44	3.381	3.38	0.001
	F	23.19	4.34			
Control	M	18.28	5.43	2.684	2.68	0.01
	F	16.63	4.40			
Challenge	M	20.27	4.95	3.438	3.44	0.001
	F	18.37	3.84			
Resilience	M	63.82	13.54	3.752	3.75	0.001
	F	58.19	10.32			

Resilience and sociodemographic variables

ANOVA tests were done in which total resilience and each of the subscales was the independent variables and marital status, place of residence, income as dependent variables. Post hoc test using Tukeys test showed that people living in north Gaza reported less resilience and less challenge than people living in Gaza or Khan Younis ($F = 5.98$, $p = 0.003$; $F = 4.18$, $p = 0.01$).

Regarding other socioeconomic items, the results showed no significant differences according to marital status or economic status of the families (low, moderate, high income). In terms of the relationship between psychological problems and resilience, in order to find the relationship between psychological problems and resilience subscales such as commitment, control, and challenge, a correlation coefficient Spearman test was done. The results showed that total psychological problems was correlated negatively with total scores of resilience ($r = -0.28$, $p = 0.02$), obsessive compulsive ($r =$

-0.16 , $p = 0.05$), sensitivity ($r = -0.31$, $p = 0.001$), depression ($r = -0.24$, $p = 0.04$), anxiety ($r = -0.28$, $p = 0.001$), phobic anxiety ($r = -0.36$, $p = 0.001$), paranoid ($r = -0.19$, $p = 0.02$), and psychosis ($r = -0.25$, $p = 0.03$) were also correlated negatively with total scores of resilience.

Total psychological problems ($r = -0.27$, $p = 0.02$), sensitivity ($r = -0.26$, $p = 0.001$), and phobic anxiety ($r = -0.22$, $p = 0.01$) were correlated negatively with commitment. Also, sensitivity ($r = -0.18$, $p = 0.03$), anxiety ($r = -0.21$, $p = 0.02$), phobic anxiety ($r = -0.29$, $p = 0.001$) were negatively with and challenge. Total psychological problems ($r = -0.44$, $p = 0.001$), obsessive compulsive ($r = -0.23$, $p = 0.01$), sensitivity ($r = -0.38$, $p = 0.001$), depression ($r = -0.36$, $p = 0.001$), anxiety ($r = -0.34$, $p = 0.001$), paranoid ($r = -0.35$, $p = 0.001$), and psychosis ($r = -0.41$, $p = 0.001$) were correlated negatively with control.

Table 5. Correlation coefficient of resilience and psychological problems

		1	2	3	4	5	6	7	8	9	10
Commitment	R	-.27[*]	-.04-	-.14-	-.26^{**}	-.21-	-.20[*]	-.01-	-.29^{**}	-.14-	-.27-
	p	0.02	0.57	0.09	0.00	0.08	0.02	0.85	0.00	0.09	0.02
Control	r	-.042-	-.079-	-.049-	-.16--06-		-.18[*]	0.14	-.22^{**}	-.013-	0.01
	p	0.73	0.34	0.56	0.05	0.60	0.03	0.08	0.01	0.88	0.91
Challenge	r	-.44^{**}	-.12-	-.23^{**}	-.38^{**}	-.36^{**}	-.34^{**}	-.14-	-.40^{**}	-.35^{**}	-.41-
	p	0.00	0.14	0.01	0.00	0.00	0.00	0.09	0.00	0.00	0.00
Resilience	r	-.28[*]	-.09-	-.16[*]	-.31^{**}	-.24[*]	-.28^{**}	-.001-	-.36^{**}	-.19[*]	-.25-
	p	0.02	0.25	0.05	0.00	0.04	0.00	0.99	0.00	0.02	0.03

1-Total SCL-90, 2- Somatization, 3- Obsessive-compulsive, 4- Sensitivity, 5-Depression, 6- Anxiety, 7- Hostility, 8- Phobic anxiety, 9- Paranoid, 10- Psychosis

Discussion

Our results showed that females reported more somatization, obsessive compulsive symptoms, anxiety symptoms and more phobic anxiety symptoms than males. This could be due to the cultural factors in which females in non-western society express their emotional problems physically through somatic symptoms. Hostility was higher in low-income families when compared with moderate or high income, paranoia was more in people from families of moderate income than low or high income, psychosis was more in people coming from families of low income than of moderate or high income families. The above mentioned findings showed that mental health problems were more common in poor families, which indicated that poverty is one of the risk factors for developing mental health problems in Palestinian society with more than 38.5% of families under living below poverty (PCBS, 2010).¹⁸ Phobia was more in people living in north Gaza than in Gaza city or Khan Younis. This could arise from the fact that this area is a border area with many repeated incursions and bombardment in the last decade. Similar study in the area showed that adults reported higher levels of anxiety and fears.¹ Our study found higher rates of psychological problems when compared with other studies, such as a study of African-American and Caucasian-American students, which showed that the mean SCL-90 was 79.41 for African-Americans and 96.61 for Caucasian-Americans.¹⁹ This difference could be a result of the current situation in the Gaza Strip with continuity of the siege and closure of the area and repeated shelling and bombardment. Such chronic stressors and traumatic events are the cause of higher rates of mental health problems; including anxiety, depression, and posttraumatic stress disorder (PTSD).

Our study findings showed that male Palestinians were more resilient, committed, controlling, and challenging in the face of traumatic events due to factional fighting

between Hamas and Fatah. Gender differences in resilience levels have been investigated less often, but one consistent finding is that resilient women tend to elicit and provide more social support for overcoming their adversities and problems. Other studies found that women reported significantly higher levels of using 'social support' than men whereas men reported sub-significantly higher levels of 'personal competence' than women.²⁰ One explanation for our finding is that females are more willing to report or acknowledge their negative events and emotions, which might threaten and lower their psychological resilience. Another reason is that women are thought to be more sensitive to problems under high stress conditions. When encountering difficulties or stresses, females tend to evade or use maladaptive coping strategies whereas males choose positive coping strategies that focus on the immediate problem.²¹ However, others found no gender comparison reached statistical significance in terms of resilience in previous research (Campbell-Sills et al., 2006).⁴

The results showed that people who scored higher on psychological problems, including obsessive compulsive, sensitivity, depression, anxiety, phobic anxiety, paranoia, and psychosis had been less resilient. People with more total psychological problems, sensitivity and phobic anxiety had less commitment. People with sensitivity, anxiety and phobic anxiety had less control. Also, people with more psychological problems, obsessive compulsive, sensitivity, depression, anxiety, paranoia, and psychosis were less challenging. Our findings were consistent with Friborg et al.²² in which sample patients in Norway reported that resilience was negatively related to mental health problems. Also, King et al.²³ found that several factors, including higher levels of both perceived ('functional') and structural (e.g. membership in organizations) social support were associated with a lower likelihood of PTSD. Others postulated that resilient people are typically characterized by optimism,

positive coping, and hardiness, and these characteristics are associated with better physical and mental health outcomes and more positive adaptive behaviors to negative life events (Connor and Davidson).⁵ Compared with young adults with low levels of resilience, those with high levels of resilience are less likely to have mental health problems, interpersonal conflicts, behavioral disorders, and poor academic performance.²⁴ It is important to understand the relationships between mental health problems and other variables (e.g., personality traits and social support), and to test the possible moderating effect of resilience between negative life events and mental health problems. Resilience enables people to thrive in the face of adversity. Improving resilience must be an important goal for treatment and prophylaxis.²⁵ Negative life events may lead to mental health problems, such as depression or anxiety, but an individual with a high level of resilience may cope with the difficulties more effectively and remain healthy.

Conclusion and clinical implication

The present study findings demonstrated that Palestinians in the Gaza Strip reported more psychological problems due to long-standing stress and trauma due to community violence. Resilience as an outcome of experiences of stress and trauma and coping strategies, social support was affected by the presence of psychological problems among Palestinians in which people with more psychological problems showed less resilience. The present study highlights the need for community reconciliation between the factions and increased effort in social reconciliation; more programs for psycho-education of subjects, which may help to increase coping and resilience. Also, families affected directly by such community violence should be targeted with their children by programs, including psychological intervention, social and community support groups, stress management, and parenting training. Our study had several limitations, such as we did not examine other Palestinian families affected by other political violence; children were not included in this study; and other factors such as political affiliation, social, and family support were not included.

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References

1. Thabet AA, Abu Tawahina A, El Sarraj E, Vostanis P. Exposure to war trauma and PTSD among parents and children in the Gaza Strip. *European Child & Adolescent Psychiatry* 2008;17: 191-199.
2. Bonanno GA. Loss, trauma and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *The American Psychologist* 2004;59(1): 20-28.
3. Campbell-Sills L, Cohan SL, Stein MB. Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behaviour Research and Therapy* 2006;44(4): 585-599.
4. 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. *Journal of Traumatic Stress* 2007;20: 1019-1028.
5. Connor KM, Davidson JR. Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety* 2003;18(2): 76-82.
6. Luthar S, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. *Child Development* 2000;71: 543-562.
7. Newman R. APA's resilience initiative. *Professional Psychology: Research and Practice* 2005;36(2): 227-229.
8. Masten AS. Ordinary magic: Resilience processes in development. *American Psychologist* 2001; 56: 227-238.
9. Richardson GE. The meta-theory of resilience and resiliency. *Journal of Clinical Psychology* 2002;58(3): 307-321.
10. Caspi A, Sugden K, Moffitt TE, Taylor A, Craig IW, Harrington H, McClay J, Mill J, Martin J, Braithwaite A, Poulton Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science* 2003; 301: 386-389.
11. Nruham L, Holen A, Sund AM. Associations between attempted suicide, violent life events, depressive symptoms, and resilience in adolescents and young adults. *The Journal of Nervous and Mental Disease* 2010;198(2): 131-141.
12. Roy A, Carli V, Sarchiapone M. Resilience mitigates the suicide risk associated with childhood trauma. *Journal of Affective Disorders* 2011;133(3): 591-594.
13. Hourani L, Bender RH, Weimer B, Peeler R, Bradshaw A, Lane M, Larso G. Longitudinal study of resilience and mental health in marines leaving military service. *Journal of Affective Disorders* 2012;139: 154-165.
14. Derogatis LR. SCL-90R: Administration, Scoring, and Procedures. Manual II. 1984 (Towson, MD: Clinical Psychometric Research)
15. Afana, AH, Dalgard, OS, Bjertness E, Grunfeld B. The ability of general practitioners to detect mental health disorders in primary health care patients in a stressful environment: Gaza Strip. *Journal of Public Health Medicine* 2002;24: 326- 331.

16. Maghri R, Thabet AA. Mental Health of Parents of Children with hearing disabilities in the Gaza Strip. Arabpsynet E. Journal 2008;18: 177-189.
17. Maekhemer E. The Resilience Attitude Scale 2002. Cairo: Anglo Egyptian Library.
18. Palestinian Central Bureau of Statistics. Poverty in the Palestinian Territory Press release. 2009-2010. www.pcbs.gov.ps/Portals/_pcbs/PressRelease/poor_E2010.pdf.
19. Ayalon L, Young MA. Using the SCL-90-R to assess distress in African Americans and Caucasian Americans. Journal of Black Studies 2009;39(3): 420-433.
20. Werner EA. Families, children with autism and every day occupations. (Doctoral dissertation, Nova Southeastern University). Dissertation Abstracts International,(2001). 6204B, 1835. (UMINo.AAI3012896).
21. Hampel P, Petermann F. Age and gender effects on coping in children and adolescents. Journal of Youth and Adolescence 2005;34(2): 73-83.
22. Friborg O, Hjemdal O, Rosenvinge JH, Martinussen M. A new rating scale for adult resilience: What are the central protective resources behind healthy adjustment? International Journal of Methods in Psychiatric Research 2003;12: 65-76.
23. King LA, King DW, Fairbank JA, Keane TM, Adams GA. Resilience-recovery factors in post-traumatic stress disorder among female and male Vietnam veterans: Hardiness, post war social support, and additional stressful life events. Journal of Personality and Social Psychology 1998;74(2): 420-434.
24. Rew L, Taylor-Seehafer M, Thomas NY, Yockey RD. Correlates of resilience in homeless adolescents. Journal of Nurse Scholarship 2001;33(1): 33-40.
25. Dmitry MD, Robert S, Karen R, Isabelle C. Resilience and mental health. Clinical Psychology Review 2010;30(5): 479-495.

المخلص

الهدف من هذه الدراسة هو فحص العلاقة بين المشاكل النفسية في ضحايا الأسر الفلسطينية التي عانت من العنف المجتمعي والصمود النفسي في قطاع غزة. تألفت عينة الدراسة من البالغين ممن تتراوح أعمارهم ما بين 18 – 67 عاماً مع متوسط العمر كان 31.71 عاماً وقد تم جمع البيانات من المشاركين بواسطة استبيان يشمل المعلومات وقائمة الأعراض النفسية – 90 بند المراجع، ومقياس الصمود النفسي للبالغين. أظهرت الدراسة بأن متوسط الأعراض النفسية كان 121.48 ، ومتوسط أعراض الجسدية كان 17.40 ، وأعراض الوسواس القهري كان 16.17، 11.90، ومتوسط أعراض الحساسية الشخصية كان 11.90، وكان متوسط الإكتئاب 22.06، والقلق كان 13.41، وأعراض العدائية كانت 8.67، ومتوسط رهاب القلق كان 8.37، ومتوسط جنون العظمة كان 8.74، ومتوسط أعراض الذهان كانت 12.03. أظهرت النتائج بأن الأنات أظهرن أعراض الجسدية والوسواس القهري، والقلق أكثر من الذكور. وكان العداء أكثر في الأسر ذات الدخل المنخفض عنه عن الأسر ذات الدخل المتوسط والعالي، بينما كانت أعراض جنون العظمة أكثر في الناس من العائلات ذات الدخل المتوسط أكثر من الأسر ذات الدخل المنخفض والعالي. بينما الذهان كان أكثر في الأشخاص المنحدرين من أسر ذات دخل منخفض عنه ذات الدخل المتوسط أو العالي. أما بالنسبة للصمود النفسي وكل من محاوره وهي الإلتزام، والتحكم، والمنافسة فقد كان أكثر في الذكور عنه في الإناث. وأظهرت النتائج أن الناس الذين يعيشون في شمال قطاع غزة هم أقل في الصمود النفسي عنهم عن الذين يعيشون في مدينة غزة أو خان يونس. وقد أظهرت النتائج أن مستوى الصمود النفسي يرتبط عكسياً مع وجود المشاكل النفسية، وكذلك مع الوسواس القهري، والاكتئاب والقلق، ورهاب القلق، وجنون العظمة والذهان، وبالأخص كان هناك ارتباط عكسي بين الإلتزام كجزء من الصمود النفسي مع المشاكل النفسية عموماً، ومع الحساسية التفاعلية، ورهاب القلق، بينما كان هناك أيضاً ارتباطاً سلبياً ما بين التحكم والحساسية التفاعلية، والقلق ، ورهاب القلق. وكان هناك ارتباط عكسي ما بين التحدي كجزء من الصمود النفسي وكل من أعراض الوسواس القهري، والحساسية التفاعلية، والاكتئاب، والقلق وجنون العظمة، والذهان. أظهرت نتائج الدراسة بأن الفلسطينيين في قطاع غزة يعانون أكثر من المشاكل النفسية عنهم من أشخاص آخرين في مناطق أخرى لأنهم تعرضوا لفترة طويلة لضغوط نفسية وصدمات نفسية مستمرة حتى يومنا هذا. بالإضافة إلى العنف المجتمعي في الآونة الأخيرة بين الفصائل الفلسطينية الرئيسية في قطاع غزة والذي أدى إلى الإقتتال الداخلي. ذلك أدى إلى ظهور مزيد من المشاكل النفسية التي أدت إلى انخفاض مستوى الصمود النفسي. ولذلك يجب العمل على مساعدة الأشخاص الذين يعانون من مشاكل نفسية في البحث عن طرق تؤدي إلى بناء صمود نفسي أكثر لمواجهة الظروف الحياتية الصعبة من عنف سياسي ومجتمعي. وكذلك تعزيز قدرات سكان قطاع غزة على التكيف بشكل أفضل في حياتهم اليومية من خلال برامج تدخل متخصصة.

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Violent Behavior among Adolescents: Findings from the National Survey of Palestinian School Children

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السلوك العنيف لدى المراهقين: النتائج المستقاة من المسح الوطني للسلوك الصحي بين طلبة المدارس الفلسطينية عام 2004
خلود الخياط الدجاني، زياد عابدين، رضوان قسراوي

Abstract

Aim: The purpose of the present study was to provide data about the prevalence of violent behavior among adolescent school students living in Palestine and to determine the correlates of physical fighting. **Method:** This study involved the completion of a modified version of Health Behavior in School Age Children (HBSC) 2003/2004 survey questionnaire by 17,715 grade 6–12 students. Chi square tests and forwards stepwise multiple logistic regression models were used for statistical analyses. **Results:** In the 12 months preceding the survey, 46.1% of students (n=8036) reported that they had been in a physical fight; 41.7% (n=7265) reported that they were involved in a fight which required medical treatment. During the last school term, 33% (n=5742) bullied others at school; 48.7% (n=8503) reported having been bullied at school; 23.3% (n=4054) reported that they carried a weapon on school grounds. In logistic regression analyses being male, current cigarette use, bullying, being bullied with a weapon, carrying a weapon, spending more time with friends and poor school image were found to be associated with fighting. **Conclusion:** Violent behavior is common in adolescent school students. There is a strong need for violence prevention programs in schools.

Keywords: Adolescents, fighting, risk factors, violence

Declaration of interest: None

Introduction

Violence is a daily reality for people living all over the world. Adolescents are especially vulnerable to its consequences because adolescence is the life period when many behaviors and attitudes change. It is also the time when personality develops and is shaped. Being a victim of violence and/or witnessing violence may lead many adolescents to use violence to resolve interpersonal conflict instead of using non-violent conflict resolution skills. In previous studies, data indicate that higher levels of exposure to violence and victimization in the home and community were associated with the use of violence and weapon carrying among adolescents.^{1,2} The intention to use violence was also found to be associated with physical abuse, degree of family conflict, poor grades, weak school bonds, depression, psychosomatic disorders and low self-esteem.^{3,9} Physical fighting, a common form of violent behavior among adolescents, is a prominent cause of injuries and homicides in this age group. In the USA, homicide is the second leading cause of death among teenagers.^{10, 11}

In Palestine, information on the rate of violent behavior and injuries among adolescents is not available. However, there is increased concern about violent behaviors among adolescents in the school setting and in the community. To improve knowledge about youth violence in Palestine and to prevent violent behavior

among young persons, a better understanding of its dynamics is required.

The purpose of the present study is to provide data about the prevalence of violent behavior among adolescent school students living in Palestine and to determine the behavioral and social context of physical fighting.

Methodology

The HBSC study is an international, cross-sectional study aimed at increasing understanding of youth health behaviors and lifestyles. The 2003/2004 Palestinian HBSC survey was approved by the University ethical committee and Research Ethics Board of the Palestinian Ministry of Education. The distribution of the students reflected the distribution of Palestinians in grades 6, 8, 10 and 12 and the sample was designed to be self-weighted. Within each district, samples were selected to represent distributions of schools by size, location, and gender and school type: public and private schools and UNRWA schools run by the United Nations Relief and Works Agency for Palestine Refugees in the Near East. Thus, the sample of this survey was a nationally representative sample.

Sample selection

Sampling procedure was designed according to the international HBSC protocol and in accordance with the sampling requirements of the WHO-HBSC.¹² The sample was drawn based on 2003-2004 list of schools, classrooms (that included the number of students per classroom) provided by the Palestinian Ministry of Education. Secondary schools (n= 405) were selected randomly within the 16 governorates throughout the West Bank and Gaza Strip. All students in grades 6, 8, 10 and 12 in selected classes were eligible to participate at the time the questionnaire was distributed. There were no exclusion criteria.

The sample size for each of the four grades was 4000 students. This represents 14,861 (83.9% of the total students) students from 343 public secondary schools; 636 (3.6% of the total students) students from 22 private secondary schools and 2218 (12.5% of total students) students from 40 UNRWA secondary schools in Palestine.

Procedures

As part of the HBSC survey, a representative sample of 18,000 students from the 6th, 8th, 10th, and 12th grades in 430 formal schools was conducted from April to June 2005. The Palestinian Ministry of Education and Higher Education provided detailed computerized lists of the respective sampling frames, which enabled the Palestinian Central Bureau of Statistics to draw the required samples. Selected schools were informed about the survey by a letter to the school principal. All school principals agreed to participate in the study. Completion of the survey took one 40–60 minute class period. Data were collected during the second semester between April and May 2004.

A self-report questionnaire was administered in the classroom in the presence of a school psychologist and in the absence of the classroom teacher in order not to influence student answer. Researchers followed a standardized protocol when giving instructions to students and answering questions about individual items. Student participation was voluntary; however, no student refused to cooperate in the research. Verbal and written instructions reminded students of the importance of giving honest answers; not writing their names on the questionnaire to maintain confidentiality and not talking during questionnaire completion.

Instruments

The international version of Health Behavior in School Age Children (HBSC) 1997/1998 survey was the main instrument used in the present study¹³. In September 1997, a pilot study was conducted before the

administration of the National HBSC survey. The purpose of the pilot was to modify the international questionnaire for use with Palestinian school children. The Palestinian questionnaire is consistent with the international protocol in that it includes the core questionnaire, the focus questionnaire, and the optional questionnaire. Several additional questions have been included in the Palestinian questionnaire investigating the health endangering behaviors that have not been included in the international version of the HBSC. These questions were from the United States questionnaire investigating dangerous behaviors. They included questions about smoking, driving, wearing helmets, daring behaviors, violence indexes, physical activity, and dieting. The HBSC 1997/1998 questionnaire was developed in two forms: A and B. This questionnaire consisted of two sections: core and foci. The core questions in the survey gathered information on selected demographic characteristics, health related behavior, general perceptions of personal health, psychosocial adjustment, peer relationship and support, and perception of the school and its influence. The focus questions of the survey included school experiences, relationship with parents, socio-economic status and body image. We also selected several items from the optional package of the HBSC 1997/1998 survey. These included items on violence to complete a core picture of youth violence in Palestine; the dependent variable, fighting, was defined according to participant responses to: 'In the last 12 months, how many times were you involved in physical fighting?' (Answer ranges from 'none' to '4 or more'). Items on injury were designed provide information regarding the epidemiology of medically treated non-fatal injuries among school children in Palestine. We also assessed exposure to political violence (25 items).

The final questionnaire used in the present study consisted of 245 questions. The study was piloted on 300 students selected from a secondary school that was not included in the main sample. Minor wording changes were made to clarify the meaning of certain questions. One question related to religion was omitted by the Ministry of Education.

Measurement

The independent variables included gender, peer factors (time spent with friends both directly after school and at night, the number of close friends and ease of making new friends), school factors (perception of teachers' opinion about the student's performance, truancy, feelings about school, being left alone at school, feeling safe at school, perceived school image (scale), support from teacher (scale), support from fellow students (scale)

and support from parents on school matters (scale), personal factors (self-appraisal of general and mental health (scale), feeling left out of things, feeling helpless, happiness, self-confidence and self-image), risky behaviors (smoking, seat belt use, being bullied and bullying, and carrying a weapon).

The dependent variable, fighting, was defined according to participant responses to: 'In the last 12 months, how many times were you involved in physical fighting?' (Answer range from 'none' to '4 or more').

Four scales examined participant relationships with school: school image scale included (students take part in making rules, students are treated too severely, rules in school are fair, school is a nice place to be, feeling of belonging to school; score 5–25, Cronbach α .558). Support from teachers scale included (teachers encourage students to express students views in the class, teachers treat students fairly, teachers offer extra help to the students, and teachers are interested in students as people; score 4–20, Cronbach α 0.675). Student support scale included (students enjoy being together, students are kind and helpful, and students accept each other as they are; score 3–15, Cronbach α 0.599). Parental support scale included (parents are willing to come to

school to talk to teachers, and parents encourage them to do well at school; score 3–15, Cronbach α 0.617). A mental health scale was developed according to participant responses to questionnaire statements on depression, insomnia, nervousness and anger. It had a possible score of 4–20 (Cronbach α 0.682). School image scale, support from teacher scale and parental support scale were used by Gofin *et al.* previously.¹⁴

Data analysis

For the univariate analysis a chi square test was used to compare categorical variables. A forward stepwise multiple logistic regression model was used to determine the independent variables related to fighting.

Results

The total sample was 17,715 adolescents. Almost 48% of the sample (n=8466; 47.8%) were female. The age range in the sample was 10 to 19 years with a mean age of 15.1 \pm 2.27. Approximately equal numbers of subjects were recruited from grades 6 (n=4653), 8 (n=4607), 10 (n=4388) and 12 (n=4067).

Prevalence of violent behavior and differences between genders at the same grade are summarized in Table 1.

Table 1. Violent behavior among adolescent school students: differences between genders at the same grades (Chi square test results)

		N	Been bullied past 2 months	Bullying others at school	Carrying a weapon on school	Fighting in the last 12 months	Being injured in a fight in the last 12 months
6th Grade	Male	2189	1303 (59.5) *	1001 (46.1) *	833 (37.8) *	1551 (70.8) *	1287 (58.7) *
	Female	2386	1169 (49.0)	609 (25.6)	254 (10.7)	927 (39.0)	1013 (42.6)
	Total	4575	2472 (54.0)	1610 (35.4)	1087 (23.7)	2478 (54.3)	2300 (50.3)
8th Grade	Male	2040	1160 (56.9) *	921 (45.4) *	872 (42.8) *	1302 (64.1) *	1103 (54.1) *
	Female	2483	1232 (49.6)	714 (28.8)	415 (16.7)	941 (38.0)	913 (36.8)
	Total	4523	2392 (52.9)	1635 (36.3)	1287 (28.5)	2243 (49.8)	2016 (44.6)
10th Grade	Male	2122	1038 (48.9) *	790 (37.3) *	751 (35.3) *	1185 (55.9) *	998 (46.9) *
	Female	2208	1004 (45.5)	563 (25.6)	236 (10.7)	640 (29.0)	657 (29.7)
	Total	4330	2042 (47.2)	1353 (31.3)	987 (22.8)	1825 (42.2)	1655 (38.2)
12th Grade	Male	1956	761 (38.9) *	688 (35.1) *	518 (26.6) *	939 (48.0) *	735 (37.6) *
	Female	2067	836 (40.4)	456 (22.2)	175 (8.5)	551 (26.9)	559 (27.2)
	Total	4023	1597 (39.7)	1144 (28.5)	693 (17.3)	1490 (37.2)	1294 (32.2)

*p < =05, *p < =01, **p < =001

The total number of students who responded to the fighting questions was 17,399 (98.2% of total participants; 8293 males, 47.7%, 9106 females, 52.3%).

Of the students, 46.1% (n=8036, females: n=3059, 33.6%; males: n=4977, 60.4%) reported that they had been in a physical fight during the twelve months

preceding the survey. Boys were more likely than girls to report a physical fight at each grade ($p=0.00001$ for each comparison).

Of the students, 41.7% ($n=7265$) (females: $n=3142$, 43.2%; males: $n=4123$, 56.7%) reported that they were involved in a fight which required medical treatment during the 12 months preceding the survey. Male students were more likely than female students to report a physical fight which required medical treatment at each grade ($p=0.00001$ for each comparison).

Regarding bullying, 33% ($n=5742$) (female: $n=2342$, 40.7%, male: $n=3400$, 59.3%) bullied others during the last school term. Boys were more likely than girls to

report bullying others at each grade ($p=0.0001$ for each comparison).

Regarding bullying, 23.3% ($n=4054$) (females: $n=1080$, 26.6%; males: $n=2974$, 73.4%) reported that they carried a weapon at school during the last month. When students from public secondary schools were compared to students from private schools, it was found that the rate of being bullied at school, being bullied with a weapon at school and carrying a weapon on school were significantly more common in male students of public secondary schools (Table 2).

**Table 2. Violent behavior: differences between students in public, private and UNRWA schools
(Chi square test results)**

Variables	Gov.			Private			ANRWA		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	N=14639	N=7152	N=7487	N=629	N=315	N=314	N=2183	N=840	N=1343
Been bullied past two months	7030 (48.0)	3580 (50.1) *	3450 (46.1%)	280 (44.5%)	143 (45.4%)	137 (43.6%)	1193 (54.6%)	539 (64.2%) *	654 (48.7%)
Bullying others at school	4757 (32.6)	2847 (40.0) *	1910 (25.6%)	237 (37.7%)	140 (44.6%) *	97 (30.9%)	748 (34.5%)	413 (49.2%) *	335 (25.2%)
Carrying a weapon on School	3439 (23.5)	2536 (35.4) *	903 (12.1%)	146 (23.3%)	113 (35.8%) *	33 (10.6%)	469 (21.5%)	325 (38.6%) *	144 (10.8%)
Fighting in the last 12 months	6605 (45.3)	4186 (58.7) *	2419 (32.4%)	294 (46.7%)	190 (59.9%) *	104 (33.2%)	1137 (52.3%)	601 (71.6%) *	536 (40.2%)
Being injured in a fight in the last 12 months	5986 (40.9)	3501 (48.9) *	2485 (33.3%)	241 (38.5%)	136 (43.3%)	105 (33.7%)	1038 (47.6%)	486 (57.9%) *	552 (41.2%)

* $p < .05$, * $p < .01$, ** $p < .001$

When the differences between students in West Bank and Gaza Strip secondary schools were examined, it was found that male students from West Bank secondary

schools were more likely than those of Gaza Strip secondary schools to bully others (Table 3).

Table 3. Violent behavior: differences between students in West Bank and Gaza schools (chi square test results)

Variables	WB			GZ		
	Total	Male	Female	Total	Male	Female
	N=9328	N=4624	N=4704	N=8123	N=3683	N=4440
Been bullied past two months	4633 (49.7)	2354 (50.9)	2279 (48.4)	3870 (47.6)	1908 (51.8) *	1962 (44.2)
Bullying others at school	3200 (34.4)	1925 (41.8) *	1275 (27.2)	2542 (31.4)	1474 (40.1) *	1068 (24.2)
Carrying a weapon on school	2225 (23.9)	1627 (35.2) *	598 (12.8)	1829 (22.5)	1345 (36.4) *	484 (10.9)
Fighting in the last 12 months	4596 (49.3)	2879 (62.4) *	1717 (36.5)	3440 (42.6)	2096 (57.0) *	1344 (30.5)
Being injured in a fight in the last 12 months	3929 (42.1)	2329 (50.3) *	1600 (34.1)	3336 (41.1)	1793 (48.7) *	1543 (34.9)

* $p < .05$, * $p < .01$, ** $p < .001$

In forward stepwise logistic regression analyses it was found that being male, poor perception of school image, current cigarette use, not using seat belts, bullying others, carrying a weapon, being bullied with a weapon,

spending more time with friends, poor mental health score and exposure to political violence were all associated with fighting (Table 4).

Table 4 Independent variables associated with fighting in logistic regression analyses

						95% CI	
	B	Std. Error	Beta	t	P-Value	Lower	Upper
Being male	0.157	0.013	0.156	12.496	0.000	0.132	0.181
Current cigarette use	0.050	0.018	0.033	2.730	0.006	0.014	0.085
Poor school image	-0.051	0.027	-0.014	-1.899	0.058	-0.104	0.002
Not using seat belt	0.009	0.012	0.008	0.718	0.473	-0.015	0.032
Bullying others at school	0.196	0.013	0.187	14.913	0.000	0.171	0.222
Carrying a weapon on school	0.163	0.014	0.143	11.405	0.000	0.135	0.192
Been bullied past two months	0.175	0.012	0.175	14.431	0.000	0.151	0.199
Spent more time in the evening with friends	0.062	0.012	0.062	5.100	0.000	0.038	0.086
Exposure to political violence	-0.014	0.008	-0.013	-1.684	0.092	-0.029	0.002
Poor mental health score	0.016	0.015	0.012	1.062	0.288	-0.013	0.044

Discussion

Analyses indicate that a considerable proportion of the young people in our study sample were engaged in different types of violent behavior. It is remarkable that so many students indicated that they participated in physical fighting (total 42%, females 22%, males 61%) rather than bullying others (19%, females 12%, males 25%), which is expected to be a more common form of aggressive behavior among young people, as shown previously.¹⁶ Our results indicated that fighting occurred more commonly with people well known to the adolescents rather than with strangers, especially among girls. One could speculate that fighting is a conflict resolution technique used by adolescents and their close environment in our country. In this study, 10% of male students and 3% of female students reported that they had been injured in a physical fight during the 12 months preceding the survey. The higher frequency of fighting resulting in injury requiring medical treatment among boys might be related to the fact that boys are stronger than girls⁵. In this study, male adolescents were more likely than US male adolescents to report an injury related to fighting. In the present study, 7.5% of students reported that they had been bullied with a weapon at school. Additionally, 8% of students reported that they carried a weapon at school.

The differences between the rate of violent behavior at school in male students of public secondary schools and those of private schools may be attributed to school climate and policies. To determine the reasons for these differences is beyond the scope of the present study. Further studies are needed to determine the cause of more frequent violent behavior at school among male students in public secondary schools.

Although the present sample also included students living in West bank and Gaza Strip regions, the rates of violent behavior were almost similar, suggesting that

violence is not limited to inner-city secondary school students.

In logistic regression analyses, being male was independently associated with fighting as shown in several previous studies^{3, 8, 17, 18}. This finding may indicate that male adolescents use violence more commonly to resolve interpersonal conflict. This finding may also reflect the social and cultural norms of our society which makes fighting a more acceptable and normal behavior in males. Interestingly, none of the family factors were found to be independently associated with fighting in our study group.

In the present study, adolescents who spent more time with friends in the evening were more likely to report a physical fight. Poor perception of school image, being bullied with a weapon at school, bullying others at school and carrying a weapon at school were independently associated with fighting in our study sample. These data indicate that adolescents who fight were more likely to engage in and to be victims of violent behavior in the school setting when compared with those who were not involved in a physical fight. Schools are very important social settings in the community, which promote child and adolescent physical and psychosocial well-being. School climate and policies, students' experiences in school, relationships with teachers and peers are important determinants of school influence on the well-being of children and adolescents.¹⁶ Students need to see school as having purpose and meaning in their lives and they also need to feel safe at school. If adolescents are victims of violence and/or perpetrators of violence at school, schools can become risky settings for them because they learn to be violent through modeling aggression. In previous studies associations between fighting and weapon carrying, being a victim of threat or injury with a

weapon at school, not feeling safe at school and weak school bonds have been found^{2,9,17,22,23}.

In the present sample of adolescents, as has been shown previously, other health risk behaviors such as current cigarette use, bullying others and carrying a weapon were significantly associated with fighting.^{4,5,8,9,17,22,24} These findings support Jessor's problem behavior theory which indicates that there is an intra-individual co-variation of adolescent problem behaviors that cluster to form a risk behavior syndrome.²⁵

In our study, we cannot conclude that adolescents with poor mental health state and exposure to political violence are less likely to be involved in physical fighting because of the cross-sectional nature of our study. Correlation between violent behavior and a history of psychiatric disorder, depression, stress and suicide attempt have been documented in previous studies.^{4,7,9,18,26,27}

This was the largest study performed to determine the prevalence of different type of violent behavior among secondary school students in Palestine and to determine the correlates of physical fighting. There are several limitations to this study that need to be considered when interpreting the findings. First, this is a cross-sectional survey of self-reported data and does not contain direct measures of behavior. The reliability of self-reported behaviors by adolescents may be questionable. Because participant anonymity was assured in the present study, the chance of reliable reporting of information is increased. Second, as different questions have different time frames (e.g. last term versus previous 12 months), we cannot assume cause and effect relationship between the independent and dependent variables. Thus, the logistic regression analyses should only be accepted as co-variational relationships.

Conclusion

Our study showed that fighting and other types of violent behavior are realities in the daily life of Palestinian secondary school students. Thus, violence prevention projects should be developed and implemented in Palestinian schools. Results suggest that due to exposure to violence at home and at school, secondary school students learn to use violence to resolve interpersonal conflict regardless of their socio-economic background. The present study also indicates clustering of problem behavior. Physicians and other health care providers should be aware of the fact that adolescents who have been involved in a physical fight may be more likely to be engaged in other health risk behaviors and may be more likely to have poor mental health and to be

physically abused. However, our study had some limitations such as being retrospective study. To the knowledge of the researchers no other studies have been conducted in the region using the same instrument and methodology.

Acknowledgment

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References

1. O'Keefe M. Adolescents' exposure to community and school violence: prevalence and behavioural correlates. *J Adolesc Health* 1997;20: 368-76.
2. DuRant RH, Cadenhead C, Pendergrast RA, et al. Factors associated with the use of violence among urban black adolescents. *Am J Public Health* 1994;84: 612-7.
3. Ellickson P, Saner H, McGuigan KA. Profiles of violent youth: substance use and other concurrent problems. *Am J Public Health* 1997;87: 985-91.
4. Sosin DM, Koepsell TD, Rivara FD, et al. Fighting as a marker for multiple problem behaviours in adolescents. *J Adolesc Health* 1995;16: 209-15.
5. Valois RF, McKnown RE, Garrison CZ, et al. Correlates of aggressive and violent behaviours among public adolescent school adolescents. *J Adolesc Health* 1995;16: 26-34.
6. Scheline JL, Skipper BJ, Broadhead E. Risk factors for violent behaviour in elementary school boys: have you hugged your child today? *Am J Public Health* 1994;84: 661-3.
7. DuRant RH, Treiber F, Goodman E, et al. Intentions to use violence among young adolescents. *Pediatrics* 1996;98: 1104-8.
8. Grufman M, Kelly KB. Physical fighting and associated health behaviours among Swedish adolescents. *Acta Paediatr* 1997;86: 77-81.
9. Ellickson PL, McGuigan KA. Early predictors of adolescent violence. *Am J Public Health* 2000;90: 566-72.
10. Gladstein J, Cohall AT, Townsend VB, et al. Violence. In: Friedman SB, editor. *Comprehensive adolescent health care*, 2nd ed. St Louis: Mosby, 1998:868-73.
11. Sege R, Stringham P, Short S, et al. Ten years after: examination of adolescent screening questions that predict future violence-related injury. *J Adolesc Health* 1999;24: 395-402.
12. WHO, Currie C, Samdal O, Boyce W and Smith R. *Health Behaviour in School-Aged Children: a WHO Cross-National Study (HBSC): Research Protocol for the 2001/2002 Survey*. Child and Adolescent Health Research Unit, University of Edinburgh, (2001).
13. Currie C, Hurrelmenn K, Settertobulte W, et al. *Health behaviour in school aged children: a WHO cross-National*

- study. International report. WHO 2000; Health policy for children and adolescents series No1.
14. Gofin R, Palti H, Mandel M. Fighting among Jerusalem adolescents: personal and school-related factors. *J Adolesc Health* 2000;27: 218-23.
 15. Youth Risk Behaviour Surveillance- United State, 1999. *MMWR* 2000;49, No: SS-5.
 16. King A, Wold B, Smith CT. The health of youth: a cross-national survey. WHO regional publications, European series No:69.
 17. DuRant RH, Kahn J, Beckford PH, et al. The association of weapon carrying and fighting on school property and other health risk and problem behaviours among adolescent school students. *Arch Pediatr Adolesc Med* 1997;151: 360-6.
 18. DuRant RH, Getts AG, Cadenhead C, et al. The association between weapon carrying and the use of violence among adolescents living in and around public housing. *J Adolesc Health* 1995;17: 376-80.
 19. Clubb PA, Browne DC, Humphrey AD, et al. Violent behaviours in early adolescent minority youth: results from a 'middle school youth risk behaviour survey'. *Matern Child Health J* 2001;5: 225-35.
 20. Prinstein MJ, Boegers J, Spirito A. Adolescents' and their friends' health-risk behaviour: factors that alter or add to peer influence. *J Pediatr Psychol* 2001;26: 287-98.
 21. Herrenkohl TI, Maguin E, Hill KG, et al. Developmental risk factors for youth violence. *J Adolesc Health* 2000;26:176-86.
 22. Bailey SL, Flewelling RL, Rosenbaum DP. Characteristics of students who bring weapons to school. *J Adolesc Health* 1997;20: 261-70.
 23. Evereit SA, Price JH. Students' perceptions of violence in the public schools: the Metlife Survey. *J Adolesc Health* 1995;17: 345-52.
 24. DuRant RH, Krowchuk DP, Kreiter S, et al. Weapon carrying on school property among middle school students. *Arch Pediatr Adolesc Med* 1999;153: 21-6.
 25. Jessor R. Risk behaviour in adolescence: a psychosocial framework for understanding and action. *J Adolesc Health* 1991;12: 597-605.
 26. Tarter RE, Kirisci L, Vanyukov M, et al. Predicting adolescent violence: impact of family history, substance use, psychiatric history and social adjustment. *Am J Psychiatry* 2002;159: 1541-7.
 27. Brooks TL, Harris SK, Thrall JS, et al. Association of adolescent risk behaviours with mental health symptoms in adolescent school students. *J Adolesc Health* 2002;31: 240-6.

المخلص

الهدف: هدفت هذه الدراسة إلى الحصول على بيانات حول مدى انتشار سلوك العنف لدى طلبة المدارس في فلسطين ودراسة المحددات المرتبطة بظاهرة العنف . للتعامل مع البيانات، تم استخدام الاستبانة المعدلة لمسح السلوك الصحي لدى طلبة المدارس (2003 – 2004)، وتكونت عينة الدراسة من 17,715 طالباً وطالبة من الصفوف السادس حتى الثاني عشر. ولتحليل البيانات، تم استخدام اختبار مربع كاي وتحليل الانحدار المتعدد. النتائج: بينت النتائج أنه خلال الاثني عشر شهراً التي سبقت إجراء الدراسة فإن 46.1% من الطلبة أفادوا باشتراكهم في عراك / مشاجرة جسدية، 41.7% أفادوا بأن العراك احتاج إلى علاج طبي. خلال الفصل الدراسي الأخير فإن 33% أفادوا بقيامهم بترهيب الآخرين، 48.7% تم إرهابهم من قبل آخرين، 23.3% قاموا بحمل سلاح داخل المدرسة. كما بينت نتائج تحليل الانحدار أن كل من العوامل التالية ارتبطت بالعنف: جنس الذكور، التدخين، الترهيب، حمل السلاح، المكوث مع الأصدقاء لفترة طويلة، والنظرة السلبية تجاه المدرسة. في الإجمال فقد بينت النتائج أن السلوك العنيف يعتبر ظاهرة عامة لدى طلبة المدارس، كما أظهرت النتائج مدى الحاجة لإيجاد برامج تحد من مستوى العنف في المدارس.

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Prevalence and Risk Factors for Smoking among Palestinian Adolescents: Findings from the National Study of Palestinian School Children

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مدى الانتشار وعوامل الخطر التي ترتبط تدخين المراهقين الفلسطينيين:
النتائج المستقاة من المسح الوطني للسلوكيات الصحية بين طلبة المدارس الفلسطينية
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Abstract

B **ackground:** Multiple risk behavior plays an important role in association of youth smoking with individual health risk behaviors yet the importance of this observation has not been examined in the Arab communities. **Objective:** To examine the strengths of associations between individual health risk behaviors and the occurrence of smoking in the West bank and Gaza Strip and whether risks for youth smoking increased in accordance with the number of risk behaviors identified in an additive scale. **Setting:** World Health Organization collaborative cross-national survey of health behavior in school-aged children. **Participants:** A national representative sample of 17,437 students from grades 6, 8, 10 and 12. **Main Exposure Measures:** Additive score consisting of counts of self-reported health risk behaviors: unintentional injuries, non-use of seat belts, involved in physical fight, carried weapon in last 30 days, being bullied and bullied others, excess time with friends, alienation at school and home, truancy, an unusually poor diet, suicide ideation, suicide attempt and lack of physical activity. **Main Outcome Measure:** cigarette smoking. **Results:** Strong gradients in risk for smoking were observed according to the numbers of risk behaviors reported. Overall, youth reporting the largest number (>5 health risk behaviors) experienced smoking rates that were 6.87 times higher (95% confidence interval, 5.23-9.02) than those reporting no risk behaviors (adjusted odds ratios for 0 to >5 reported behaviors: 1.00, 1.20, 1.63, 2.52, 3.54, and 6.87, respectively; $P<.001$ for trend). **Conclusions:** In Palestine, gradients in risk for youth smoking increased in association with numbers of risk behaviors reported. This finding indicates that the issue of multiple risk behavior, as assessed via an additive score, merits attention as an etiological construct. This concept may be useful in future cigarette smoking prevention programs conducted among populations of young people.

Key words: Smoking, risk behavior, Palestinian adolescents

Declaration of interest: None

Introduction

Smoking is a major cause of cancer¹ respiratory,² and circulatory diseases.^{3,4} Despite various anti-smoking initiatives, estimates point to more than one billion smokers and four million annual deaths from tobacco worldwide.⁵ Non-smokers are also at risk when they are exposed to tobacco smoke. Passive tobacco smoking represents a main health hazard to children, possibly leading to otitis media, development or exacerbation of asthma, and other respiratory diseases.⁶ Smoking is therefore a major threat to the public health of the adult population.

Smoking behavior attracts a lot of attraction due to its undesirable effects on health and its considerable frequency in the youth population. To date, studies of smoking-related health behavior risk factors have not been undertaken in Palestine. Smoking behavior is often initiated in late childhood and adolescence, and early smoking onset is predictive of heavy smoking in

adulthood.^{7, 8} consequently, behavioral explanations of the etiology of smoking are of interest and may offer hope for prevention strategies.

Researchers have attempted to explain the initiation of cigarette smoking among adolescents based on theories of social learning and stress/coping.⁹ Numerous studies of American youth have found that youth who smoke are more likely to engage in other health-risk behaviors, such as behaviors linked to unintentional injuries, physical inactivity and unhealthy dietary intake.^{10,11,12,13,14} These behaviors, which are often interrelated, begin in early adolescence. Problem Behavior Theory (PBT) proposes that problem behaviors constitute a 'syndrome' or clustering of problem behaviors that center around a common underlying factor of 'unconventionality' in both personality and social environment.¹⁵ In the Adverse Childhood Experiences (ACE) Study, Anda¹⁶ suggested a different interpretation of problem behavior - that youth and adults may use tobacco and other substances

to self-medicate underlying pain associated with adverse childhood experiences or depression, and that such substance use may lead to or occur concurrently with other health-risk behaviors such as alcohol use and attempted suicide.

Various approaches to the assessment of risk-taking behaviors in youth have been proposed, and additive risk scores are one such approach. Notable proponents of additive scores include Jessor¹⁷ who used a social-psychological framework (Problem Behavior Theory) to model proneness to problem behaviors that were consolidated into an additive scale. Others¹⁸ have criticized the use of additive scales and, instead, have created behavioral constructs that are multidimensional. Still others¹⁹ have cautioned that predictive factors are specific to individual behaviors and that the health consequences of risk behaviors are best modeled individually. For youth injury, it is, therefore, unknown how behavioral risk factors should be optimally measured and considered in etiological models. If an additive scale is used, it is also not understood whether the numbers of risk behaviors engaged in are more important than the nature of the individual risks themselves. Smoking itself is one of the health risk behaviors and therefore a statistically significant association between all risk factors (including smoking) is not surprising. Rather than a result, an outcome or a consequence of the other health risk factors smoking and all other health factors emanate from, depend on or are conditioned by the trait of the habitual risk-taking as conduct and life style. The additive model paints a profile of the build-up attributed to the trait which may be known as 'ill-healthicism'.

The purpose of the present study was to describe the prevalence of cigarette smoking and to examine associations between risk behaviors and smoking among school students in grades 6, 8, 10 and 12. Health Behavior in School-aged Children, a World Health Organization cross-national study²⁰ provided the opportunity to explore these associations. Focused objectives of this national analysis were to examine (1) the strengths of associations between individual health risk behaviors and the occurrence of smoking between the West bank and Gaza Strip and (2) whether risks for youth injury increased in accordance with the number of risk behaviors identified in an additive scale. Such information would be of importance for identifying potential target groups and providing the necessary guidance for prevention.

Participants and methods

The 2004 Health Behavior among School-aged Children is a study of a nationally representative sample of adolescents in Palestine. The estimated population of Palestine in 2004 was 3,636,195 people.²¹ In the same year, the total number of children aged 10-14 and 15-19 was 481,294 and 383,287 respectively. The schooling system in Palestine is in two stages: basic stage that involves children aged of 6 to 16 years, and secondary stage that involves children aged 17 to 18 years. There were 2,192 schools operating in the Palestine (1,661 government, 273 United Nations Relief and Works Agency for Palestine Refugees (UNRWA) and 258 private) with a total number of 29,815 classes (21,262 government, 5,956 UNRWA, 2,597 private). The total number of children enrolled in grades 6th, 8th, 10th and 12th in the academic year 2003/2004 was 295,511 students. Students selected to be surveyed were chosen using stratified, two-stage cluster sampling.

The sample was stratified according to area (West Bank and Gaza Strip), school types (government, private and UNRWA) and school grades (6th, 8th, 10th and 12th). Assuming an average class size of 35 students, the aim was to recruit 2,000 students at each grade level, from both regions, to produce a sample size of 8,000 students. To allow for the effects on standard errors resulting from cluster sampling, the planned sample size was multiplied by a design effect equal to two.

A two-stage cluster sampling technique was implemented with the school as the primary sampling unit. In the first stage, 405 basic and secondary schools were selected randomly with probability proportional to their size (defined as number of classes). The list of the schools and number of classes in each school, for the academic year 2003/2004, was obtained from the Ministry of Education. In the second stage, one class was selected from each school. Each of these classes was defined as cluster, where all the students in the selected class were eligible for inclusion. The aim was to survey one class per school. However, in schools where boys and girls were studying in separate classes, two classes were selected, one for male and another for female. This resulted in a total of 481 classes being selected.

The tool used in this survey was based on the international version of the Health Behavior among School-aged Children questionnaire (1997/1998).²⁰ In the Palestinian survey, two versions of the questionnaire (A & B) were developed and used. Questions on demographic characteristics, health behaviors and lifestyles were included in both versions of the questionnaire while details on injury were sought only in version B of the questionnaire. The questionnaire was

split into two versions to enable the students to complete it in one school period.

For data collection a split sample approach was used, in which half of the children in each class were asked mandatory items plus optional questions about violence and injuries. The other half of the children were asked mandatory items plus optional questions about different health topics. The data were collected anonymously through self-completed questionnaires, which were distributed between April and May 2004. In each school, the student advisor distributed the questionnaires in the classroom and was instructed to respond to the students enquires about the procedure. School children completed the questionnaires independently during one school period lasting 45 minutes.

Full descriptions of the questionnaire items assessed during 2004 and their development appear elsewhere²². The final questionnaire used in this study consisted of 245 items (mandatory (92); A (77); B (76); total column A (169); B (168)). It was piloted on 300 students who were selected from an adolescent school that was not included in the main sample. Minor wording changes were made to clarify the meaning of certain questions. One question related to religion was omitted by the Ministry of Education.

The overall goal of the Health Behavior among School-aged Children study is to “gain insights into and to increase our understanding of health behaviors, lifestyles and context in young people. This occurs in part by identifying characteristics of youth that influence their health and well-being. Major categories of variables addressed in the survey include the following: demographics, general health and well-being, family and peer relationships, school environments, exercise and leisure-time activities, diet, smoking, exposure to political violence, and mental health.”²⁸

Smoking

The students' present smoking behavior^{23, 24} was measured by the item ‘How often do you smoke tobacco at present?’ (‘every day’, ‘at least once a week but not every day’, ‘less than once a week’, ‘I do not smoke’). The analyses included two classifications based on this item: ‘At all’ smokers comprised students who reported smoking every day, at least once a week or less than once a week. Outcome measures were the proportion of ‘at all’ smokers among girls and boys in the school class.

Multiple risk behavior score

A list of health risk behaviors common to adolescents, as suggested by the literature, was compiled from the

available questions in the Health Behavior among School- aged Children study. The following close-ended items were used (responses in parentheses were interpreted as the presence of the risk factor): Injury, ‘During the past 12 months, how many times were you injured and had to be treated by a doctor or nurse?’; seat belts,^{25,26} ‘How often do you use a seat belt when you sit in a car?’ (Never, rarely, or sometimes); bullying,²⁷ ‘How often have you taken part in bullying other students in school this term?’ (More than once or twice); excess time with friends,²⁸ ‘How many evenings per week do you usually spend out with your friends?’ (5-7 evenings); alienation at home,²⁸ ‘How easy is it for you to talk to your father/mother about things that really bother you?’ (Difficult or very difficult for all parents in the home); alienation at school,²⁸ ‘I feel I belong at this school.’ (Disagree or strongly disagree); truancy,²⁹ ‘How many days did you skip classes or school this term?’ (>2 days); and an unusually poor diet.³⁰ ‘How often do you eat or drink cola/sweets/potato chips or crisps?’ at least once a day for all 3); Physical activity. Students were asked whether during the preceding seven days they had engaged in vigorous physical activity (activities that made them sweat and breathe hard) for 20 min or more on three or more days or moderate physical activity (activities that did not make them sweat and breathe hard) for 30 or more min on five or more days. Some of the preceding factors were selected as risk behaviors that could be strongly associated with or directly leading to smoking. Others were selected as more generic indicators of a risk-taking lifestyle. The available risks were combined into an un-weighted multiple risk behavior frequency score. Because of their low relative frequency, scores from 5 to 9 were collapsed subsequently into a single category, leaving six levels (1 to >5 behaviors).

Covariates

Factors selected as potential confounders were class grade/age (in years), gender, socioeconomic status (five categorical responses to the following: ‘How well-off do you think your family is?’), region (West Bank or Gaza Strip, and, hours of sports activity or exercise per week outside of normal school hours (0 to >7).

Statistical analysis

Correlation analyses were used to examine the strengths of associations between individual risk factors contained in the multiple risk behavior score. Internal consistency analyses were performed, using Kuder-Richardson formula 20 (range, 0-1.0; with a score of >0.6 viewed,

conservatively, as acceptable) and computer software (Statistical Product and Service Solutions; SPSS Inc, Chicago, Ill). This was done to explore the reliability of the multiple risk behavior score and the individual high-risk behaviors used to construct the score.

The etiological analysis was conducted in two stages. First, unconditional logistic regression (the conventional form for unmatched data analyses) was used to examine each high-risk behavior (individually) as a potential risk factor for smoking. Second, the same analytical technique was used to examine the strength of associations between the additive risk score and smoking. For the individual risk behavior and additive score analyses, crude and adjusted odds ratios (ORs) and associated 95% confidence intervals were calculated for

each level of exposure compared with baseline (the referent level: multiple risk behavior score of 0). All data analyses were conducted using computer software SPSS 12 (Statistical Product and Service Solutions, version 12)

Results

An estimated 10.6% of students were current smokers, with great variation in prevalence by gender (boys 19.4%, girls 3.4%). Students aged 19 years (18.3%) were significantly more likely than younger students (11 years, 10.3%) to be current smokers. Government/private students (11.4%) were significantly more likely than UNRWA school students (5.7%) to be current smokers. Strong variations were also observed between West Bank (14.4%) and Gaza (7.2%) regions (Table 1).

Table 1. Number and percentage of current smokers among Palestinian school students in grades 6, 8, 10 and 12 by selected characteristics – Palestine

Gender	N	n	%	95% CI	P-Value ^a
Boy	8336	1621	19.4	18.6 - 20.3	0.000
Girl	9101	308	3.4	3.0 - 3.8	
Age					
11.00	351	36	10.3	7.1 - 13.4	
12.00	4190	329	7.9	7.0 - 8.7	
13.00	212	17	8.0	4.3 - 11.7	
14.00	3962	370	9.3	8.4 - 10.2	
15.00	515	66	12.8	9.9 - 15.7	0.000
16.00	3644	422	11.6	10.5 - 12.6	
17.00	552	72	13.0	10.2 - 15.9	
18.00	3449	514	14.9	13.7 - 16.1	
19.00	562	103	18.3	15.1 - 21.5	
Grade					
6th Grade	4541	365	8.0	7.2 - 8.8	
8th Grade	4545	441	9.7	8.8 - 10.6	0.000
10th Grade	4340	506	11.7	10.7 - 12.6	
12th Grade	4011	617	15.4	14.3 - 16.5	
Region					
West bank	9325	1344	14.4	13.7 - 15.1	0.201
Gaza	8112	585	7.2	6.6 - 7.8	
School type					
Public	14652	1738	11.9	11.3 - 12.4	
Private	610	66	10.8	8.3 - 13.3	0.000
UNRWA	2175	125	5.7	4.8 - 6.7	

^aP < 0.05 level

Strong and significant variations were observed between current smokers and those non-smokers for the following behaviors: number of times injured, being involved in physical fights, been bullied or bullied others, have

carried a weapon, spend excess times with friends, being alienated at home as well as school, an unhealthy diet, truancy, and to have thought about suicidality or attempted suicide (Table 2).

Table 2. Prevalence of smokers among school students in grades 6, 8, 10 and 12 by other risk factors [n (%)] – Palestine

	Smokers (n= 1929)	Non-Smokers (n= 15508)	P-Value^a
Times injured	989 (13.8%)	6184 (86.2%)	<0.000
physical fight	1297 (16.3%)	6642 (83.7%)	<0.000
Been bullied past two months	1077 (12.8%)	7323 (87.2%)	<0.000
Bullied others	1042 (18.4%)	4606 (81.6%)	<0.000
carried weapon last 30 days	990 (24.8%)	3000 (75.2%)	<0.000
Seat belt	782 (11.3%)	6108 (88.7%)	0.200
Excess time with friends	379 (33.1%)	767 (66.9%)	<0.000
Alienation at home	691 (12.4%)	4880 (87.6%)	<0.000
Alienation at school	381 (18.8%)	1641 (81.2%)	<0.000
Truancy	680 (35.5%)	1236 (64.5%)	<0.000
Unusually poor diet	433 (11.4%)	3356 (88.6%)	0.310

^aP < 0.05 level

Wearing seat belts and having an unhealthy diet, however, were not significant among current smokers. Furthermore, there was considerably less variation between grades in the numbers of health risk behaviors reported by youth.

Adjusted ORs that describe smoking associated with individual risk behaviors were all larger than unity (OR>1.0) except for being bullied and wearing seat belts (Table 3). Some risk estimates were even larger than 2

unity (OR>2.0) with slight variation between regions, namely: time spent with friends, bullied others, alienation at both home and school, suicide ideation and poor diet. Smoking increased in accordance with the multiple risk behavior score (Table 4). Because all crude ORs calculated were within the bounds of the associated adjusted confidence intervals, only adjusted ORs are presented in Tables 3 and 4.

Table 3. Logistic regression analysis examining associations between individual

		Palestine
Times injured	1.06	(0.85 - 1.32)
Times in physical fight	1.62	(1.28 - 2.06)
Been bullied past two months	0.93	(0.74 - 1.18)
Bullied others	1.44	(1.14 - 1.82)
Carried weapon (past 30 days)	2.13	(1.69 - 2.69)
Seat belt	1.21	(0.90 - 1.64)
Excess time with friends	1.93	(1.41 - 2.63)
Alienation at home	1.09	(0.88 - 1.36)
Alienation at school	1.29	(0.99 - 1.69)
Truancy	2.05	(1.61 - 2.63)
Unusually poor diet	1.24	(1.00 - 1.53)
Suicide ideation	2.34	(1.68 - 3.25)
Attempt suicide	0.90	(0.62 - 1.32)

*Data are given as adjusted odds ratio (95% confidence interval). The odds ratios were simultaneously adjusted for age, gender, socioeconomic status, and physical activity.

Table 4. Adjusted logistic regression analysis for health behaviors and smoking

Number of health risk factors - Palestine			
0	1.00		
1	1.20	(0.88	- 1.64)
2	1.63	(1.22	- 2.19)
3	2.52	(1.90	-3.35)
4	3.54	(2.67	- 4.71)
5+	6.87	(5.23-	9.02)

*Data are given as adjusted odds ratio (95% confidence interval). The odds ratios were simultaneously adjusted for age, gender, socioeconomic status, and physical activity.

These results suggest the presence of fairly strong associations between the additive risk score and smoking.

A graphical summary of the combined analysis of data from the two regions (Figure 1) shows the overall gradient in risk for smoking associated with the numbers of risk behaviors reported ($P < .001$ for trend). The risk gradients were also observed among male and female subjects and within each of the four school grades.

Discussion

The findings of the present study, which were based on the Palestinian Health Behavior among School-aged Children data⁶ examined smoking among school graders 6, 8, 10 and 12 in Palestine and showed that smoking was an important cause of adolescent morbidity in this country. The other major findings were that youth smoking increased in direct association with increasing frequency of reported risk behaviors. These gradients were observed within all demographic strata defined by grade and gender. The gradients were observed with and without adjustment for potential confounders, including indicators of socioeconomic status.

Our findings of a linkage between health-risk behaviors and smoking are consistent with previous research. For example, the US Surgeon General's report Preventing Tobacco Use Among Young People found that youth who smoke are more likely to drink alcohol, get into fights, carry weapons, attempt suicide and engage in high-risk sexual behaviors, and they are less likely to wear seatbelts.¹¹ Willard and Schoenborn¹² found a consistent association between smoking and other health-risk behaviors and Everett et al.¹⁴ found that, in general, tobacco-using students are more likely to engage in other substance use, unintentional injury risk behaviors and sexual risk behaviors. Additionally, Escobedo et al.¹³ found an association between smoking and binge drinking, as was found in the current study. Smoking itself is one of the health risk behaviors and therefore a

statistically significant association between all risk factors (including smoking) is not surprising. Rather than a result, an outcome a/or a consequence of the other health risk factors smoking and all other health factors emanate from, depend on or are conditioned by the trait of the habitual risk-taking as conduct and life style. The additive model paints a profile of the build-up attributed to the trait which may be known as 'ill-healthicism'.

Explanations vary as to why youth engage in risk behaviors. One reason is that risk-taking behavior represents a means by which independence can be asserted.³¹ The extent of this independence seeking is influenced by individual personality and cultural norms that imperil or protect the growing child.³² Personal behavior is influenced by peers, parents, the school, and the neighborhood in which the adolescents reside.³³ Normative behavior may be related to protective concepts of social capital, including social networks, civic responsibility, perceptions of resources, and local identity.³⁴ The ability to predict health outcomes, such as smoking from risk behavior alone, is tempered by these protective factors.³²

Risk behavior may also be of social benefit to the growing adolescent. Experimentation is normal and reflects a willingness on the part of the adolescent to move away from dependence on family to a peer orientation. Problem Behavior Theory and Primary Socialization Theory³⁵ postulate that adolescent risk-taking largely takes place within peer groups that provide a means of social support. Further understanding is required about the positive impacts of these social networks. The negative impacts of risk-taking lifestyles include elevated long-term risks for cardiovascular disease, cancer, and other debilitating illnesses. Our findings show that the general association between numbers of behaviors and smoking was consistently positive.

This activity occurs during a period in adolescence when youth are learning about themselves and others, and engage in risk behaviors together. Michaud et al.,

however, have argued that this approach, which commonly uses recognized models of explaining health-risk behaviors, while useful for population studies, may not translate to the individual level.³⁶ Youth are in great transition such that what might be true at one moment may be different at another and thus a model might not be useful. In addition, youth have different experiences and skills in addressing experimentation that so often comes with adolescence. These experiences and skills, particularly the ones which are protective against health-risk behaviors, are often overlooked in behavioral models.

Our analysis was unique in that we used a multiple risk behavior score to predict a negative health outcome: smoking. While the dimensions and structure of adolescent risk-taking behavior still need to be identified, it may be fruitful to include additional risk.

To have a beneficial impact on present and future smoking-related morbidity and mortality, underlying social issues such as unemployment and education need to be addressed when working to prevent youth from initiating smoking or to get youth and adults already smoking to quit. Additionally, programs shown to be effective in keeping youth smoke-free that also address accompanying health-risk behaviors should be implemented as part of a comprehensive program.¹¹ Such efforts are further advanced when targeted community programs that address the role of families, community organizations, tobacco-related policies, anti-tobacco advertising and other elements of adolescents' social environments are added.¹¹ A failure to address concurrent forms of risk behavior in interventions may lead to naive preventive strategies.

The present study has several limitations. First, as it was cross-sectional the authors could not identify temporal relationships between smoking and other health-risk behaviors. Second, these data apply only to youth who attended secondary school and thus, are not representative of all persons in this age group (e.g. secondary school students drop out rate is 4%),³⁷ thirdly, formal factor analyses were not used during its construction, and the measures of reliability conducted suggest that there is room for improvement. Correlation between types of behavior contained in the score also might not be sufficiently high to fulfill criteria for reliability when compared with the psychometric theory and associated standards. Lastly, information on smoking relied on self-reported data which suffers from recall bias meaning inaccuracy of information due to uncertainty or failure to recall the event. Yet, the associations were strong and consistent regionally, despite the fact that the

two regions varied in social and cultural factors that might influence reporting inaccuracies.

Conclusions

The associations between risk behavior and smoking are intriguing although it would be premature to suggest that they are causal. The observed associations were strong and statistically significant, followed a gradational pattern of risk, and were consistent with human theory that attests to their plausibility. The fact that the similar associations were found across regions and cultures provides evidence in support of a common etiology to these injuries. Furthermore, the strong and consistent nature of these associations suggests that the additive risk score model of risk behavior, while admittedly at an early stage of development, has promise. Based on these findings, we conclude that the issue of multiple risk behavior, as assessed via an additive score, merits attention as an etiological construct. The latter may be useful in future smoking prevention programs.

What the present study adds

Increases in adolescent risk-taking behavior have been reported internationally. The immediate health consequences associated with these behaviors are poorly understood although there is some suggestion that they lead to elevated risks for smoking. Whether this is a universal phenomenon is unclear.

The present study examined associations between adolescent risk-taking behavior and smoking among 17,437 adolescents in Palestine. Strong gradients in smoking were observed in association with the number of risk-taking behaviors reported. This was true for both regions and for all demographic subgroups and smoking examined. Based on these findings, we conclude that the issue of multiple risk behavior, as assessed via an additive score, merits attention as an etiological construct.

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References

1. Alberg AJ, Samet JM. Epidemiology of lung cancer. *Chest* 2003;123: 21S-49S.
2. Calverley PM, Walker P. Chronic obstructive pulmonary disease. *Lancet* 2003;362: 1053-61.
3. Burns DM. Epidemiology of smoking-induced cardiovascular disease. *ProgCardiovasc Dis* 2003; 46: 11-29.

4. Bonita R, Duncan J, Truelsen T, et al. Passive smoking as well as active smoking increases the risk of acute stroke. *Tob Control* 1999; 8: 156-60.
5. WHO. World Health Organization, 2006. Tobacco Free Initiative: Why is tobacco health a public health priority? www.who.int/tobacco/en/ (accessed 15 March 2006).
6. Tamim H, Musharrafieh U, El Roueiheb Z, et al. Exposure of children to environmental tobacco smoke (ETS) and its association with respiratory ailments. *J Asthma* 2003;40: 571-6.
7. Esobedo LG, Marcus SE, Hotzma D, Giovino GA. Sports participation, age at smoking initiation, and the risk of smoking among US high school students. *J Am Med Assoc* 1993;269: 1391-5.
8. Taioli E, Wynder EL. Effect of the age at which smoking begins on frequency of smoking in adulthood. *N Engl J Med* 1991;325: 968-9.
9. Wills TH. Stress and coping in early adolescence: Relationships to substance use in urban school samples. *Health Psychology* 1986;5: 503-529.
10. Torabi MR, Bailey WJ, Majd-Jabbari M. Cigarette smoking as a predictor of alcohol and other drug use by children and adolescents: evidence of the 'gateway drug effect'. *Journal of School Health* 1993;63: 302-306.
11. US Department of Health and Human Services. Preventing Tobacco Use among Young People: A Report of the Surgeon General. US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1994; Atlanta, GA.
12. Willard JC, Schoenborn CA. Relationship between cigarette smoking and other unhealthy behaviors among our nation's youth: United States, 1992. *Advance Data from Vital and Health Statistics* 263:1-11.
13. Escobedo LG, Reddy M, DuRant RH. Relationship between cigarette smoking and health risk and problem behaviors among US adolescents. *Archives of Pediatrics and Adolescent Medicine* 1997;151: 66-71.
14. Everett SA, Malarcher AM, Sharp DJ, Husten CG, Giovino GA. Relationship between cigarette, smokeless tobacco and cigar use and other health risk behaviors among US high school students. *Journal of School Health* 2000;70: 234-240.
15. Donovan JE, Jessor R. Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology* 1985;53: 890-904.
16. Anda RF, Croft JB, Felitti VJ, Nordenberg D, Giles WH, Williamson DF, Giovino G. Adverse childhood experiences and smoking during adolescence and adulthood. *Journal of the American Medical Association* 1999;282: 1652-1658.
17. Jessor R. Risk behavior in adolescence: a psychological framework for understanding and action. *J Adolesc Health* 1991;12: 597-605.
18. Enquist K, Edmundson E, Parcel G. Structure of health risk behavior among high school students. *J Consult Clin Psychol* 1995;64: 764-775.
19. Osgood D, Johnston L, O'Malley PM, Bachman JG. The generality of deviance in late adolescence: an eight year longitudinal study of a cohort of elementary school students. *Am Sociol Rev.* 2000;53: 81-93.
20. Currie CE. Health Behavior in School-aged Children: Research Protocol for the 1997-98 Survey. Edinburgh, Scotland: World Health Organization Coordinating Center for the Study of Health Behavior in School-aged Children; 1998.
21. Abdeen Z, Qasrawi R. Adolescent school children in Palestine: their health and well-being, Results of the First National Health Behavior among school aged children Survey 2004, The Al-Quds Nutrition and Health Research Institute, Al-Quds University Press; 2007.
22. Palestinian Central Bureau of statistics, 2000. Health Survey-2000, Ramallah, Palestine.
23. Galambos NL, Tilton-Weaver LC. Multiple-risk behavior in adolescents and young adults. *Health Rep.* 1998;10: 9-20.
24. Flisher AJ, Ziervogel CF, Chalton DO, Leger PH, Robertson BA. Risk-taking behavior of Cape Peninsula high-school students, part III: cigarette smoking. *S Afr Med J.* 1993;83: 477-479.
25. Tenn L, Dewis ME. An evaluation of Canadian peer-driven injury prevention programme for high-risk adolescents. *J Adv Nurs* 1998;23: 329-337.
26. Christoffel KK, Donovan M, Schofer J, Wills K, Lavigne JV, for the Kids'n'Cars Team. Psychosocial factors in childhood pedestrian injury: a matched case-control study. *Pediatrics* 1996;97: 33-42.
27. Bijur PE, Stewart-Brown S, Butler N. Child behavior and accidental injury in 11,966 preschool children. *AJDC.* 1986;140: 487-492.
28. King A, Wold B, Smith CT, Harel Y. The Health of Youth: A Cross-National Survey. Copenhagen, Denmark: World Health Organization, Regional Publications 1996; European Series 69.
29. Pritchard C, Cotton A, Cox M. Truancy and illegal drug use, and knowledge of HIV infection in 93,214 16 year-old adolescents. *J Adolesc* 1992;15: 1-17.
30. Kann L, Warren CW, Harris WA, et al. Youth risk behavior surveillance: United States, 1995. *J Sch Health* 1996;66: 365-377.
31. Blum RW, McNeely C, Nonnemaker J. Vulnerability, risk and protection. In: Fischhoff B, Nightingale EO, Iannotta JG, eds. *Adolescent Risk and Vulnerability*. Washington, DC: National Academy Press; 2001:50-72.
32. Jessor R. Risk behavior in adolescence: a psychosocial framework for understanding and action. In: Rogers DE, Ginzberg E, eds. *Adolescents at Risk: Medical and Social Perspectives*. Boulder, Colo: Westview Press; 1992; 19-34.

33. Millstein SG, Petersen AC, Nightingale EO, eds. Promotion of Health Behavior in Adolescence. New York, NY: Oxford University Press Inc; 1993.
34. Kawachi I, Kennedy BP, Lochner K, Prothrow-Stith D. Social capital, income in-equality, and mortality. Am J Public Health 1997;87: 1491-1498.
35. Oetting ER, Donnermeyer JF. Primary socialization theory: the etiology of drug use and deviance, I. Subst Use Misuse 1998;33: 995-1026.
36. Michaud PA, Blum RW, Ferron C. 'Bet you I will!' Risk or experimental behavior during adolescence? Archives of Pediatrics and Adolescent Medicine 1998;152: 224-226.
37. Palestinian Ministry of Education. Smoking among School children in Palestine. Ramallah, Palestine; 2005.

الملخص

الخلفية: تلعب العديد من السلوكيات الخطرة دوراً هاماً كأحد العوامل ذات العلاقة القوية بالتدخين لدى الشباب ، وبالرغم من أهمية هذه الملاحظة إلا أنه لم يتم دراستها في البلدان العربية. **الأهداف:** هدفت هذه الدراسة إلى التعرف على مدى قوة العلاقة بين السلوكيات الضارة بالصحة والتدخين بين فئة الناشئين و ربطها ببعض المتغيرات ، كمنطقة السكن (الضفة الغربية و قطاع غزة)، والصف، والجنس. وهل خطر التدخين يزيد بزيادة ممارسة السلوكيات الخطرة والضارة المختلفة. وقد أجريت الدراسة المسحية على طلبة المدارس الفلسطينية بالتعاون مع منظمة الصحة العالمية. و تكونت عينة الدراسة من 17,437 طالباً و طالبة من طلبة الصفوف السادس، والثامن، والعاشر والثاني عشر. **للتعامل مع البيانات، تم استخدام مقياس لعوامل التعرض للخطر تضمن:** الإصابات غير المقصودة، عدم استخدام حزام الأمان في السيارات، المشاركة في عراك جسدي، حمل سلاح في الأيام الثلاثين الأخيرة، التهريب أو تهريب الآخرين، المكوث لفترات طويلة مع الأصدقاء، الميل للوحدة في البيت والمدرسة، التهريب المدرسي، التغذية السيئة، التفكير بالانتحار، محاولة الانتحار، و قلة النشاط الجسدي. **النتائج:** بينت النتائج وجود علاقة بين التدخين و عدد انواع السلوكيات الخطرة، كما أن التدخين لدى الأطفال و الناشئين و الشباب الذين أفادوا بممارستهم و بتعرضهم لعدد أكبر من السلوكيات الخطرة (أكثر من 5 سلوكيات) كان أعلى ب 6.87 مرات بدرجة ثقة 95% تراوحت بين (5.23 – 9.02) مقارنة بأولئك الذين أفادوا بعدم تعرضهم لأي سلوك خطر (نسبة الترجيح المصححة كانت 1.0، 1.20، 1.63، 2.52، 3.54، 6.87 على التوالي). في الإجمال فإن النتائج تشير إلى ازدياد معدلات التدخين بازدياد الممارسة للسلوكيات الخطرة، كما أن تعدد السلوكيات الخطرة يستدعي الانتباه والاهتمام كسبب من أسباب التدخين. ويعتبر هذا المفهوم ذو أهمية في إعداد برامج مكافحة التدخين لدى الشباب.

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Comorbid Physical and Psychiatric Disorders among Elderly Patients: A Study at an Outpatient Clinic in Saudi Arabia

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تشارك الاضطرابات البدنية و النفسية في المرضى المسنين:

دراسة بإحدى العيادات الخارجية بالمملكة العربية السعودية

مصطفى عمرو، طارق توفيق امين ، اسامة السعيد

Abstract

B **background:** Increasing longevity and population aging are being accompanied by a higher prevalence of dementia, depression and other psychiatric disorders. However, psychiatric research among the elderly population in the Gulf region is relatively scant. **Aims:** This cross sectional study aimed to explore the demographic characteristics, physical comorbidities and the psychiatric profile of 412 patients, aged 60 years and over, attending the outpatient clinics at a tertiary care hospital in Saudi Arabia. **Method:** Older subjects and/or their caregivers were interviewed to collect demographic data followed by administration of the Structured Clinical Interview for psychiatric diagnoses, which is based on the DSM-IV. Physical comorbidities and their characteristics were recorded onto a data compilation form after thorough review of the patients' available health records. **Results:** Of the included sample, 63.8% had at least one medical comorbid condition; hypertension, diabetes mellitus and ischemic heart disease were the leading medical comorbid disorders found. Also, 31.6% were found to have at least one neurological comorbid condition; seizures, neuropathic pains and Parkinsonism were the most frequently reported. Thirty-three percent of the sample had at least one psychiatric disorder. The commonest identified disorders were anxiety disorders (31.3%), dementia (29.6%) and depressive disorders (26.3%). **Conclusion:** Both physical and psychiatric disorders are frequently encountered and interrelated among older patients attending tertiary care facilities. Of particular concern was anxiety which was the most prevalent type of psychiatric disorder. Clinicians should be particularly vigilant about anxiety disorders in addition to other common psychiatric disorders in the elderly such as depression and dementia.

Key words: Physical diseases, psychiatric disorders, comorbid physical and psychiatric disorders, elderly, Saudi Arabia.

Declaration of interest: None.

Introduction

The phenomenon of population aging which was defined as an increase in the median age of the population¹ is already a major social and health problem in developing countries. By the year 2025, the world will host 1.2 billion people aged 60 and over rising to 1.9 billion in 2050.² The same trend is also predicted in the Eastern Mediterranean Region (EMR), including Saudi Arabia. The proportion of the elderly population, defined as those aged 60 years and above³ to total population, was 5.8 % in 2000.¹ It is expected to reach 8.7% by the year 2025 and 15.0% by 2050.⁴

The median age of the Saudi populace is increasing with an estimate of approximately twenty years of increase in the average life span during the second half of the 20th Century.⁵ As a result of the rapid socio-economic growth and increased provision of health and other social services, there has been a decline in death rate. This implies an extension of the average life expectancy at birth suggesting an increase in the number of elderly

people in the community. As a consequence, the geriatric population has been steadily increasing and this rapid growth of the population of older people is a challenge to the psychiatric profession.⁶

Studies from developed and developing nations consistently show that although there is variation between countries, dementia and depression are the most common mental disorders in communities where older people reside with anxiety disorders, alcohol and other substance use disorders and psychoses being less common and less frequently studied.^{7,10} Rates of mental disorders tend to be higher in hospital outpatient clinics in part due to physical health problems being a major risk factor for mental disorders in late life.¹¹ Psychiatric research among the elderly population in the Gulf region is relatively scant in comparison with the western world.¹² Cognitive disorders and depression among older people have been studied,^{13,14} but other mental disorders in late life have received little attention. Over the last three to four decades, the Gulf society has been evolving

over a period of rapid urbanization, socioeconomic advancement, modernization and change in the quality of life¹⁴. It is inevitable that the integrity of nuclear and extended families will be affected by such quick and dramatic changes. Moreover, the shift in the family set up and society as a whole to a modern, more westernized and sophisticated life, will inevitably reflect in various ways on the welfare, health and prosperity of the older population.¹²

The aim of the present study was to explore the demographic characteristics, encountered types of physical comorbidities and the psychiatric profile of geriatric patients attending the psychiatry and neurology outpatient clinics of a tertiary hospital using a validated semi-structured diagnostic interview. We also sought to explore whether gender differences in prevalence of psychiatric disorders was similar to that noted in younger populations and in community-based elderly where mood, anxiety, and dementing disorders are more common among women while alcohol abuse and dependence are more common among men.^{13,15}

Subjects and Methods

The present study is a cross sectional study conducted in the outpatient clinics of Neurology and Psychiatry of King Fahd Hospital (KFH) from June 2007 to December 2011. The hospital is located in Al-Hofuf, Al-Hassa Governorate, Eastern province of Saudi Arabia, which is 350 km from Riyadh and covers an area of 534,000 km². The hospital serves a total population of approximately one million. The geriatric services are provided by KFH and a network of 53 primary health care centers (PHCCs). A non-probability sampling method was used where all patients who attended these outpatient clinics were approached. The inclusion criteria were those aged 60 years and over and provision of informed consent. The study was approved by the hospital authority as there was no research ethics committee.

The majority of the sample were illiterate (95.5%) and therefore had difficulties with written communication, which meant that interviewing the caregiver was mandatory in most of the domains examined. All subjects and/or caregivers were interviewed on demographic data (age, gender, level of education and income, marital state, employment status, current smoking or alcohol use, and living arrangement), sites and reasons of referral, self and prescribed medications. The following physical illnesses were queried - diabetes, hypertension, chronic obstructive pulmonary diseases (COPD), ischemic heart disease (IHD), osteoarthritis, visual or hearing difficulty, and neurological disorders.

These data were validated through reviewing of patients' health records via a pre-tested compilation data collection form.

A full clinical examination including physical, neurological and psychiatric examination was carried out followed by administration of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) Arabic version.¹⁶ SCID-I is a semi-structured interview for making the major DSM-IV Axis I diagnosis. It produces an efficient and user friendly instrument so that the advantages of structured interviewing can be applied in clinical settings. It is administered in a single sitting and takes one to three hours depending on the complexity of the psychiatric history and the skill and experience of the clinician. It is divided into seven diagnostic modules: mood, psychotic, substance abuse, anxiety, somatoform, eating and adjustment disorders.

The SCID does not include a section to assess the diagnosis of dementia; consensus diagnoses of dementia were assigned using DSM-IV criteria¹⁷ based on patient (and when possible family) responses to specific probe questions about age of onset, cognitive decline and related functional impairment based on scores on the Arab version of the standardized Mini-Mental State Examination (MMSE)¹⁸ and Activities of Daily Living (ADL) scale¹⁹ and also the Instrumental Activities of Daily Living (IADL) scale.²⁰ A diagnosis of current minor depressive disorder was assigned based on the SCID data, using the criteria proposed in the appendix to DSM-IV-TR (the diagnostic criteria are identical to those for major depression, except that a minimum of two symptoms rather than five are required, with one symptom necessarily being 'depressed mood' or 'diminished interest or pleasure').¹⁷

Data analysis

Data were entered and analyzed using SPSS 13.0 (Statistical Package for Social Science, SPSS Inc, Chicago, Ill, US) and Epi-Info 6 (Centers for Disease Control, Atlanta, Georgia, US). Categorical data were expressed using proportions, frequency and percentage, while numerical variables were reported using median, mean and standard deviations. Descriptive and inferential statistics were used appropriately; Chi-square, Z test and Fisher Exact were applied for categorical data for statistical comparisons. Odds ratios and 95% confidence intervals were also used for comparison when appropriate. For numerical dataset t-test and Mann Whitney test of significance were applied for comparison. Binary logistic regression model was generated to determine the possible predictors for the

development of psychiatric disorders (dependent variables) by inclusion of the socio-demographics and clinically relevant variables (independent variables). P value of < 0.05 was considered significant.

During the study period (2007-2011) a total of 412 patients were assessed for neurological and psychiatric evaluation mainly from Al-Hassa province (92.7%). The demographic and clinical variables are summarized in Tables 1-3.

Results

Table 1. Demographic profile of the included older Saudi Sample – Al Hassa

Characteristics	Total Patients (N=412) No. (%)
Gender	
Male	247 (56.0)
Female	165 (40.0)
Marital status	
Single	29 (7.0)
Divorced/widow	84 (20.4)
Married	299 (72.6)
Education	
Illiterate	382 (92.7)
Literate	30 (7.3)
Income	
Unsatisfactory	312 (75.7)
Satisfactory	100 (24.3)
Living arrangements	
Alone	26 (6.3)
With the family	386 (93.7)
Smoking	89 (21.6)

The mean age of the total sample was 66.6 years (SD 12.4; range 60-84), whereas the mean age of psychiatric cases was 68.3 years (SD=16.8; range 60-84) with no significant statistical difference. Of the included sample,

63.8% had at least one medical comorbid condition; hypertension, diabetes mellitus and ischemic heart disease were the leading medical comorbidities found.

Table 2. Reasons for referral and medications used among the included older Saudi Sample

Characteristics	Total Patients (N=412) No. (%)
- Reasons for referral:	102(24.8)
Sleep disorders	36(8.7)
Agitation	75(18.2)
Memory problems	86(20.9)
Motor abnormality	14(3.4)
Depression	14(3.4)
Psychotic symptoms	13(3.2)
Loss of consciousness	23(5.6)
Eating problems	40(9.7)
Sexual problems	22(5.3)
Others	
-Medications received: Self	
NSAIDs	282(68.4)
Laxatives	197(47.8)
Antacids	93(22.6)
Vitamins	73(17.7)
Others	14(3.4)
Prescribed	
Psychotropic medications	
Antiepileptic medications	142(34.5)

Cardiovascular drugs	50(12.1)
Anti-diabetic drugs	182(44.2)
Gastrointestinal drugs	107(26)
Analgesics	81(19.7)
Respiratory drugs	77(18.7)
Others	43(10.4)
	22(5.3)

Also, 31.6% were found to have at least one neurological parkinsonism were the most frequently reported. comorbid condition; seizures, neuropathic pains and

Table 3. Interrelationship between physical and psychiatric comorbidities among the examined older patients

Disorders	Total Patients (N=412) No. (%)	Psychiatric Cases (N=179) No (%)	Univariate analysis: Odds ratio (95% C.I)
Medical disorders			
At least one medical disorder	263 (63.8)	121(67.6)	1.34(0.87-2.06)
Diabetes Mellitus	107(26.0)	47(26.3)	1.03(0.64-1.64)
Hypertension	123(29.9)	64(35.8)	1.64(1.05-2.47)*
Ischemic heart disease	77(18.7)	34(19.0)	1.04(0.61-1.76)
Osteoarthritis	41(10.0)	21(11.7)	1.42(0.71-2.83)
COPD	34(8.3)	17(9.4)	1.33(0.65-2.83)
Visual impairment	141(34.2)	107(59.8)	1.10(0.72-1.66)
Hearing impairment	128(31.1)	56(31.3)	1.02(0.65-1.58)
Neurological disorders			
At least one neurological disorder	130(31.6)	60(33.5)	0.73(0.48-1.12)
Seizures	38(42.1)	16(8.9)	0.94(0.45-1.62)
Neuropathic pain	24(5.8)	8(4.5)	0.63(0.24-1.62)
Parkinsonism	33(8.0)	15(8.4)	1.09(0.51-2.36)
Ataxia	4(1.0)	2(1.1)	N/A
Headache	133(32.3)	31(17.3)	0.27(0.16-0.44)**
Falls	63(15.3)	38(21.2)	2.24(1.25-4.02)**

CI= Confidence Intervals,† Fisher Exact, * P <0.05, **P< 0.001.

Older patients with psychiatric disorders (n=179) were more likely to have hypertension and complaints of falls. Both subjects with neurological and/or psychiatric disorders were mainly referred by primary health care (PHC) and the predominant mental problem at

presentation was headache (P=0.001). They had also lower scores on MMSE, ADL, IADL than the total group (P=0.018, 0.010 and 0.013 respectively) as shown in Table 4.

Table 4. Scores on MMSE, ADL, and IADL in relation to the presence of dementia and psychiatric disorders

Scales	Older Subjects			Dementia		
	Non Psychiatric (N=233)	Psychiatric (N=179)	P value*	Present (N=)	None (N=)	P value*
MMSE	27.61±4.80	25.58±6.19	0.018	17.18±5.17	29.12±0.86	0.003
ADL	5.96±5.43	5.56±1.04	0.010	4.58±1.49	5.97±0.20	0.001
IADL	7.68±1.15	7.27±1.66	0.013	5.55±2.25	5.97±0.15	0.196

*Mann Whitney test

Prevalence for current individual Axis I mental disorders by gender is shown in Table 5. Overall, 32.6% of the sample had at least one psychiatric disorder. The most commonly identified disorders among the entire sample

were anxiety disorders (31.3%), dementia (29.6%) and depressive disorders (26.3%). There were no bipolar disorder cases. Generalized anxiety disorder was the most prevalent anxiety disorder affecting 20.7% of the

sample. Of the 53 subjects diagnosed with dementia, the majority (n = 30, 57%) had Alzheimer's disease while 25% had vascular dementia and 18% mixed Alzheimer and vascular dementia. The only statistically significant difference in prevalence between genders was that men had a trend toward a higher rate of dementia. In the dementia group, the onset of the disorder occurred on average 4.8 ± 3.7 years before the presentation (AD, $4.5 \pm$

4.0 , VD, 5.6 ± 4.0 , MD, 4.5 ± 2.17) whereas in the depression group it was 20.5 ± 11.77 , 24 ± 5.2 and 27.5 ± 7.1 for minor depression, major depression and dysthymia respectively. For schizophrenia and anxiety disorders the onset of the disorder occurred on average 35.9 ± 7.5 and 24.1 ± 8.5 years before presentation respectively.

Table 5. Psychiatric disorders among the psychiatric cases distributed by gender

Psychiatric Disorders	Male (N=101)	Female (N=78)	Total No. (%)	P value*
Dementia	39(73.5)	14(26.4)	53(29.6)	0.004
Alzheimer	21	9	30(16.7)	0.149
Vascular	10	3	13(7.3)	0.208
Mixed	8	2	10(5.6)	0.222
Depressive disorders	22(46.8)	25(53.2)	47(26.3)	0.168
Minor depression	17	21	38(21.2)	0.146
Major depression	1	2	3(1.7)	0.820
Dysthymia	4	2	6(3.4)	0.923
Schizophrenia	6(60.0)	4(40.0)	10(5.6)	0.923
Anxiety Disorders	30(53.6)	26(46.4)	56(31.3)	0.721
Generalized anxiety disorder	19	18	37(20.7)	0.608
Panic disorder	2	3	5(2.8)	0.768
Agoraphobia	2	1	3(1.7)	0.820
Social phobia	2	2	4(2.2)	0.804
Simple phobia	1	1	2(1.1)	0.594
Obsessive compulsive disorder	4	1	5(2.8)	0.534
Others	4(30.8)	9(69.2)	13(7.3)	0.099
Somatoform disorders	1	7	8(4.5)	0.027
Uncomplicated bereavement	1	2	3(1.7)	0.820
Benzodiazepine abuse	2	0	2(1.1)	-----

* **Z test for proportions**

The annual results of psychiatric cases were uniform during the period of 2007-2011. The scores on MMSE, ADL and IADL in both dementia and non-dementia groups were assessed with lower scoring on the MMSE and ADL in the dementia than in the non-dementia group ($P= 0.003$ and 0.001 respectively) (Table 4).

Two or more medical disorders were found in 49.7% of psychiatric cases compared to 37.3% of those without psychiatric disorders (Odds ratio=1.66, $P=0.011$). Also, it was found that two or more neurological disorders were found in 27.4% of psychiatric cases compared to 17.6% of those without psychiatric disorders (Odds ratio=1.77, $P=0.017$) (Table 3). Comorbid Axis I psychiatric diagnoses were found in 24 cases (13.4%). We examined the psychiatric comorbidity among elderly patients with generalized anxiety disorder owing to higher prevalence. Nineteen (51.4%) of the 37 patients

with generalized anxiety disorder had at least one other diagnosis, as did 13 (35.1%) with minor depression, four (10.8%) with somatoform disorders, and two (5.4%) with benzodiazepine abuse. Thirty-five (66%) patients with dementia had at least one other diagnosis; 22 had depressive disorders, nine had anxiety disorders and four had schizophrenia.

We undertook a logistic regression to examine predictors of psychiatric disorders among older patients. Those variables significant on univariate analysis were entered into the analysis. Independent predictors of psychiatric disorders included age ≥ 70 , unsatisfactory income, referral by other facilities and other primary health care centers and the presence of ≥ 2 medical comorbidities. Other variables which proved to be non-significant were gender, living arrangement, educational status, neurological problems (Table 6).

Table 6. Logistic regression model with independent predictors for psychiatric disorders among older patients

Correlates	Logistic regression model †			
	B Coefficient	Odds ratio	95% C.I	P value
- Gender: Males		1.0		
Females	.130	1.39	0.91-2.21	0.210
- Age (years):		1.0		
60 to 69				
≥ 70	.164	1.79	1.41-2.26	0.007
- Income:		1.0		
Satisfactory				
Unsatisfactory	.434	1.59	1.13-3.14	0.022
- Living arrangements:				
With family				
Alone	.112	1.0		
- Educational status:		0.93	0.39-2.22	0.351
Literate				
Illiterate	.098	1.0		
- Physical Comorbidity:		1.91	0.89-4.10	0.110
One or less				
More than one	.451	1.0		
- Neurological problems:		1.81	1.06-3.13	0.032
One or less				
More than one	.122	1.0		
- Referral site:		0.98	0.73-1.29	0.341
Primary care				
Others/self-referral	.269	1.0		
		1.77	1.40-2.34	0.012

C.I = Confidence Intervals, * P < 0.05, ** P < 0.001, † Constant= 14.33, Chi-square = 33.1, percent predicted = 67.3. -2 Log likelihood= 1710.36, Hosmer and Lemeshow test=6.42, P=0.601. R² (Cox and Snell for the model) =0.055

Discussion:

The present study included 412 patients attending neurology and psychiatric clinics in Saudi Arabia. Our findings suggested that older patients with psychiatric disorders are likely to be referred by other facilities other than PHC, had more physical disorders, such as hypertension and had lower scores on cognitive (MMSE) and behavioral tests (IADL).

The reasons for this could be speculated by difficulty in early recognition of psychiatric symptoms, such as sleep disorders, agitation, motor abnormality, depression, psychotic symptoms, eating and sexual problems when using a routine medical assessment by physicians in PHC.⁷ Secondly, there may be a lack of awareness about the population regarding psychiatric symptoms and the general assumptions of forgetfulness and memory problems during normal aging.⁸ Thirdly, there might be a possible concealing of cases by patients' relatives in response to the associated stigma of psychiatric disease in society.²¹ Finally, the use of cognitive screening in the routine evaluation of elderly people with cognitive problems is not a general rule in the medical practice.²² Thus, specialized medical care is only sought when

symptoms begin to exert an evident functional impact and other neuropsychiatric symptoms when the disease is already at a more advanced stage.²³

These findings elucidate the difficulty in performing early diagnosis of psychiatric disorders and explain in part the utilization of more drugs, such as antacids, vitamins and psychotropic medications as they have more severe form of diseases and high physical comorbidity and accordingly they consumed excessive quantities of these drugs when compared with patients in the total group.

On the other hand, whereas patients in the total group were more likely to be referred from PHC and had more complaints of headache, patients usually seek medical advice from the nearby PHC in the early stages of the disease and they are oriented about physical complaints such as headache.²¹

The patients were interviewed with a standardized psychiatric interview (SCID) to characterize the rate of major Axis I DSM-IV disorders. Rates of current Axis I DSM-IV disorders using the SCID were found to be common, affecting nearly one-third of the sample (32.6%). This rate of current Axis I disorders supports

findings from the study conducted by Lyness, Caines, Kings, Cox and Yoediono (1999)¹⁵ who found that in a group of 224 older primary care patients, 31.7% met the DSM-IV criteria for at least one psychiatric disorder at the time of the interview. Similarly, other studies in developing countries, e.g. Bikaner, India and developed countries, e.g. Boston, USA confirmed those findings.^{24,25}

Most but not all investigations about mental health in elderly populations have focused on cognitive and depressive disorders because they are the most common mental disorders. Comparatively less research has been devoted to characterizing the whole distribution of Axis I disorders, including anxiety disorders, psychoses or substance use disorders in the general population of elderly patients attending neuropsychiatric clinics.

The most commonly identified disorders among the entire sample were anxiety disorders (31.3%), dementia (29.6%) and mood disorders (26.3%) followed by other disorders (7.3%) and psychotic disorders (5.6%). This supports the findings of other relevant studies in identifying anxiety and cognitive impairment, mostly dementia as consistently common mental health problems among the elderly^{9, 15, 23}. Also, the prevalence of depression follows these conditions in many studies.⁹ However, the identification of dementia and psychotic disorders in a large proportion of our cases was due to there being no specialized geriatric medicine or memory clinic, so all cases would be referred to the neurology and psychiatry outpatient clinics.

Anxiety disorders are the most common psychiatric disorders in this elderly population. In the present study, the prevalence of all anxiety disorders was estimated at 31.3%, which appears to have been much higher than the prevalence estimated in previous studies. In a primary care setting, Lyness et al.¹⁵ reported that the overall prevalence rate for anxiety disorders was 1.5% while in a tertiary care psychiatric hospital using the same methodology in a sample of elderly Indian patients the rate for anxiety disorders among the studies sample was an estimated 8.41%.²⁶ A relatively recent community study in United Arab Emirates (UAE), another Arab country using the Automated Geriatric Examination for computer Assisted Taxonomy (AGECAT), indicated that the prevalence rate of anxiety was 5.6%.¹²

Ritchie et al. revealed that up to 30% of individuals will experience an anxiety disorder in their lifetime. The higher rate of anxiety disorders noted in the study is suggestive of the need for further rigorous research to identify the factors behind this observation. Perhaps in our study this could be explained on the basis of sample

bias. Second, the changes in lifestyle in all aspects, unemployment, lower income and poor education may have contributed directly or indirectly to this finding.

The findings of the present study are consistent with other studies that report the prevalence for depression in primary care settings ranged from 3.2% to 39.7%.²⁷ However, in a recent study based on the Geriatric Depression Scale, the prevalence of scores that were suggestive or indicative of depression was particularly high among hospitalized elderly Egyptians at 79.0%.²⁸ The reported figures from Saudi Arabia for the prevalence of depression among community dwelling elderly ranged from 17.5% in the Abha study to as high as 39% in a large community-based study involving all regions of the country.^{14,29} Probably this higher prevalence occurred because depressive symptomatology was described, and not the diagnosis of depressive disorder as in the present study. It may also be explained by the fact that depressed elderly in general have higher utilization of health care services and consequently more depressed elderly had been included in the study population as it was outpatient-based study. The present results from a verified standardized structured diagnostic interview have provided further insight to support some of the previous questionnaire based research, which found high frequencies of anxiety and depression in geriatric clinics in the Arab region.^{14,28} However, these studies using questionnaires could not distinguish between major depression, minor depression and dysthymic disorder.

Subjects with dementia (29.6%) were comparable to the 30% reported in an Australian general hospital psychiatry setting.¹⁰ However, it was much higher than the ratio previously reported among elderly Saudis by Ogunniyi *et al.* (1998)¹³ (2.1%). The higher prevalence may be because a larger proportion of the patients with organic mental disorders were being managed at the general hospital set up (e.g. King Fahd Hospital) and continued to be followed up in the outpatient clinics. Alzheimer's disease was the most frequent cause (56.6%) followed by vascular and mixed dementia (24.5, 18.9% respectively). This finding is similar to results observed in most studies carried out in outpatient clinics from tertiary facilities in various countries.^{8,22} A clear predominance of males was also observed. This is contrary to the findings of similar studies.^{7,23} These results may not reflect the true prevalence of dementia, of course. Women may not attend hospitals as frequently as men since, for cultural reasons, they are wholly dependent upon men to take them there. Furthermore, women in Eastern societies are thought to be more

tolerant of both physical and psychological pain than western women, which may be considered culturally normative for them.²¹

The psychiatric comorbidity (13.4%) noted in this study was congruent with the previous studies.^{9,15} Psychiatric comorbidity calls for more assessment of different psychiatric disorders in the elderly in addition to cognitive impairment and depressive symptoms.

In our study, vitamins were used by 17.7% of the elderly sample; one may be able to identify prescriptions of developing countries from those of developed countries by the presence of vitamins. Vitamins and minerals ranked third in a previous Saudi study, which makes it no exception to other developing countries. Furthermore, three of the 20 most frequently prescribed drugs in this study were vitamins. This may indicate that malnutrition is prevalent in Saudi Arabia or vitamins are overprescribed by physicians. The latter seems to be more likely.³⁰

Limitations

Several limitations of the present investigation should be recognized. Firstly, since the data are from a hospital situation, the findings cannot generalize to the community. Caution should be taken when interpreting some data from such a small number that at best reflects the pattern of hospital utilization, which can be affected by a variety of factors. Hence, the findings need to be confirmed by community-based studies. Second, inferences of causality cannot be accomplished because of the design of the present study (cross-sectional). Third, the Instrumental Activities of Daily Living (IADL) has not yet been translated and standardized for the Arab population. Finally, there were no data from the SCID diagnosis in community or primary care settings in Saudi Arabia for comparison.

In conclusion

Psychiatric disorders are common among older persons attending a tertiary care setting in Saudi Arabia. Primary care physicians must be particularly trained to detect the psychiatric disorders in the elderly, given the prevalence, medical and psychiatric comorbidity. Primary care providers would also need a brief, accurate screening test that could be applied during routine office visits. Further, tertiary care hospitals would benefit from having clinical assessment performed by specialists, such as a geriatrician or neurologist. Physicians also must remain mindful of the high prevalence of generalized anxiety disorder and minor depression while also recognizing that, thus far, there has been no empirical investigation

regarding response to specific treatment strategies. Studies such as these, as well as epidemiological investigations, are a very important to raise awareness of the proportion of different types of psychiatric disorders in Saudi Arabia that would ultimately enable the development of more specific prevention strategies and early diagnosis.

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References

1. Bloom DE, Canning D, Fink G. Implications of Population Aging for Economic Growth. Harvard Initiative for Global Health; 2011.
2. Elmadbouly MA, Abdelhafez AM. Assessment of Nutritional Status of Hospitalized Elderly Patients in Makkah Governorate. Pakistan Journal of Nutrition 2012; 11 (10): 886-892.
3. Jacobsen LA, Kent M, Lee M, and Mather M. America's aging population. Population reference bureau. February 2011. www.prb.org/pdf11/aging-in-america.pdf
4. Vincent GK, Velkoff VA. The next four decades: The Older Population in the United States: 2010 to 2050. U.S. Department of Commerce Economics and Statistics, May 2010. www.census.gov/prod/2010pubs/p25-1138.pdf
5. Al Gabban M. Implication of Changes in the Spatial Distribution of Elderly in Saudi Arabia. South-east Asian Conference on Ageing Kuala Lumpur, July 18, 2010. www.seaca2010.files.wordpress.com/2010/07/microsoft-powerpoint-saudi-elderly.pdf
6. Hafez G, Bagchi K, Mahaini, R. Caring for the elderly: a report on the status of care for the elderly in the Eastern Mediterranean Region. Eastern Mediterranean Health Journal; 2000 6: 636-643.
7. Limpawattana P, Sawanyawisuth K, Soonporani S, Huangthaisong W. Prevalence and recognition of geriatric syndromes in an outpatient clinic at a tertiary care hospital. Asian Biomedicine; 2011, 5: 493-497.
8. Norlaily H, Azidah AK, Asrenee AR, Rohayah H, Juwita S. Proportion of Dementia and its Associated Factors Among Elderly Patients Attending Outpatient Clinics of Universiti Sains Malaysia Hospital. Medical Journal of Malaysia; 2009, 64:140-145.
9. Ritchie K, Artero S, Beluche I, Ancelin ML, Mann A, Dupuy AM, et al. Prevalence of DSM-IV psychiatric disorder in the French elderly population. British Journal of Psychiatry; 2004 Feb 184:147-52.
10. Draper B. The elderly admitted to a general hospital psychiatry ward. Australian and New Zealand Journal of Psychiatry; 1994 28: 288-97.
11. DE Hert, M, Correll, CU, Bobes J, Cetkovich-Bakmas M, Cohen D, Asai I, et al. Physical illness in patients with

- severe mental disorders. I. Prevalence, impact of medications and disparities in health care. *World Psychiatry*; 2011 10: 52-77.
12. Ghubash R, El-Rufaie O, Zoubeidi T, Al-Shboul QM, Sabri SM. Profile of mental disorders among the elderly United Arab Emirates population: sociodemographic correlates. *International Journal of Geriatric Psychiatry*; 2004 19: 344-51.
 13. Ogunniyi A, Daif AK, Al-Rajeh S, AbdulJabbar M, Al-Tahan AR, Al-Bunyan M, et al. Dementia in Saudi Arabia: experience from a university hospital. 1998, 98:116-20.
 14. Al-Shammari SA, Al-Subaie A. Prevalence and correlates of depression among Saudi elderly. *Journal of Geriatric Psychiatry*; 1999 14: 739-47.
 15. Lyness JM, Caine ED, King DA, Cox C, Yoediono Z. Psychiatric disorder in old primary care persons. *Journal of General Internal Medicine*; 1999 14: 249-254.
 16. Shaker N, El-Mahalawy N, Seif El-Dawla, Hasaein S, Nagy, N. Psychiatric disorders in children and adolescents with type 1 diabetes mellitus. MD thesis. Institute of Psychiatry, Ain Shams University; 2003.
 17. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Text Revision (DSM-IV). Washington, DC: American Psychiatric Press; 1996.
 18. Al-Rajeh S, Ogunniyi A, Awada A, Daif A, Zaidan R. Preliminary assessment of an Arabic version of the Mini-Mental state examination. *Annals of Saudi Medicine*; 1999 19(2): 150-2.
 19. Nasser R, Doumit J. Validity and reliability of the Arabic version of activities of daily living (ADL). *BMC Geriatrics*; 2009 Mar 29(9): 11.
 20. Lawton, MP, Brody, EM. Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist*; 1969 9: 179-186.
 21. Al-Sabie, A. Psychiatry in Saudi Arabia: Cultural perspectives. *Trans-Cultural Psychiatric Research Review*; 1989 26: 245-262.
 22. Godinho C, Gorczewski L, Heisler A, Cerveira MO, Chaves ML. Clinical and demographic characteristics of elderly patients with dementia assisted at an outpatient clinic in Southern Brazil. *Dementia Neuropsychology*; 2010 4: 42-46.
 23. Tascon El dos S, Marques Rde C, Pereira EC, Bottino CM. Characteristics of patients assisted at an ambulatory of dementia from a university hospital. *ArqNeuropsiquiatr*; 2008 66: 631-5.
 24. Singh VB, Nayak KC, Kataria DK, Verma SK, Jain P Sidhu D, et al. Psychiatric Co-morbidities in Patients Attending Geriatric Clinic at a Tertiary Care Hospital. *Journal of the Indian Academy of Geriatrics*; 2005 1: 65-69.
 25. Barrett JE, Barrett KA, Oxman TE. The prevalence of psychiatric disorders in a primary care practice. *Archives of General Psychiatry*; 1988 45: 1100-06.
 26. Seby K, Chaudhury S, Chakraborty R. Prevalence of psychiatric and physical morbidity in an urban geriatric population. *Indian J Psychiatry*; 2011 Apr 53(2): 121-7.
 27. Chang-Quani H, Xue-Mei Z, Bi-Rong D, Zhen-Chan L, Ji-Rong Y, Qing-Xiu L. Health status and risk for depression among the elderly: a meta-analysis of published literature. *Age and Ageing*; 2010 39: 23-30.
 28. El Kady HM, Ibrahim HK. Depression among a group of elders in Alexandria, Egypt. *East Mediterr Health J*; 2013 Feb 19(2): 167-74.
 29. Bawazir SA. Prescribing patterns of ambulatory care physicians in Saudi Arabia. *Annals of Saudi Medicine*; 1993 13(2): 172-173.
 30. Abolfotouh MA, Al-Alwan IA, Al-Rowaily MA. Prevalence of Metabolic Abnormalities and Association with Obesity among Saudi College Students. *International Journal of Hypertension*; 2012, Article ID 819726, 8 pages

المخلص

الخلفية: يرتبط زيادة طول العمر وشيخوخة السكان بارتفاع معدل انتشار الخرف والاكتئاب والاضطرابات النفسية الأخرى. ومع ذلك، فإن الأبحاث النفسية بين المسنين في منطقة الخليج تعتبر نادرة نسبياً. الأهداف: تهدف هذه الدراسة المقطعية لاستكشاف الخصائص الديموغرافية والنفسية في 412 مريضاً أعمارهم 60 عاماً أو أكثر من المترددين على العيادات الخارجية في مستشفى رعاية نهائية في المملكة العربية السعودية. **الطريقة:** أجريت مقابلات مع جميع المرضى وأقدمي الرعاية لجمع البيانات عن البيانات الديموغرافية وعوامل الخطر المحتملة وتبعها إدارة المقابلة السريرية المنظمة لتشخيص الأمراض النفسية التي استندت على الدليل الإحصائي الأمريكي الرابع المعد لتشخيص الأمراض النفسية. **النتائج:** وجد أن ثلاثة وثلاثون في المئة من العينة يعاني من اضطراب نفسي واحد على الأقل. وكانت الاضطرابات الأكثر شيوعاً التي تم تحديدها اضطرابات القلق (31.3٪)، والخرف (29.6٪)، والاكتئاب (26.3٪). **الخلاصة:** تعد الاضطرابات النفسية والقلق بشكل خاص، شائعة بين كبار السن في مرافق الرعاية النهائية وينبغي أن يتحلى الأطباء باليقظة بشكل خاص لإضطرابات القلق، بالإضافة إلى غيرها من الاضطرابات النفسية الشائعة لدى كبار السن مثل الاكتئاب والخرف.

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Attitude of Primary Healthcare Physicians to Mental Illness in Bahrain

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موقف أطباء الرعاية الصحية الأولية من المرض النفسي في البحرين
صديقة حسين المير، شارلوت عوض كامل، علي محمد الفرج، إيميلي عوض كامل

Abstract

B **ackground:** Primary care physicians (PCPs) are the front line treatment providers in Bahrain. They provide care to patients with various medical conditions, including mental health problems. This is the first study to examine the attitudes of PCPs toward psychiatrically ill patients to be done in Bahrain. **Objectives:** To assess the attitude of PCPs towards psychiatrically ill patients in Bahrain and their management. **Methods:** A self-administered questionnaire was distributed to all PCPs working in Ministry of Health primary care centers. This cross-sectional survey collated demographic details, occupational variables and the responses of physicians to 25 statements regarding the management of mentally ill patients. **Results:** There was a positive, albeit varying, response by primary care physicians to most of the items on the questionnaire. For instance, female PCPs reported having less difficulty talking sensibly with someone who is mentally ill than male PCPs. In contrast to female PCPs, male PCPs are more likely to believe that mental illness is not inherited. The report also indicates that PCPs who have completed the Family Physicians Residency Programme (FPRP) are less likely to refer every psychiatric patient to a hospital specialist than General Practitioners (GPs). The term GP refers to those who were not involved with the FPRP program as of the time of this survey. **Conclusion:** Although an overall positive attitude was found towards the mentally ill, as assessed by this questionnaire, several of the items reporting negative attitudes may need to be considered in the future planning of psychiatric training programs for primary care physicians.

Keywords: Mental disorders-therapy; attitude of health personnel; primary health care; physicians, family; Bahrain.

Declaration of interest: None.

Introduction

In 2001, the World Psychiatric Association initiated a global program to tackle the stigma and discrimination associated with schizophrenia.¹ In fact, in many countries the majority of mental health services are provided by primary care or GP surgeries.

The stigma, which consists of a negative attitude towards mentally ill patients, is a common phenomenon not only among the general public, but also among healthcare service providers. Many healthcare professionals consider that caring for people with serious mental illnesses is too highly specialized to be part of primary care. However, most patients view family physicians as the main providers of their healthcare and prefer to consult with them rather than be referred to a different physician with specific mental health knowledge.^{2,3} This and other reasons highlight the important role played by primary care physicians in helping to deal with the stigma of mental illness.

In Bahrain, as in many other countries, primary care physicians (PCPs) constitute the first point of contact for people with mental health problems and thus the impression that they, the physicians, leave with mentally

ill patients and their caregivers may affect the entire image of mental health services.

A recent study found that many persons with serious psychiatric conditions could benefit from available treatments, but do not receive care. The barriers are generally understood to be limited knowledge, inadequacies in insurance coverage, and stigma.⁴

The investigators concluded that improving the attitude and knowledge of PCPs about mental health was likely to have a positive impact on patient care; help the integration of patients within the community, and may help decrease the stigma associated with mental illness.

In addition to medical practitioners, family members, friends, the general public, and employers, may harbor and express negative attitudes about mental health. These stigmatizing attitudes toward the mentally ill can represent major obstacles for social re-integration and yet can play an important role in the rehabilitation process. The extent of the stigma can vary, depending on not only the diagnosis or individual mental health condition, but also the cultural and sociological background of each society.⁶ People with psychosis or drug dependence are more likely to report feelings and experiences of stigma

and are therefore more likely to be affected by them. The associated stigma may influence how a psychiatric diagnosis is accepted, whether treatment will be adhered to and how people with mental illness are able to function in their surroundings. However, perceptions of mental illness and diagnoses can be helpful and non-stigmatizing for some patients, particularly if they occur in settings outside mental health institutions such as primary care⁷.

The first step towards improving this attitude is an evaluation of the causes behind such attitudes. A number of studies have shown that there are misconceptions and other difficulties facing primary care physicians in the care of the mentally ill.⁶ Some of these are directly related to the concerns about risks of violence and the view that psychiatric patients are difficult and non-rewarding to treat. The referral or non-referral decisions of physicians may also be based on a myriad of factors including: non-recognition of the extent of psychiatric morbidity, stigma, the effect of referral on the self-esteem of the individual, uncertainty of the benefits of referrals, and difficulty in accessing psychiatric services.⁸ In addition, there may be other views held by primary healthcare physicians, shared by the public, to which the stigma might be attributed.

The objective of the present study was to identify key contributory factors through an assessment of the attitudes and reactions of primary care physicians towards mentally ill patients. We hope that such a focus will help improve the attitude towards such groups of patients, and therefore promote a better standard of care.

Methods

This was a cross-sectional survey using a questionnaire designed by the authors. A pilot study, which involved 10 clinicians, was conducted in an attempt to identify ambiguities.

All of the respondents were GPs and family physicians (collectively named here as PCPs) working in the primary health care services of the Ministry of Health in the Kingdom of Bahrain. The target population consisted of all 387 family physicians and GPs distributed in the country's 22 health centers at the time of the study in Jan 2010. In Bahrain, the term family physician refers to primary care physicians who are in, or are graduates of, a family physicians training residency program (FPRP), while the term GP refers to those who were not involved with the program as of the time of this survey. FPRP is at present the only program provided to support the basic training of primary care physicians. Primary care practice in Bahrain is based on family practice.

The questionnaire sought information on participants' demographic and occupational status, i.e., age, gender, and marital status, duration of practice, and previous psychiatric training and qualifications. The main part of the questionnaire consisted of 25 statements, which were assessed using a 5-point Likert-type scale with responses ranging from 'strongly agree' to 'strongly disagree'. This instrument was used to evaluate the physicians' attitudes toward the mentally ill patients attending primary care on individual items.

The statistical package, SPSS version 12.0 for Windows, was used for data management and analysis, and the level of confidence was set at a P-value of <0.05.

Simple frequencies were computed for the demographic data, and because the responses to the specific 25 questions constituted ordinal data, parametric statistics were used. The Chi-square test (X^2) was used to evaluate comparisons between groups.

Results

A total of 303 primary care physicians (PCPs) completed the questionnaire. Of these 81% were Bahraini.

Demographic characteristics

Of the PCPs enrolled, females constituted 62.7% while males constituted 37.5%. Nearly three fourths of the group (73.1%) were less than 45 years of age, while 26.9% were older. Around half (51.5%) of the respondents were between 35 and 44 years of age. Almost all (98%) were below 55 years of age. Most of the respondents were married (94.2 %), 90.6% of females and 97.4% of males.

Occupational characteristics

Only three respondents (2.9%) held a certificate in psychiatry. Two-thirds (65%) were either already qualified family physicians or enrolled in the Family Practice Residency Program. The group represents physicians at different levels of experience. Fifty-three percent of the respondents had < 10 years' experience, while 47% had > 10 years' experience. More than a quarter (28%) of respondents had not done any psychiatric training residency, and the vast majority (90%) of those who had, had less than six months of residency training in psychiatry. Physicians who had close personal contact with one or more psychiatric patients, as either relatives or friends, represented 46.6% of the sample.

Response to the attitude items of the questionnaire

Statements were divided into those that indicate a positive or favorable attitude (1, 8, 10, 11, 12, 18, 21, 22, 24, and 25) and those considered indicators of a negative

or unfavorable attitude. Table 1 shows the descriptive statistics of agreement and disagreement for individual items of the attitude questionnaire.

Table 1. Degree of agreement & disagreement to questionnaire statements (agreement includes agree and strongly agree answers; disagreement includes disagree and strongly disagree answers)

#	Statement	Agreement %	Undecided %	Disagreement %
1	يسعدني وجود مريض نفسي ضمن قائمة مرضاي. I feel pleased to have a psychiatric patient on my patient's list	57.5	12.9	29.8
2	يحتاج المريض النفسي إلى فترة معاينة أطول من باقي المرضى. A psychiatric patient needs more time on check-up than the other patients	96.1	1.9	1.9
3	أفضل تحويل المريض النفسي إلى أخصائي نفسي. I would rather transfer the psychiatric patient to a psychiatrist	15.7	5.1	78.4
4	يكون المريض النفسي عنيفاً في أغلب الأحيان. A psychiatric patient is often violent	31.7	7.9	60.4
5	لا يستجيب المريض النفسي لنصائح الطبيب أو لا يداوم على أخذ العلاج. A psychiatric patient does not respond to the doctor's advice / does not take medicine regularly	29.4	12.7	57.9
6	لا توجد وقاية من الأمراض النفسية كما هو الحال بالنسبة للأمراض الأخرى. Unlike other diseases, there is no prevention for psychiatric disorders	25.5	13.7	60.8
7	لا يتعاطى المريض النفسي المخدرات أو المشروبات الكحولية في الغالب In most cases, a psychiatric patient neither takes drugs nor drinks alcohol	12.7	13.6	73.8
8	يثير المريض النفسي تعاطفي معه أكثر من باقي المرضى. I feel more sympathy with a psychiatric patient than with the other patients	67.5	14.3	9.1
9	لا أستطيع في الغالب التعامل مع المريض النفسي بشكل منطقي وعقلاني بحت. I often can't deal with the psychiatric patient in a completely logical and rational way	10.8	13.7	75.5
10	لا أتردد في وصف أدوية العلاج النفسي للمرضى النفسيين. I would not be hesitant to subscribe psychiatric medications for the psychiatric patients	66.6	16.7	16.7
11	يسعدني توفير جلسات علاجية للمرضى النفسيين. I would be pleased to provide the psychiatric patients with therapy sessions	82.6	12.6	4.9
12	غالباً ما أشخص الأمراض النفسية في حالة هيجان المريض. I often diagnose the psychiatric diseases while the patient is agitated	34.7	17.8	47.6
13	احتمال شفاء المريض النفسي من مرضه ضعيف. The possibility of recovery for the psychiatric patient is weak	13.6	5.8	80.6
14	لا يستطيع طبيب العائلة أن يدعم المريض المزمن نفسياً. A family doctor can't support the chronic psychiatric patient	11.7	7.8	80.6
15	الشخصيات التي توصف بأنها ضعيفة هي الأكثر عرضة للإصابة بالأمراض النفسية. Characters known as weak are most likely to get psychiatric illness	7.8	12.6	87.7
16	لا يوجد علاج دائم ونهائي لمعظم الأمراض النفسية. Most psychiatric disorders do not have a permanent and final treatment	17.8	8.5	73.2
17	يجب أن يتلقى المريض النفسي علاجه في المصحات النفسية فقط لا في المراكز الصحية. A psychiatric patient should be treated only at psychiatric hospitals rather than health centres	20.4	5.8	73.8

18	الظروف الحياتية الصعبة هي من أبرز مسببات الأمراض النفسية. The hardships of life are the main cause of psychiatric disorders	85.4	7.8	6.8
19	شعور المريض النفسي بالألام الجسدية أقل من غيرهم من الأسوياء نفسياً. A psychiatric patient does not feel bodily pains as much as the normal persons	11.9	8.9	79.2
20	أشجع المريض النفسي على عدم الإنجاب. I would not encourage the psychiatric patient to have children	8.9	24.8	66.3
21	لا يولد المرض النفسي عند الإنسان لكن يظهر عليه لاحقاً Man is not born with a psychiatric disorder it appears later in his life	47.5	24.2	28.3
22	الأمراض النفسية لا تنتقل بالمعايشة وهي ليست معدية. Psychiatric disorders do not transmit with sex. They are not contagious	44.5	37.6	2
23	يفقد المريض النفسي ذكاؤه تدريجياً نتيجة لمرضه. As a result of his illness, a psychiatric patient gradually loses his intelligence	39.2	18.6	6.9
24	من الممكن اكتساب الأمراض النفسية. Psychiatric disorders are acquired	86.2	5.9	2
25	من الممكن أن تكون الأمراض النفسية وراثية Psychiatric disorders can be genetic	86.4	6.8	1.9

The overall attitude of different subgroups of PCPs was examined. Socio-demographics (age, gender, and nationality) and occupational profile (qualifications, experience, and psychiatric residency) were used as independent variables. Most of the group and the subgroups had a favorable attitude towards psychiatric patients as shown by positive responses to the majority of items. However, the only subgroup that had a 100.0% favorable attitude, i.e., agreement with all favorable items, was the group of primary care physicians with a psychiatric qualification or certificate.

This group, however, was comprised of only three PCPs. It was observed that the majority of PCPs agreed with statements #2, 11, 18, 24, and 25. They considered that psychiatric patients are likely to take up a lot of time (statement #2, 96.1%); however, they would be willing to provide counseling for psychiatric patients (statement #11, 82.6%). They believed that psychiatric illnesses can

be acquired (statement #24, 86.2%); and can be caused by adverse life circumstances (statement #18, 85.4%).

The majority also believed that it can be inherited (statement #25, 86.4%).

PCPs did not believe that only weak personalities are prone to psychiatric illnesses (statement #15, 87.7%). They disagreed that psychiatric patients have a poor prognosis whatever is done for them (statement #13, 80.6%); and that there is nothing family physicians can do about patients with chronic mental disorders (statement #14, 80.6%).

Factors effecting attitude and response to individual items

Male PCPs are more likely to believe they can't talk sensibly with someone who has been mentally ill than female PCPs ($X^2=10.012$, $df=4$, $p=0.040$). Female PCPs are more likely to believe that mental illness is inherited ($X^2=9.856$, $df=4$, $p=0.043$).

Table 2. Statistically significant associations between the following variables and individual items

Variable	Statements	X ² (P value)
Gender	9. I often can't deal with psychiatric patient in a completely logical and rational way	10.012 (0.040)
	21. Man is not born with a psychiatric disorder; it appears later in his life.	9.856 (0.043)
FPRP versus not	3. I would rather transfer the psychiatric patient to a psychiatrist	18.268 (0.001)
	7. In most cases, a psychiatric patient neither takes drug nor drinks alcohol.	10.336 (0.035)
	14. A family doctor can't support the chronic psychiatric patient	17.112(0.002)
	17. A psychiatric patient should be treated only at psychiatric hospitals rather than health centres	14.950(0.005)
	19. A psychiatric patient does not feel bodily pains as much as the normal persons	26.331 (0.000)

Experience in psychiatry	14. A family doctor can't support the chronic psychiatric patient	31.882 (0.001)
	17. A psychiatric patient should be treated only at psychiatric hospitals rather than health centres	23.373 (0.025)
Experience in PHC	7. In most cases, a psychiatric patient neither takes drug nor drinks alcohol.	28.562 (0.005)
	19. A psychiatric patient does not feel bodily pains as much as the normal persons	22.415 (0.033)
Patient contact	12. I often diagnose the psychiatric disorder while the psychiatric patient is agitated.	11.313 (0.023)
	13 The possibility of recovery for the psychiatric patient is weak	9.255 (0.055)

PCPs undergoing, or those who have completed, FPRP are less likely to refer every psychiatric patient to a hospital specialist ($X^2=18.268$, $df=4$, $p=0.001$); they also noted that psychiatric patients are unlikely to take illegal drugs, or drink alcohol in excess ($X^2=10.336$, $df=4$, $p=0.035$); and they reported that there is nothing family physicians can do about patients with chronic mental disorders ($X^2=17.112$, $df=4$, $p=0.002$). They were also more likely to consider that pain perception by psychiatric patients is less than normal ($X^2=26.331$, $df=4$, $p=0.000$). However, they were less likely to have the view that treatment of psychiatric illnesses needs to be at a psychiatric hospital and not in health centers ($X^2=14.950$, $df=4$, $p=0.005$).

The simple fact of having a psychiatric qualification does not explain attitude differences with regard to any of the items on the questionnaire. The less experience PCPs have in psychiatry, the more likely they are to believe that there is nothing they can do about patients with chronic mental disorders ($X^2=31.882$, $p=0.001$) and that people with psychiatric illnesses need treatment at psychiatric hospitals and not in health centers ($X^2=23.373$, $p=0.025$).

PCPs with more than 10 years' experience in primary care are more likely to think that psychiatric patients are unlikely to take illegal drugs, or drink alcohol in excess ($X^2=28.562$, $df=12$, $p=0.005$) than the less experienced PCPs. They are also more likely to believe that psychiatric patients' feeling for pain is less than normal ($X^2=22.415$, $df=12$, $p=0.033$).

With regards to close contact with people with mental illness, PCPs without a close contact with a person with mental illness are more likely to believe that mentally ill patients often come to the attention of their family physician only when there is a crisis ($X^2=11.313$, $df=4$, $p=0.023$). On the other hand, PCPs with a close contact with a person with mental illness are more likely to believe that psychiatric patients have a poor prognosis whatever is done for them ($X^2=9.255$, $df=4$, $p=0.055$).

No statistically significant differences were identified between the other independent variables considered here and other questionnaire items, using the chi-square test and Fisher's exact test.

Discussion

Before and during the period of the study in Bahrain, PCPs worked fewer on-call duty hours than other sub-specialties. There was evidence of limited psychiatric residency experience in the sample because the FPRP involved a rotation of only 2 months in psychiatry.

Relatively high prevalence of PCP contact with psychiatric patients may be because Bahrain is a small country with a very high population density. Furthermore, mental illnesses are relatively common.⁵ It has been shown in several studies that there is a positive association between knowledge about mental disorders and the attitude towards them.^{9,10,11} The accumulated knowledge across the different subgroups of primary care physicians could explain the positive attitudes of PCPs towards developing closer links at their work settings with psychiatrists.

The high scores of answers to statements #11, 15, 18, 24 and 25 and to statements #13 and 14 indicate a comprehensive and favorable awareness of the aetiology and prognosis of mental illness. It is interesting to note that the responses to statement #9 show that female PCPs were more likely to believe that they can talk sensibly with someone who has been mentally ill, and close contact with mentally ill persons appears to have a negative effect on how PCPs view the prognosis for psychiatric illnesses.

Experience and qualifications appear to improve attitude and knowledge towards mental illness, but prolonged experience in primary care on its own is not enough. PCPs require additional training to improve their views about psychiatry. As psychiatry, like other medical fields, is developing all the time, it is important for PCPs to have continuous professional developmental activities

in mental health to keep up to date with the knowledge in the field.

The present study has several limitations. Only direct questions were used and other related factors may not have been taken into consideration. Moreover, it is likely that semi-structured interviews might illuminate additional barriers to best practices for mentally ill patients in the primary care setting. The two-month training program provided within the FPRP in the Psychiatric Hospital is helpful, but it is not enough to ensure a better attitude and management of mental illness.

References

1. World Psychiatric Association. The WPA global programme to reduce the stigma and discrimination because of schizophrenia-an interim report 2001. World Psychiatric Association: Geneva; 2001.
2. Lester H, Tritter JQ, Sorohan H. Patients and the health professionals views on primary care for people with serious mental illness: focus group study. *BMJ* 2005;14: 330(7500): 1122.
3. Beacham A, Herbst A, Streitwieser T, Scheu E, Sieber W. Primary care medical provider attitudes regarding mental health and behavioural medicine in integrated and non-integrated primary care practice settings; *J ClinPsychol Med Settings* 2012;19: 364-375
4. Mechanic D. Removing barriers to care among persons with psychiatric symptoms. *Health Affairs* 2002;21(3): 137-147
5. Mirkin B. United Nations Development Programme Regional Bureau for Arab States Population Levels, Trends and Policies in the Arab Region: Challenges and Opportunities, 2010.
6. Al-Adawi S, Dorvlo AS, Al-Ismaïly SS, Al-Ghafry DA, Al-Noobi BZ, Al-Salmi A, et al. Perception of and attitude towards mental illness in Oman. *Int J Soc Psychiatry* 2002;48(4): 305-17.
7. Dinos S, Stevens S, Serfaty M, Weich S, King M. Stigma: the feelings and experiences of 46 people with mental illness. Qualitative study. *Br J Psychiatry*. 2004; 184: 176-81.
8. Adeyemi JD, Olonade PO, Amira CO. Attitude to psychiatric referral: a study of primary care physicians. *Niger Postgrad Med J*. 2002 Jun; 9(2): 53-8.
9. Hodges B, Inch C, Silver I. Improving the psychiatric knowledge, skills, and attitudes of primary care physicians, 1950–2000: a review. *Am J Psychiatry* 2001; 158: 1579-1586.
10. Hussain I, McLoughlin M. P03-558-Collaboration between general practice and community psychiatric service, evaluation of consultation-liaison model. *European Psychiatry*, 2011: 26, Supplement 1:1728
11. Spiessl H, Cording C. Collaboration of the general practitioner and the psychiatrist with the psychiatric hospital; A literature review. *Fortschr Neurol Psychiatr* 2000; 68: 206-215.

المخلص

الخلفية العلمية: أطباء الرعاية الأولية (PCPs) يمثلون خط العلاج الأول في البحرين حيث أنهم يقدمون الرعاية للمرضى الذين يعانون من ظروف مرضية مختلفة بما في ذلك المشكلات العقلية. حتى الآن لا توجد دراسة في البحرين تدرس سلوك أطباء الرعاية الأولية تجاه المرضى النفسيين. **الأهداف:** تقييم سلوك أطباء الرعاية الأولية (PCPs) تجاه المرضى النفسيين في البحرين ومعالجتهم. **الطريقة:** تم توزيع الاستبانة ليتم الإجابة عليها ذاتياً على جميع أطباء الرعاية الأولية في مراكز الرعاية الأولية بوزارة الصحة. جمعت هذه الدراسة المسحية العرضية التفاصيل السكانية والمتغيرات المهنية واستجابات الأطباء على 25 عبارة تتعلق بالتعامل مع المرضى النفسيين. **النتائج:** كانت هناك استجابات إيجابية عدا استجابات أخرى متعددة من جانب أطباء الرعاية الأولية على معظم أسئلة الاستبانة. على سبيل المثال أجابت طبيبات الرعاية الأولية بشكل أقل من أطباء الرعاية الأولية بخصوص وجود صعوبة في التحدث بعقلانية مع المريض النفسي. على عكس طبيبات الرعاية الأولية يمثل أطباء الرعاية الأولية إلى الاعتقاد بأن المرض النفسي غير موروث. أطباء الرعاية الأولية الذين أكملوا برنامج طبيب العائلة المقيم (FPRP) أقل ميلاً إلى الإقرار بأنهم يفضلون تحويل كل مريض نفسي إلى اختصاصي بالمستشفى وذلك من أقرانهم الذين لم يكملوا نفس البرنامج (FPRP) **الخلاصة:** بالرغم من اكتشاف اتجاه إيجابي عام تجاه المرضى النفسيين حسب تقييم هذه الاستبانة إلا أنه يجب الأخذ في الاعتبار العديد من عناصر الاستبانة التي أظهرت اتجاهاً سلبياً وذلك أثناء التخطيط للمستقبلي لبرامج تدريب أطباء الرعاية الأولية على المعالجة النفسية.

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Burnout and Personality among Egyptian Residents

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الإحتراق النفسي والشخصية بين الأطباء المقيمين المصريين

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Abstract

Objective: To determine the relationship between burnout and personality among residents. **Method:** Cross-sectional study using an anonymous handled survey on Suez Canal University Hospital residents. Maslach Burnout Inventory and The 100 Big-Five Factor Markers Questionnaire (long form) of the International Personality Item Pool (IPIP) were used to measure Burnout and Personality, respectively. **Results:** Among 84 (64.6%) responding residents, significant relationship was found between burnout domains and the five personality dimensions. Both emotional exhaustion and depersonalization had significant negative correlation with each of the five personality dimensions. Personal accomplishment had a significant positive correlation with each of the personality dimensions. **Conclusion:** Burnout is a problem closely related to and highly influenced by the personality characteristics of physicians.

Key terms: Residents, personality, Maslach Burnout Inventory, questionnaire format for the 100 Big-Five Factor Markers

Declaration of interest: None.

Introduction and Rational

During the 1970s and 1980s, medical educators attempted to examine the quality of the personal and professional lives of resident physicians. Several small nonrandomized studies found a higher incidence of depression¹ and anger and hostility² in residents than in the general population. Green and other researchers³ have suggested a link between long work hours and loss of professionalism among residents.

Within the job stress-illness literature, the study of burnout has started since 1964.⁴ Since Freudenberg⁵ used the term burnout, it has mainly been used to describe a state of physical and emotional exhaustion whose characteristics have been mostly applied to human services professionals, within which health staff is included. According to Maslach and colleagues,⁶ burnout is a syndrome defined by the three principal components of emotional exhaustion, depersonalization, and diminished feelings of personal accomplishment.

On the other hand, people do not simply respond to the work setting, rather, they bring unique qualities to the relationship. These personal factors include, among others, enduring personality characteristics.⁶ And, despite human uniqueness, precludes the placement of individuals "on any particular point of a trait or ability continuum,"⁷; personality can be defined as a dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviors in various situations.⁸

An overview of the findings of McManus and colleagues⁹ on physicians is that perceived work climate and its pathologies, such as burnout, are predicted mainly by personality. Moreover, because of the high stability of the measures of Big Five dimensions of personality (Agreeableness, Conscientiousness, Extraversion, Neuroticism and Openness (OCEAN)) across the lifespan^{10,11,12} as well as their heritable component,¹³ McManus and his colleagues⁹ had little doubt that personality at time of application for medical school would also had been predictive, particularly given that a similar pattern of correlations had been found in different cohorts of doctors in mid-career.

According to Yang and Bond,¹⁴ culturally specific dimension and variation on each dimension of personality is evident through cross-cultural research. Such variations may be uniquely important within each culture's particular social context. From all the above, it appeared that complex interactions between burnout and personality dimensions had yet to be described and understood. It followed that further research was needed to look for the role of personality in burnout.

The studied sample in the present study does not have any unique characteristics that differ from any other residency program studied elsewhere, as residents in this study work in settings typical for any other university-based training programs in other countries. However, residents in this sample of Egyptian young physicians are believed to be different as regard their cultural and social

backgrounds. Therefore, a study of the interactions between burnout, depression and personality dimensions among Egyptian physicians is of practical and scientific importance.

Research Questions

In light of the above introduction, the following question was formulated:

1. What is the relationship between the Big-Five personality dimensions and burnout?

Hypotheses

Hypotheses deal with the expected results of a study. Hypotheses are generally based upon a scientific theory, allowing for both prediction and testability.^{15,16} The hypotheses tested in this study are:

(H₀₁) There is no statistically significant relationship between the Big-Five personality dimensions and burnout.

(H_{a1}) There is a statistically significant relationship between the Big-Five personality dimensions and burnout.

Subjects and methods

Type of the study

This is a descriptive cross-sectional study.

Place of study

The study was held in Suez Canal University Hospital in Ismailia.

Sampling and sample size

** Target population: resident physicians in Suez Canal University Hospital.

** Sample type: simple random sample; where sample members were randomly selected from residents.

** Sample size:

The sample size was determined using the following equation:¹⁷

$$S = [Z^{\alpha^2} / \Delta]^2 * P (1-P)$$

Where:

Z^{α²} (confidence level) = 1.96

Δ (width of confidence interval) = 0.05

P (prevalence of burnout among physicians¹⁸) = 33%

S (sample size) = 340

As the population was known and was small, finite population correction was calculated as follows:¹⁹

$$n = S / [1 + (S - 1) / N]$$

Where:

N (finite population size) = 180

n (adjusted sample size) = 118

A drop out of 10% was expected, so the sample size became:

$$118 + (118 * 10 / 100) \approx 130$$

Measurement instruments

To achieve the objectives of this study, a questionnaire was used; formed of three parts:

1. Personal data (age; gender; marital status) and average number of working-hours per week.
2. Maslach Burnout Inventory²⁰ (MBI) (1996).
3. International Personality Item Pool Big-Five²¹ (IPIP-B5) long form (100 items) questionnaire.

Procedure

Each physician was handed a 3-part questionnaire and given a one-week period to complete it. The order of presentation of the IPIP-B5 and MBI was counterbalanced to minimize any potential order effect. After the end of the one-week period, the physician was considered as 'non-respondent' if the questionnaire was not returned.

Scoring and interpretation of results

1- Maslach Burnout Inventory²⁰ (MBI)

The MBI is designed to assess the three aspects of burnout syndrome. Each aspect is measured by a separate subscale.

A participant was considered to meet the study criteria for burnout if he or she got a 'high' score on at least two of the three dimensions of MBI.

2- International Personality Item Pool Big-Five (IPIP-B5)

The 100 Big-Five Factor Markers Questionnaire (long form) of the International Personality Item Pool²¹ (IPIP) was used in this study to measure the Big Five domains of personality). The instrument has a 5-point, Likert-type scale ranging from 1 (very inaccurate) to 5 (very accurate).

The internal consistency reliability estimates²² (coefficient alpha) of the long form for each of the five domains were .91 (Factor I: Extraversion), .88 (Factor II:

Agreeableness), .88 (Factor III: Conscientiousness), .91 (Factor IV: Emotional stability), and .90 (Factor V: Intellect/Imagination). The number of items per pole by factor number (i.e., the number of items keyed in the positive and negative directions for each construct measured by the IPIP instrument) was I+(10), I-(10); II+(14), II-(6); III+ (11), III- (9); IV+ (5), IV- (15); and V+ (13), V- (7).

N.B.: unlike most literature and other Big Five personality scales, Neuroticism in the IPIP-B5 refers to emotional stability, rather than reactivity. So, the higher the score on this dimension, the more emotionally stable the individual is. And vice versa, the lower the score, the more emotionally reactive the individual is.

Pilot study

Inconsistencies of the second intermediate questionnaire were modified on the basis of a pilot study that included 20 physicians. The second intermediate questionnaire was administered to 20 physicians, who had never seen the questionnaire before, for pilot-testing. Each of these 20 physicians after completing the questionnaire

themselves was then interviewed for any difficulty encountered during completion of the questionnaire. Any inconsistencies were taken into account and suggestions were incorporated into the second intermediate questionnaire to form the final questionnaire. The final questionnaire was applied and data was collected during the year 2012.

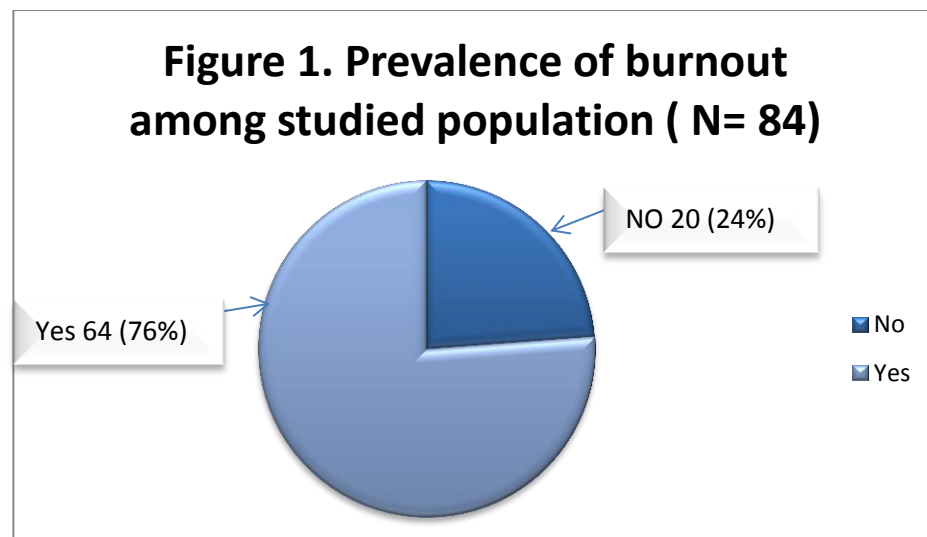
Results

Out of 130 residents, 84 completed the questionnaires (response rate of 64.6%). The respondent group was such that most were males (54.8%), single (76.2%), and the group's average work-hours per week was 84.12 hours (SD 30.46), with a large range (30 - 144) of work-hours per week. Burnout was found not to correlate with work hours, so that burnout affected the physicians no matter what work schedule they had.

Considering each domain of burnout separately, high levels of burnout affected a majority of the studied residents; being most prevalent for emotional exhaustion, followed by depersonalization and finally "lack of" personal accomplishment (Table 1).

Table 1. Distribution of studied population according to burnout level in different domains (N = 84)

Burnout Domains		Burnout level						
		Low		Average		High		Total
		No.	%	No.	%	No.	%	
•	EE	4	4.8	12	14.3	68	81.0	84
•	DP	8	9.5	22	26.2	54	64.3	84
•	PA	14	16.7	26	31.0	44	52.4	84



Of the studied group, 76% scored high levels of burnout on at least 2 of the 3 domains of burnout. (Figure 1)

There are no normative data for the personality dimensions, especially for an Egyptian sample of physicians. To interpret individuals' scores, the mean and standard deviation (SD) for the sample was calculated,

and scores within one-half SD of the mean were interpreted as 'Average'. Scores outside that range were interpreted as 'Low' or 'High'.²¹

Table 2. Distribution of studied population according to personality domains (N = 84)

Personality Domains	Mean \pm SD	Range
• Openness to experience (O)	67.14 \pm 12.29	44 – 96
• Conscientiousness (C)	65.48 \pm 13.72	40 – 93
• Extraversion (E)	58.36 \pm 13.44	26 – 86
• Agreeableness (A)	72.24 \pm 13.55	38 – 98
• Neuroticism (= emotional stability) (N)	49.50 \pm 14.84	22 – 79

N.B. In the results of the present study, 'higher' scores on Neuroticism means the physician was more emotionally stable and relaxed, while 'lower' scores indicate more hostility and anger.

Had the scores been normally distributed this would have resulted in approximately 68% of the sample being

classified as 'Average', about 16% as 'Low', and 16% as 'High'.²¹

Table 3. Distribution of studied population according to personality level in different domains (N = 84)

Personality Domains	Personality level						
	Low		Average		High		Total
	No.	%	No.	%	No.	%	
• O	28	33.3	30	35.7	26	31.0	84
• C	28	33.3	30	35.7	26	31.0	84
• E	24	28.6	38	45.2	22	26.2	84
• A	28	33.3	34	40.5	22	26.2	84
• N	30	35.7	26	31.0	28	33.3	84

It is shown in Table 3 that the residents' scores were not normally distributed, with an average of only one-third of physicians being classified as 'Average' for each dimension. Interestingly, both the 'Low' and 'High' ranges were increased almost equally. Residents probably have a specific personality profile that is different from the expected normal distribution. Or it may be that medicine attracts individuals of specific personality build up.

Relation between burnout and personality

Burned-out residents were significantly different from the normal group regarding personality (Table 4). On every personality dimensions, the majority of the burned-out residents were 'Low' or 'Average'. Conversely, the majority of the normal group was 'Average' or 'High'. All (100%) of the residents scoring 'Low' on Openness to experience and Extraversion were burned-out.

Table 4. Relation between burnout and personality domains among studied population (N =84)

Personality Domains		Burnout				Total	p-value
		Yes (n = 64)		No (n = 20)			
		No.	%	No.	%		
O	Low	28	100.0	0	0	28	<0.001*
	Average	18	60.0	12	40.0	30	
	High	18	69.2	8	30.8	26	
C	Low	24	85.7	4	14.3	28	0.009 *
	Average	26	86.7	4	13.3	30	
	High	14	53.8	12	46.2	26	
E	Low	24	100.0	0	0	24	<0.001*
	Average	28	73.7	10	26.3	38	
	High	12	54.5	10	45.5	22	
A	Low	26	92.9	2	7.1	28	0.026 *
	Average	22	64.7	12	35.3	34	
	High	16	72.7	6	27.3	22	
N	Low	28	93.3	2	6.7	30	0.014 *
	Average	18	69.2	8	30.8	26	
	High	18	64.3	10	35.7	28	
* Statistically significant at p < 0.05							
Fisher's exact test							

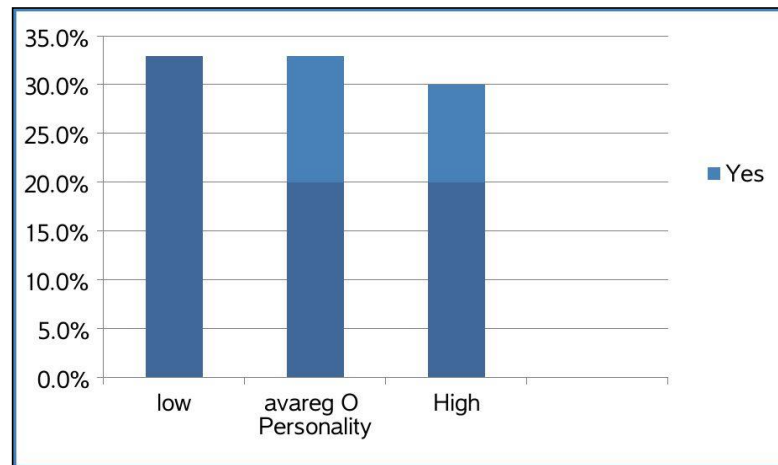


Figure 2 - A. Distribution of burnout according to Openness level among studied population (N = 84)

Residents with 'Low' Openness to experience were all (100%) burned-out (Figure 2 - A). It was found that the

prevalence of burnout was higher among residents scoring 'High' on this dimension than those scoring 'Average' (69.2% and 60% respectively) (Table 4).

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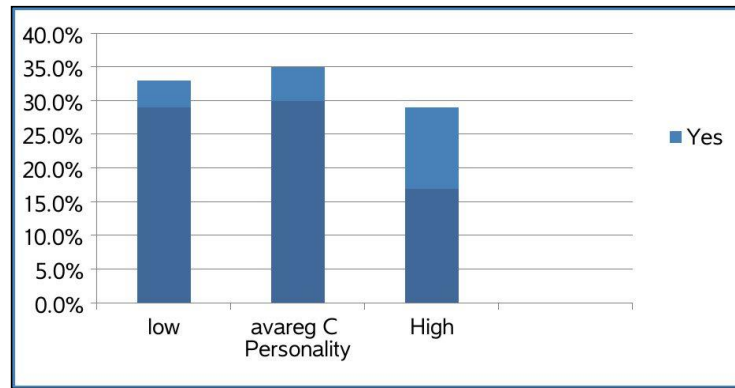


Figure 2 - B. Distribution of burnout according to Conscientiousness level among studied population (N = 84)

Only 'High' levels on the Conscientiousness dimension were associated with a considerable decrease in the prevalence (53.8%) of burnout (Figure 2 - B). 'Average'

and 'Low' groups were almost equally affected (86.7% and 85.7% respectively) (Table 4).

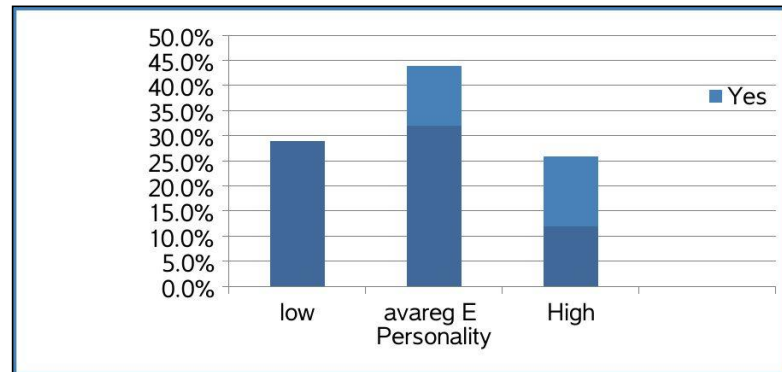


Figure 2 - C. Distribution of burnout according to Extraversion level among studied population (N = 84)

While residents scoring 'Low' on Extraversion dimension (classically called introverts) were all (100%) burned-out (Figure 2 - C), only 54.5% of the residents who scored 'High' on Extraversion had burnout (Table 4).

Being 'Average' on the Agreeableness dimension was associated with the least prevalence of burnout (64.7%) (Figure 2 - D), while 'Low' levels on the same dimension were associated with the highest prevalence of burnout (92.9%) (Table 4).

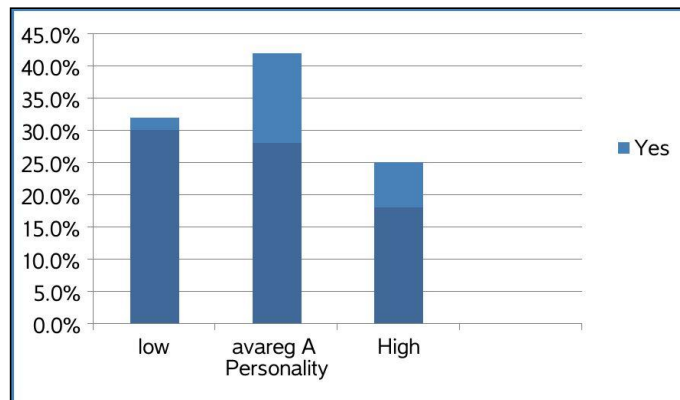


Figure 2 - D. Distribution of burnout according to Agreeableness level among studied population (N = 84)

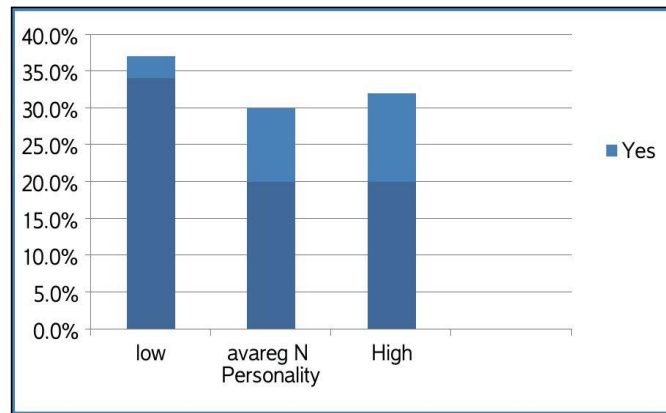


Figure 2 - E. Distribution of burnout according to Neuroticism (emotional stability) level among studied population (N = 84)

More than 93% of the residents 'Low' on the Neuroticism (emotional stability) dimension (Table 4) were burned-out (Figure 2 - E), being more anxious, more angry, more hostile (more emotionally reactive). 'Average' and 'High' groups, being more emotionally stable, were less frequently burned-out.

According to Tabachnick and Fidell,²³ correlation coefficients greater than 0.30 are considered meaningful. Both emotional exhaustion and depersonalization had highly significant negative correlation with each of the five personality dimensions. Not only were the correlations statistically significant, but also meaningful²³ as well ($r > 0.30$ in every correlation). So,

the lower the resident on any of the personality dimensions the higher emotional exhaustion and depersonalization they experienced.

On the other hand, a sense of personal accomplishment had a highly significant positive correlation with each of the personality dimensions (except for neuroticism, which was only significant). As well, personal accomplishment correlations with personality dimensions were considered meaningful ($r > 0.30$), even for Neuroticism ($r = 0.276$, close to 0.30) and thus may be considered meaningful. So, the lower the resident on any of the personality dimensions, the lower the sense of personal accomplishment they experienced.

Table 5. Correlation between burnout dimensions and personality domains among studied population (N = 84)
Burnout Dimensions

Personality Domains	EE	DP	PA
O	- 0.356 (0.001*)	- 0.442 (<0.001*)	0.414 (<0.001*)
C	- 0.408 (<0.001*)	- 0.427 (<0.001*)	0.427 (<0.001*)
E	- 0.390 (<0.001*)	- 0.407 (<0.001*)	0.550 (<0.001*)
A	- 0.389 (<0.001*)	- 0.530 (<0.001*)	0.722 (<0.001*)
N	- 0.415 (<0.001*)	- 0.546 (<0.001*)	0.276(<0.011*)
Correlation coefficient r (p-value)			
* Statistically significant at $p < 0.05$			

Discussion

Residents' response rate (64.6%) seemed rather low. However, regarding the high rates of burnout among participants- as shown below- such a rate could be acceptable. Especially so when the response rate in other burnout studies among physicians was as low as 26.7% 43.⁶² The responding residents in the current study belonged to different specialties.

The mean work hours per week among the residents was over 80 hours per week (range from 30 to 144). Regulatory attempts at limiting medical resident work hours to an 80-hour limit are running in other countries like the US.⁶³ In Europe,⁶⁴ a 9-year transition period was agreed upon by the European Parliament to limit working hours to a maximum of 58 hours effective from August 2004 to be reduced further to a maximum of 48 hours per week ultimately. The debate related to the

regulation of work hours tends to focus more on costs rather than safety of physicians or patients.

In the present study, the fact that the risk of burnout may differ across individuals is acknowledged. The present study examined the relationship between burnout and personality systematically by using the Big Five as an integral model of personality. While small sample size does not allow for strong conclusions, a few findings are particularly noteworthy.

First, despite the small sample, significant and meaningful relationships for each of the three burnout dimension scores were found. Every single personality dimension was significantly associated with burnout. Not only that, but also every personality dimension was significantly correlated with each of the burnout domains as well.

It therefore seems plausible that benefits to the organization of an emphasis on personality traits may be greater for the recruitment, selection, hiring, and placement practices than training and development activities since personality traits of adults are relatively fixed.²⁴

Of the study sample, 76% suffered from burnout; with considerably high mean scores for emotional exhaustion and depersonalization and low scores of personal accomplishment. If the non-respondents in this study were taken into consideration (46 physicians), the prevalence may have ranged from 49.2% (if all were not burned out) to 84.6 % (if all were). Shanafelt et al.²⁵ found that burnout was very common among residents in all years of residency training. More than 75% of respondents in the study met the criteria for burnout. Martini et al.⁶⁵ also found that residents in their first year had significantly high rates of burnout (77.3%).

In a study on Saudi physicians, 29.5% of respondents reported high emotional exhaustion, 15.7% high depersonalization and 19.7% low personal accomplishment. Egyptian residents had more severe results on both emotional exhaustion and depersonalization.⁶⁶ In Kuwait,⁶⁷ 63.2% had high emotional exhaustion, 65.3% high depersonalization and 61.1% low personal accomplishment. Again, Egyptian physicians suffered more emotional exhaustion and depersonalization and less lack of personal accomplishment. This might suggest that the pattern of burnout in Egypt differs from that in the Gulf region.

The prevalence of burnout among residents (76% in the current study) proves to be considerably high in comparison to other professions. The rates of burnout among teachers in European countries range between 25% and 35%.²⁶ About 55% of the traffic police agents

were affected by burnout syndrome; still less prevalent than resident physicians.²⁷ The prevalence of burnout syndrome was 31.8% among academic staff.²⁸ Burnout was evident among 51.5% of public health nurses.²⁹ Athletic trainers showed a burnout prevalence of 17.2%.³⁰ Being a resident puts a lot of burden on physicians' shoulders.

When considering the relation between the Big Five personality dimensions and burnout domains, data analyses determined several significant relationships between personality dimensions and the burnout domains that were repeatedly determined by previous analyses.

Various studies have demonstrated a statistically significant relationship between personality and burnout.^{34,39} Neuroticism and Extraversion tend to be consistently related to all three of the burnout domains.^{37,40,42} Although there is less consensus about Openness to experience, Agreeableness and Conscientiousness, each of the three dimensions also appears to be related to the burnout domains.^{37,40,42,43} The findings of the current study are no exception to the aforementioned findings.

In the present study, Openness to experience demonstrated a statistically significant positive as well as meaningful relationship with personal accomplishment ($r = 0.414$; $p < 0.001$), and a statistically significant, as well as meaningful, negative relationship with emotional exhaustion ($r = -0.356$; $p < 0.001$) and depersonalization ($r = -0.442$; $p < 0.001$). From previous studies it appears that this dimension is positively related to personal accomplishment.^{35,37,39} Thus, the results of this study are consistent with previous research.

Openness to experience is characterized by intellectual curiosity and willingness to experiment. In addition, individuals measuring high on Openness to experience tend to make use of more adaptive and flexible coping strategies.^{37,44,48} Residents who score high on Openness to experience, tend to experience problems at work as challenges they try to overcome rather than as a hindrance to their work.⁴² These individuals may also be more likely to attempt creative solutions to solving their difficulties at work.

An individual who experiences a high level of personal accomplishment may also experience more confidence in attempting to master new situations thereby reducing experiences of burnout from occurring.

Conscientiousness demonstrated a statistically significant, as well as meaningful, negative relationship with emotional exhaustion ($r = -0.408$; $p < 0.001$) and depersonalization ($r = -0.427$; $p < 0.001$). A statistically significant and meaningful positive relationship was

found between Conscientiousness and the sense of personal accomplishment ($r = 0.427$; $p < 0.001$). Research has demonstrated that Conscientiousness is positively related to personal accomplishment.^{37,41,43} In addition, both Kokkinos⁴³ and Morgan³⁷ found that a negative relationship exists between Conscientiousness and depersonalization.

Conscientiousness is linked to achieving high levels of success through purposeful planning and persistence. These individuals also have the ability to persist at difficult or unpleasant tasks until they are completed.^{37,44,46,49} These individuals may tend to work consistently thereby avoiding large amounts of work at the last moment.^{42,49} This in turn may result in increased experiences of personal accomplishment and reduced feelings of depersonalization and emotional exhaustion. Residents scoring lower on Conscientiousness may tend to be compulsive, lazy and impulsive, failing to ensure consistent completion of work, which is a requirement of professional health care practice.⁵⁰ Accomplishments of impulsive residents, are therefore small, scattered and inconsistent.

The correlations indicated a statistically significant, as well as meaningful, relationship between Extraversion and the three burnout domains, namely, emotional exhaustion ($r = -0.390$; $p < 0.001$), depersonalization ($r = -0.407$; $p < 0.001$) and personal accomplishment ($r = 0.550$; $p < 0.001$). These findings are similar to the results of previous studies.^{40,42} Tomic et al.,⁵¹ Kokkinos,⁴³ and Morgan³⁷ demonstrated that Extraversion is negatively related to emotional exhaustion and depersonalization, and positively related to personal accomplishment.

Individuals scoring high on Extraversion tend to enjoy being with people, are full of energy and often experience positive emotions. They tend to be enthusiastic and action-oriented individuals. Furthermore, high scores on Extraversion are related to problem-focused coping and rational action.^{42,44,45,49,52} It may be possible that residents scoring higher on Extraversion tend to engage in social activities more often than residents scoring lower on Extraversion. The subsequent social support may act as a resource and buffer the deleterious effects of stress.^{49,53}

Conversely, individuals scoring lower on Extraversion may tend to remain isolated from their peers, seldom discussing their stressors or seeking social contact with their peers.⁵⁴ This in turn may result in augmented experiences of exhaustion and depersonalization toward the work and the patients.

Agreeableness demonstrated a statistically significant - and meaningful - negative relationship with both depersonalization ($r = -0.530$; $p < 0.001$) and emotional exhaustion ($r = -0.389$; $p < 0.001$), while a statistically significant - also meaningful - positive relationship with personal accomplishment ($r = 0.722$; $p < 0.001$). These findings are supported by Deary et al.³⁵ who found that Agreeableness was negatively related to depersonalization and Bakker et al.⁴⁰ who found that Agreeableness was positively related to personal accomplishment.

Agreeable physicians highly value getting along with others. They are therefore considerate, friendly, generous, helpful and willing to compromise their interests for others. They believe people are basically honest, decent and trustworthy.^{42,55,57} Therefore, this finding was not surprising in that, high levels of Agreeableness as a personality trait are primarily associated with being more sympathetic towards others.⁵⁸ Physicians low in this area place self-interest above getting along with others. They are generally unconcerned with others' well-being and therefore are unlikely to extend themselves for other people.^{42,49,57} Thus, sometimes their skepticism about others' motives causes them to be suspicious, unfriendly and uncooperative.⁴⁹

Neuroticism (emotional stability) demonstrated a statistically significant, and meaningful, negative relationship with emotional exhaustion ($r = -0.415$; $p < 0.001$) and depersonalization ($r = -0.546$; $p < 0.001$), and a statistically significant, and more or less meaningful, positive relationship with personal accomplishment ($r = 0.276$; $p < 0.011$). These results are in line with previous research, which have generally found that Neuroticism (emotional stability) is related to all three of the burnout domains.^{34,40,43} Buhler and Land³⁴ found that high emotional stability demonstrated a negative relationship with emotional exhaustion and depersonalization. Similar findings were obtained by Kokkinos⁴³ and Bakker et al.⁴⁰ Miner³⁶ and Kokkinos⁴³ also found a positive relationship between high emotional stability and personal accomplishment.

Research has shown that decreased emotional stability is related to interpreting ordinary situations as threatening and minor frustrations as hopelessly difficult.^{49,59} In addition, individuals with more emotional reactivity tend to experience a sense of apprehension and underestimate their own abilities.^{40,42} Accordingly, McCrae and Costa⁵⁸ hypothesized that the emotionally reactive individuals were more likely to become burned out in their work.

Physicians with more emotional stability tend to be calm, relaxed and rarely experience negative feelings,⁵⁷ enabling them to cope better with the demands of hospital life and allowing the use of more effective coping strategies in dealing with stress.^{35,60} This in turn serves as a resource, prompting personal growth and feelings of accomplishment at work.⁵⁸

Conclusion

Various personal, interpersonal, and organizational factors have been reported to relate to burnout in the medical environment. Barely sufficient income, the imbalance between the effort and reward, together with the perception of the administration as being 'poor' are leading burnout-inducers among the residents. A sense of helplessness toward patients and the mismatch of expectations between the patient, his or her relatives, and the physician are significant interpersonal factors. Therefore, burnout is prevalent among residents. It seems that individuals with certain personality make-up attend medical school. Although all are exposed to the same work environment, not all of them become burned-out. This would suggest that physicians are not merely victims of work environment stressors, but rather that they react to them; everyone according to a unique personality profile. Significant relations between burnout and each of the personality dimensions were repeatedly evident.

Recommendations

Some efforts to reduce burnout among residents are critically needed:

- Proper assessment of personality before the newly graduated physician begins the residency program can provide a scientific prediction of the chances of burnout. Providing the proper counseling at an early stage can help avoid the problem.
- Simple measures for improving the working conditions of the residents (e.g., better work schedules, better research opportunities) are required.
- A once-per-year screening for burnout and counseling of physicians with burnout is imperative. An electronic version of a scale with direct results can be time saving and practical.
- A workshop for residents at the beginning of residency training considering relaxation, time management, assertiveness training, training in interpersonal and social skills, teambuilding,

guiding them on how to deal with different personalities and situations.

Limitations

All studies are subject to limitations. Due to the limitations, caution should be used in generalizing the results of the study in the general population.

A major limitation of the study was the small sample size. The anonymous nature of the questionnaires is a potential source of selection bias that is difficult to assess. For example, residents with higher levels of burnout may have been less inclined to take on the additional task of completing the questionnaires. Also, despite the promise of anonymity, residents may have been anxious about providing answers critical of the training programs.

A limitation inherent in correlational research designs that utilize surveys for data collection is the respondents' self-reported information on the survey.⁶¹ Consequently, respondents may report what they think rather than what they do.⁶¹ In turn, the participants' responses may be a truthful representation of their thoughts and attitudes, but may not be an accurate representation of their actions and circumstances.

The authors used the cut-off points of Maslach et al.²⁰ and International Personality Item Pool,²¹ which need not be the same for Egyptians, as both tools have not been standardized on Egyptian population. There was no separate control group, but the use of physicians who were not burned out as the comparison group meant that both groups experienced similar conditions giving a high degree of matching.

Future implications

Applying similar research nation-wide to involve more resident physicians, and using a longitudinal study design, should create a huge data base. Such data can be used to correlate personality, specialty and the chances for burnout. A personality assessment during the house officer year may simply predict which specialties are least or most associated with burnout for each physician. Thus, a physician may get an idea of what is awaiting for him/her as a consultative tool. Such assessment can be used by certain emotionally loaded training program for prior selection of trainees.

References

1. Valko R and Clayton P. Depression in internship. *Dis Nerv Syst* 1975;36: 26-29.
2. Uliana R, Hubbell F, Wyle F, et al. Mood changes during the internship. *J Med Educ* 1984;59: 118-123.

3. Green M. What (if anything) is wrong with residency overwork? *Ann Intern Med* 1995;123: 512-517.
4. Snibbe J, Radcliffe T, Weisberger C, et al. Burnout among primary care physicians and mental health professionals in a managed health care setting. *Psychological Reports* 1989;65: 775-780.
5. Freudenberger H. Staff burn-out. *Journal of Social Issues* 1974;30: 159-165.
6. Maslach C, Schaufeli W, Leiter M. Job burnout. In: Fiske S, Schacter D, and Zahn-Waxler C. (eds.) *Annual Review of Psychology* 2001; 52: 397-422.
7. Allport G. *The Person in Psychology*. Boston: Beacon Press; 1968. p. 164.
8. Ryckman R. *Theories of Personality*. Belmont, CA: Thomson/Wadsworth; 2004.
9. McManus I, Smithers E, Partridge P, et al. A levels and intelligence as predictors of medical careers in UK doctors: 20 year prospective study. *Brit Med J* 2003; 327: 139-142.
10. Matthews G, Deary I, Whiteman M. *Personality traits* (2nd ed.) Cambridge: Cambridge University Press; 2003.
11. McCrae R and Costa P. *Personality in adulthood: A five-factor theory perspective* (2nd ed.). New York: Guilford Press; 2003.
12. Roberts B, Del Vecchio W. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychol Bull* 2000;126: 3-25.
13. Loehlin J. *Genes and environment in personality development*. Newbury Park, CA: Sage; 1992.
14. Yang K, Bond M. Exploring implicit personality theories with indigenous or imported constructs: The Chinese case. *Journal of Personality and Social Psychology* 1990; 58: 1087-1095.
15. Dyer C. *Beginning research in psychiatry: A practical guide to research methods and statistics*. Cambridge, MA: Blackwell Publishers; 1995.
16. Goodwin C. *Research in psychology: Methods and design* (5th ed.). Hoboken, NJ: John Wiley; 2008.
17. Dobson A. Calculating sample size. *Transactions of the Manzi Foundation* 1984;7: 75-79.
18. Garelick A, Gross S, Richardson I, et al. Which doctors and with what problems contact a specialist service for doctors? A cross sectional investigation. *BMC Med* 2007;5: 26.
19. Isreal G. *Sampling the Evidence of Extension Program Impact*. Program Evaluation and Organizational Development, IFAS, University of Florida. 1992. p. 47-61.
20. Maslach C, Jackson S, Leiter M. *Maslach Burnout inventory manual* (3rd ed.) Palo Alto, CA: Consulting Psychologists Press; 1996. p. 24-31.
21. Goldberg L. A broad-band, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In: Mervielde I, Deary I, De Fruyt F and Ostendorf F. (eds.) *Personality psychology in Europe* (Vol. 7). Tilburg, the Netherlands: Tilburg University Press; 1999. p. 7-28.
22. Goldberg L. International Personality Item Pool: A scientific collaboratory for the development of advanced measures of personality traits and other individual differences. Retrieved November 2, 2005, from the International Personality Item Pool Web site: <http://ipip.ori.org>.
23. Tabachnick B, Fidell S. *Using multivariate analysis* (4th ed.). New York: Harper Collins; 2001.
24. Costa P, McCrae R. Personality in adulthood: a six-year longitudinal study of self-reports and spouse ratings on the NEO Personality Inventory. *J Pers Soc Psychol* 1988; 54: 853-863.
25. Shanafelt T, Bradley K, Joyce E, et al. Burnout and Self-Reported Patient Care in an Internal Medicine Residency Program. *Annals of Internal Medicine* 2002;136(5): 358-367.
26. Quattrin R, Ciano R, Saveri E, et al. Burnout in teachers: an Italian survey. *Ann Ig* 2010;22(4): 311-318.
27. Aranda B, Pando M, Salazar E, et al. Social support, burnout syndrome and occupational exhaustion among Mexican traffic police agents. *Span J Psychol* 2009; 12(2): 585-592.
28. Lema I. Prevalence of burnout syndrome and its health effects among academic staff at Muhimbili university of health and allied sciences, Dar es salaam Tanzania. Master of Science in Clinical Psychology. Muhimbili University of Health and Allied Sciences, Dar es salaam Tanzania; 2013.
29. Imai H, Nakao H, Nakagi Y, et al. Prevalence of burnout among public health nurses in charge of mental health services and emergency care systems in Japan. *Environ Health Prev Med* 2006;11(6): 286-291.
30. Giacobbi P. Low Burnout and High Engagement Levels in Athletic Trainers: Results of a Nationwide Random Sample. *J Athl Train* 2009;44(4): 370-377.
31. Barnett R, Gareis K, Brennan R. Fit as a mediator of the relationship between work hours and burnout. *Journal of Occupational Health Psychology* 1999;19: 385-391.
32. Colford J Jr, McPhee S. The raveled sleeve of care. Managing the stresses of residency training. *JAMA* 1989;261: 889-893.
33. Hafferty F, Franks R. The hidden curriculum, ethics teaching, and the structure of medical education. *Acad Med* 1994;69: 861-871.
34. Buhler K, Land T. Burnout and personality in intensive care: An empirical study. *Hospital Topics* 2003;81: 5-12.
35. Deary I, Blenkin H, Agius R, et al. Models of job-related stress and personal achievement among consultant doctors. *British Journal of Psychology* 1996;87: 3-20.
36. Miner M. Burnout in the first year of ministry: Personality and belief style as important predictors. *Mental Health, Religion and Culture* 2007;10: 17-29.
37. Morgan B. The relationship between the big five personality traits and burnout in South African

- University students. Magisterial Atrium. University of Johannesburg; 2008.
38. Schaufeli W, Enzmann D. *The Burnout Companion to Study and Research: A Critical Analysis*. London: Taylor and Francis; 1998.
39. Storm K, Rothmann S. The relationship between burnout, personality traits and coping strategies in a corporate pharmaceutical group. *South African Journal of Industrial Psychology* 2003;29: 35-42.
40. Bakker A, van der Zee K, Lewig K, et al. The relationship between the Big Five personality factors and burnout: A study among volunteer counsellors. *The Journal of Social Psychology* 2006;146: 31-50.
41. Piedmont R. A longitudinal analysis of burnout in the health care setting: the role of personal dispositions. *Journal of Personality Assessment* 1993;61: 457-473.
42. Zellars K, Perrewe P, Hochwarter W. Burnout in health care: The role of the five factors of personality. *Journal of Applied Social Psychology* 2000;30(8): 1570-1598.
43. Kokkinos C. Job stressors, personality and burnout in primary school teachers. *British Journal of Educational Psychology* 2007;77: 229-243.
44. Bouchard G, Guillemette A, Landry-Leger N. Situational and dispositional coping: An examination of their relation to personality, cognitive appraisals, and psychological distress. *European Journal of Personality* 2004;18: 221-238.
45. DeLongis A, Holtzman S. Coping in context: The role of stress, social support, and personality in coping. *Journal of Personality* 2005;73: 1633-1656.
46. Lee-Baggle D, Preece M, DeLongis A. Coping with interpersonal stress: Role of Big Five traits. *Journal of Personality* 2005;73: 1141-1180.
47. McCrae R. Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology* 1987;52: 1258-1265.
48. McCrae R, Costa P Jr. Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality* 1986;54: 385-405.
49. McCrae R, Costa P. *Personality in adulthood: A five-factor theory perspective* (2nd ed.). New York: Guilford Press; 2006.
50. Richard V, Kenneth J, Ramaprabha P, et al. Impact of introduction of sharps containers and of education programs on the pattern of needle stick injuries in a tertiary care centre in India. *J Hosp Infect* 2001; 47(2): 163-165.
51. Tomic W, Tomic D, Evers W. A question of burnout among reformed church ministers in Netherlands. *Mental Health, Religion and Culture* 2004;7: 225-247.
52. Watson D, Clack L. Extroversion and its positive emotional core. In: Hogan R, Johnson J and Briggs S (eds.) *Handbook of personality psychology*. San Diego, CA: Academic Press; 1997. p. 767-793.
53. Demerouti E, Bakker A, Nachreiner F, et al. The job demands-resources model of burnout. *Journal of Applied Psychology* 2001;86(3): 499-512.
54. Friedlander L, Reid G, Shupak N, et al. Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates. *Journal of College Student Development* 2007;48: 259-275.
55. Digman J. Personality structure: Emergence of the Five-Factor model. *Annual Review Psychology* 1990;41: 417-440.
56. McCrae R, Costa P. Reinterpreting the Myers-Briggs Type Indicator from the perspective of the five-factor model of personality. *Journal of Personality* 1989;57: 17-40.
57. McCrae R, John O. An introduction to the five-factor model and its applications. *Journal of Personality* 1992; 61:175-215.
58. McCrae R, Costa P. *NEO Inventories for the NEO Personality Inventory-3 (NEO-PI-3) NEO Five-Factor Inventory-3 (NEO-FFI-3) NEO Personality Inventory-Revised (NEO PI-R) Professional Manual*. Lutz, FL: PAR; 2010.
59. Watson D, Clark L. On traits and temperament: General and specific factors of emotional experience and their relation to the Five-Factor model. *Journal of Personality* 1992;60: 441-476.
60. Bolger N, Zuckerman A. A framework for studying personality in stress process. *Journal of Personality and Social Psychology* 1995;117: 187-215.
61. Creswell J. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill and Prentice Hall; 2002.
62. Shanafelt T, Boone S, Tan L, et al. Burnout and Satisfaction With Work-Life Balance Among US Physicians Relative to the General US Population. *Arch Intern Med* 2012;172(18):1377-1385. doi:10.1001/archinternmed.2012.3199.
63. Wilkey R. "Federal Whistleblower Protection: A means of Enforcing Maximum-Hour Legislation for Medical Residents". *William Mitchell Law Review* 2003;30(1). Retrieved 2012.
64. Steinbrook R. The debate over residents' work hours. *N Engl J Med* 2002;347: 1296-1302.
65. Martini S, Broken C, Churchill A, et al. Burnout among residents in different medical specialties. *Academic Psychiatry* 2004; 240-242.
66. Al-Sareai N, Al-Khaldi Y, Mostafa O, et al. Magnitude and risk factors for burnout among primary health care physicians in Asir province, Saudi Arabia. *East Mediterranean Health Journal* 2013;19 (5): 426-434.
67. Shoraiana G, Hussain N, Alajmi M, et al. Burnout among family and general practitioners. *Alexandria Journal of Medicine* 2011;47,359-364.

المخلص

مقدمة: متلازمة "الاحترق النفسي" - والتي تتكون من ثلاثة أعراض رئيسية وهي: الانهك العاطفي، نقص الشعور بالكفاءة المهنية، وإلغاء شخصية المريض - والتي تتعلق بالارهاق الجسدي والنفسي الذي يتعرض له الطبيب في محاولة للتأقلم مع مصاعب عمله اليومية. ولكن طبيعة الدور الذي تلعبه أبعاد الشخصية كعامل مؤثر على الاحتراق النفسي بين الأطباء المصريين ينقصها المزيد من البحث والدراسة. **الأهداف:** تهدف الدراسة إلى تحديد العلاقة بين الأبعاد الخمسة الكبرى للشخصية (الانفتاح على التجربة - الضميرية - الانبساط - التوافقية - العصابية) والاحتراق النفسي. **الطريقة:** لقد تم تطبيق هذه الدراسة على عينة تتكون من 84 طبيب يعملون في المستشفى الجامعي بالإسماعيلية وفي وحدات الرعاية الصحية الأولية التابعة لكلية الطب بنسبة استجابة 64.6%. وتم استخدام استمارة استبيان تتكون من ثلاثة أجزاء: البيانات الشخصية للطبيب، استبيان "ماسلاش" للاحتراق النفسي، استبيان أبعاد الشخصية - 100 (المطولة). **النتائج:** أظهرت الدراسة أن معدل انتشار الاحتراق النفسي بين الأطباء المقيمين يصل إلى 76%. من خلال الدراسة وجد أن كل من الأبعاد الخمسة الكبرى للشخصية يرتبط بعلاقة ذات دلالة إحصائية مع كل من العوامل الثلاث المكونة لمتلازمة الاحتراق النفسي. ارتبط كل من الانهك العاطفي وإلغاء الشخصية ارتباطاً عكسياً ذا دلالة إحصائية مع أبعاد الشخصية؛ في حين كانت العلاقة طردية مع الشعور بالكفاءة المهنية. فكلما زادت درجات الطبيب على أي من أبعاد الشخصية: قل انهكاه العاطفي والغائه لإنسانية مرضاه وازداد إحساسه بالكفاءة والانجاز. **ختاماً:** مما سبق يتضح ما للشخصية من عميق علاقة بالاحتراق النفسي، وهو ما يشير إلى الدور الذي تلعبه أبعاد الشخصية في تفاعل الطبيب مع مرضاه وبيئة العمل ككل.

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Enzymatic Studies in Autism Spectrum Disorder from a Psychiatric Research Unit in Mosul, Iraq

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دراسات إنزيمية لاضطراب طيف التوحد لوحدة البحوث النفسية في الموصل - العراق

صفاء عبدالعزيز الأمين، إلهام خطاب الجماس، فدوى خالد توفيق، طارق يونس أحمد

Abstract

B **ackground:** Autism spectrum disorder (ASD) is characterized by impairment in social communication and repetitive or restricted patterns of interest appearing during the first three years of life. It is four times more common in boys than girls with an overall incidence 5/10000. Despite extensive research, the etiology and natural history of ASD remains poorly understood. Oxidative stress and environmental toxicants exposure might contribute in ASD pathophysiology. **Objectives:** (1) Studying the oxidative stress effect of ASD patients; (2) assessment of the dipeptidyl peptidase-4 (DPP-4) activity of ASD patients and its critical role in gastrointestinal disorder and inflammation; and, (3) studying the relationship between DPP-4 activity and related oxidative stress enzymes. **Method:** Thirty seven children diagnosed with ASD (31 boys and 6 girls; age range 2-12 years) were selected randomly from the Psychiatric Research Unit-Mosul University. Diagnosis by specialist psychiatrists followed the DSM-IV criteria with the group classified into mild, moderate and severe categories of symptom severity. A control group consisted of 30 healthy children (20 boys and 10 girls). Glutathione-S-Transferase(GST), Acetyl cholinesterase(AchE), Myeloperoxidase (MPO), Xanthine Oxidase (XO) and aryl esterase activities were assayed. Statistical tests were used to calculate the differences in enzymatic activities; to study the DPP-4 effect on various inflammations; and, to clarify the correlation between DPP-4 with the studied enzymes. **Results:** There was a significant ($p \leq 0.05$) decrease in DPP-4 activity of mild, moderate and severe ASD group (-15.2%, -37.2%, -48%) respectively compared to the control group. Activities of MPO, Ach E, Aryl esterase and GST were significantly ($p \leq 0.05$) decreased in severe ASD group. XO activity was significantly ($p > 0.05$) increased in severe ASD group. The present study indicated a significant ($p > 0.05$) relationship between DPP-4 activity and gastrointestinal disorder. The incidence of GI disorder was (69.7%). A significant ($p > 0.05$) relationship between DPP-4 and inflammation with Incidence (87.9%) was observed. There was a positive significant correlation ($p > 0.05$) between DPP-4 activity and activities of MPO, Ach E, Aryl esterase and GST while a negative significant correlation with XO activity was shown. **Conclusion:** Oxidative stress is a potential risk factor in ASD with effects on several enzymatic activities. DPP-4 might be a good marker in some individuals with ASD especially in those having gastrointestinal disorder and various inflammations. The correlation results suggest that the relationships between DPP-4 activity and studied related enzymes.

Keyword: Autism spectrum disorder, Dipeptidyl peptidase-4, Gastrointestinal disorder, Inflammation, Enzymes.

Declaration of interest: None

Introduction

Autism spectrum disorder (ASD) is characterized by impairments in social communications and repetitive or restricted patterns of interests or behaviors appearing during the first three years of life.¹ Despite extensive research, the etiology and natural history of ASD remains poorly understood.² Recent research indicates that several prenatal and perinatal factors are associated with ASD³. Other studies suggest that ASD might result from interaction between genetic, environmental and immunological factors with oxidative stress as a mechanism linking these risk factors.⁴ Growing evidence suggests that redox imbalance and oxidative stress might contribute to ASD pathophysiology.⁵ Physiological

oxidative stress is caused by an imbalance between the production of reactive oxygen species (ROS) and the ability to detoxify the reactive intermediates or repair the resulting damage.⁶ This might suggest that Oxidative stress can increase via environmental toxicants exposure. Toxicants such as heavy metals pesticides and chemicals can damage cells and impair cellular signaling.⁷ A prominent feature of children with autism is gastrointestinal (GI) disorders, which seems to occur in approximately one third of patients. GI symptoms include chronic constipation, diarrhea and abdominal pain.⁸ Several studies indicate that enzymatic activities of some enzymes might change in ASD patients.^{9,10} One of these enzymes is Dipeptidyl peptidase-IV (DPP-4),

which is a protein with multiple functions. It is known under different names depending on where it is found. DPP-4 is easily deactivated by small amounts of toxins, including mercury and organophosphates. Its function is needed to digest some peptides from gluten, casein and other substances that can have an opioid-like effect.¹¹ Insufficient production of the DPP-4 enzyme on the inner surface of the small intestine results in opioid effects of casomorphin and gluteomorphin structures, especially in people with autism.¹² Glutathione-S-transferase (GST), an enzyme which conjugates glutathione (GSH) to toxic electrophile, is reduced or absent in individuals with autism.^{9,13} Aryl esterase activity detoxifies organophosphate pesticides and its activity is reduced in children with ASD when compared with healthy controls¹⁴ although some studies have identified similar activity in both groups.¹⁵ Organophosphates also function to irreversibly inhibit the activity of acetyl cholinesterase (AChE).¹⁶ AChE, a marker of the central cholinergic system, is responsible for hydrolysis of acetylcholine.¹⁷ Acetylcholine regulates aspects of nerve excitation. It plays a critical role in regulating muscle contraction, learning, attention, cognition and memory throughout adulthood.¹⁶ Since children with ASD frequently have accompanying gastrointestinal symptoms,¹⁸ including inflammation of the GI tract and fungal infection, myeloperoxidase (MPO) was assessed. MPO belongs to oxidoreductase enzymes family¹⁹ and is secreted from active neutrophils.²⁰ Studies have shown that children with autism who have severe GI also have low serum levels of MPO.²¹ MPO might serve as a biomarker for oxidative stress and MPO deficiency might also be associated with an increase incidence of inflammation.²² Finally, xanthine oxidase (XO), is an endogenous pro-oxidant that produces superoxide radicals during conversion of xanthine to uric acid. Increased XO activity has been reported in the erythrocytes of patients with autism.²³ The present study assessed the activity of some enzymes which are related to oxidative stress in patients with ASD and used a control group for comparison in order to find a relationship between DPP-4 and other enzymes related to oxidative stress.

Materials and Methods

Subjects

Thirty seven children with ASD (31 boys and 6 girls; ranging in ages 2-12 years) were randomly selected from the psychiatric research unit in the College of Medicine, University of Mosul. By way of comparison, 30 healthy

children (20 boys and 10 girls) in the same age range were randomly selected from the same catchment area via nursery and primary schools. The diagnosis of ASD was applied by specialist psychiatrists following the criteria for ASD in the Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition (DSM-IV). Patients with ASD were classified into three subgroups: mild, moderate and severe according to symptoms severity grade and PDD scale. Scores > 50 were considered normal; scores from 50-100 were mild; scores from 100-150 were moderate, and scores < 150 considered severe.²⁴

Ethical issues

Prior to commencement, the present study was reviewed and agreed by the research scientific committee in the College of Science, Department of Chemistry. Details of the study and related testing were shared with all families whose children were involved and their oral ascent was obtained.

Inclusion criteria:

1. ASD cases diagnosed using the DSM-IV criteria
2. Physically healthy
3. No history of brain injury

Exclusion criteria:

1. All cases with speech disorder other than PDD
2. History of intrauterine or postnatal insult
3. Physically disabled

Blood sample

Venous blood samples were collected from all groups in sterile plain tubes. Serum was separated by centrifugation at 3000 rpm after blood coagulation for 15 min. Serum samples were divided into many aliquot tubes and stored at -20 °C for subsequent enzymatic activities.

Assay of enzymatic activities

Dipeptidyl peptidase-IV (DPP-4) activity was estimated via fasting blood samples collected between 8:00 and 8:30 am. Serum was stored at -20°C until thawed to determine the enzymatic activity.

Serum DPP-4 activity was assessed at 405 nm according to the Kreisell method, which involved glycine-proline-p-nitroanilide hydrochloride as a chromogenic substrate from sigma-Aldrich Chemicals – Germany (G0513).²⁵

Glutathione-S-Transferase (GST) was assayed using conjugation reaction between GSH and 1-chloro-2, 4-dinitrobenzene (CDNB) at 340 nm.²⁶

Aryl esterase activity was determined according to hydrolysis of phenyl acetate to form phenol and acetic acid at 270 nm²⁷.

Acetyl cholinesterase (AChE): was estimated using Ellman reagent and iodide as a substrate.²⁸

Myeloperoxidase (MPO): was measured by o-dianisidine as a substrate.²⁹

Xanthine oxidase (XO) activity was determined according to oxidation of xanthine to uric acid.³⁰

Statistical analysis

Data obtained in the current study were analyzed using Statistical Package for Social Sciences (SPSS) version 11.5.

1. Standard statistical methods were used to determine the mean and standard error.

2. One way ANOVA (Duncan test) was used to compare between more than two parameters.
3. Pearson correlation was performed to identify the relationship between different enzymatic activities.

Minitab program version 14 -proportional test- was used to:

- A. Evaluate the relationship between serum DPP-4 activity and incidence of various inflammation occurring in the ASD group.
- B. Evaluate the relationship between serum DPP-4 activity and incidence of gastrointestinal disorder occurring in the ASD group.
- C. Find the percentage of various inflammation and gastrointestinal disorders which occurred among those in the ASD group.

Table 1. Enzymatic activities as mean \pm S.E and change percentage for mild, moderate and severe autism spectrum disorder patients compared to control group

Enzymes	Control mean \pm S.E	Autism spectrum disorder patients					
		Mild mean \pm S.E	% change	Moderate mean \pm S.E	% change	severe mean \pm S.E	% change
Dipeptidyl peptidase-4 μ mol/L	C 68.23 \pm 3.6	b 57.85 \pm 2.35	-15.2	A 42.86 \pm 0.7	-37.2	a 35.47 \pm 0.94	-48.0
Myeloperoxidase U/L	B 58.90 \pm 4.71	b 54.31 \pm 2.68	-7.8	A 28.21 \pm 0.97	-52.1	a 17.04 \pm 0.39	-71.1
Acetylcholine esterase U/L	B 8.13 \pm 0.39	b 8.00 \pm 0.38	-1.6	A 5.54 \pm 0.06	-31.9	a 4.16 \pm 0.21	-48.8
Aryl esterase U/L	C 84.10 \pm 2.09	c 84.4 \pm 1.31	+0.3	B 78.05 \pm 0.5	-7.2	a 66.13 \pm 2.35	-21.4
Glutathione-S-Transferase U/L	C 148.60 \pm 5.71	c 147.79 \pm 3.92	-0.5	B 110.0 \pm 1.76	-25.9	a 83.67 \pm 2.55	-43.7
Xanthine oxidase U/L	B 21.62 \pm 1.76	a 12.82 \pm 1.37	-40.7	C 28.20 \pm 0.97	+30.4	d 52.73 \pm 3.19	+143.9

S.E = Standard Error

Different letters horizontally a, b, c, d indicate that the mean is different significantly at $p < 0.05$ (in one way ANOVA- Duncan test).

Table 2. Relationship between DPP-4 activity and some pathological disorders which occurred in ASD patients and % of disorder incidence

Relationship between DPP-4 with pathological disorders	P value	% incidence
DPP-4 & inflammation	0.0001*	87.9
DPP-4 & gastrointestinal disorders	0.035*	69.7

DPP-4, Dipeptidyl peptidase-4

* Significant at ($p \leq 0.05$).

Table 3. Correlation between DPP-4 and the measured enzymes in ASD patients compared to control group

r value	DPP-4	MPO	Ach E	Aryl esterase	GST	XO
Patients group	1	0.757**	0.760**	0.655**	0.742**	-0.713**
control group	1	0.131	-0.165	-0.017	-0.029	-0.055

** Correlation is significant at the ($p \leq 0.01$)

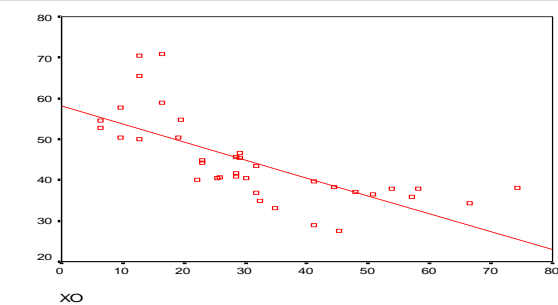
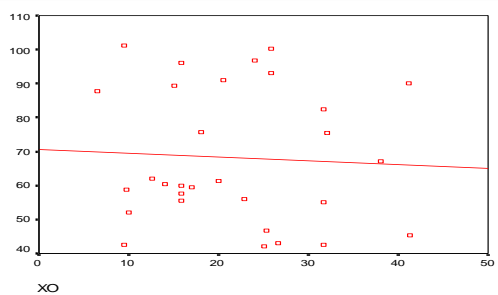
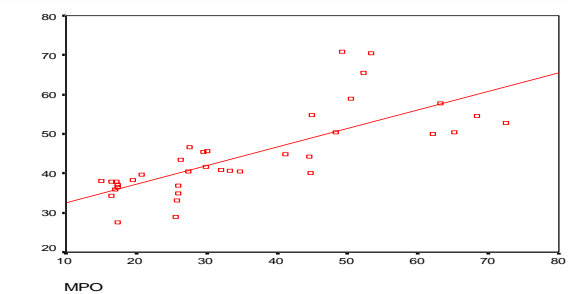
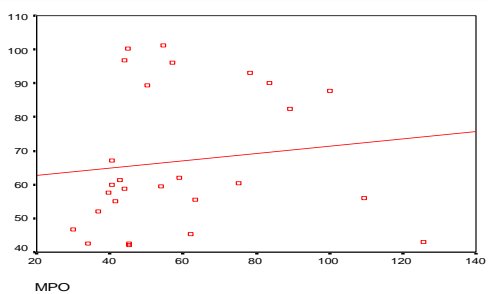
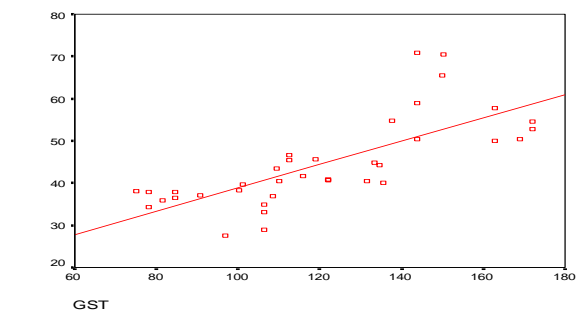
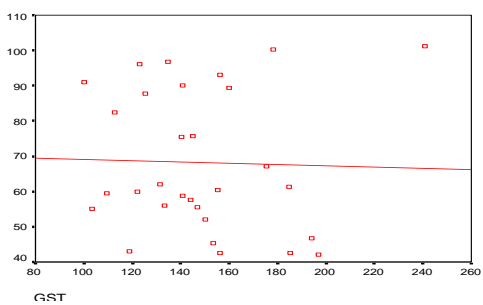
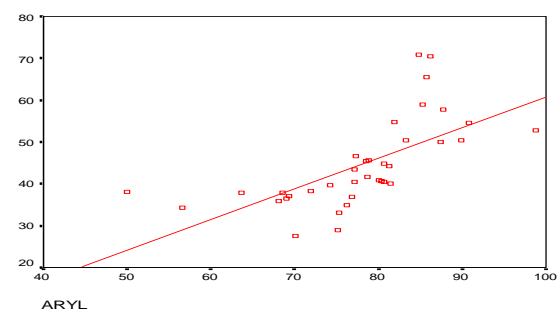
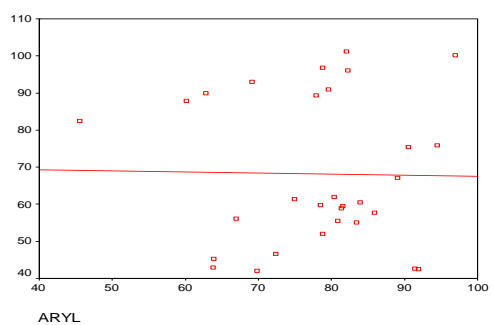
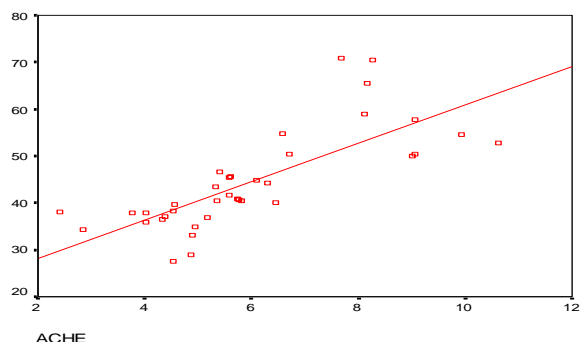
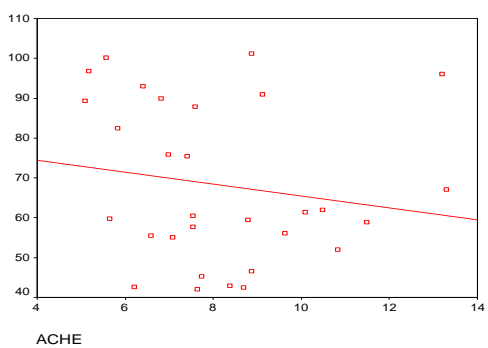
Results

Statistical analysis of all studied enzymatic activities on mild, moderate and severe autism spectrum disorder according to AL-Hayaly²⁴ compared to control group were listed in Table 1 as mean \pm S.E for each enzyme. The results indicated a significant ($p > 0.05$) decrease in DPP-4 activity in mild, moderate and severe compared to control group. Also, there was a significant ($p > 0.05$) decrease in Ach E, MPO, GST and aryl esterase activities in patients with ASD especially within the severe group while a significant ($p > 0.05$) increase of XO activity in the ASD severe group was also observed. Table 2 revealed a statistically significant ($p > 0.05$) relationship between DPP-4 activity and the incidence of various inflammation such as urinary tract infection, nasosinusitis, amygdalitis, bronchitis and between DPP-

4 activities with the incidence of gastrointestinal disorders which occurred in patients with ASD. Furthermore, the results showed the percentage of inflammation (87.9%) and the gastrointestinal disorders (69.7%) which occurred in patients with autism.

Pearson correlation between DPP-4 and other enzymes was achieved indicating r values (Table 3) and explained a significant ($p \leq 0.01$) relationship between DPP-4 activity and Ach E, MPO, GST, Aryl esterase and xanthine oxidase activities in the ASD group compared to the control group.

Figure 1 (below) demonstrated a positive significant ($P \leq 0.01$) correlation between DPP-4 and Ach E, MPO, GST and aryl esterase activities. It showed a negative significant ($p \leq 0.01$) correlation with xanthine oxidase activity in patients to the (right) compared to control group to the (left).



Discussion

The reduction percentage of DPP-4 activity level was 48% in the severe ASD group compared to control group as Table 1 demonstrates. The possible causes for the activity reduction are inconclusive. There are at least four different factors which could be proposed to reduce serum DPP-4 activity in patients with ASD, such as genetic; mercury and organophosphates exposure, gut flora and dysbiosis were associated in patients with ASD. Also it was reported that drugs which are used in type-2 diabetes mellitus treatment might act as DPP-4 inhibitors³¹.

Many people with autism suffer from digestive complaints which might make them susceptible to casomorphin, partially digested from casein, absorption reaching the brain by crossing the blood brain barrier and leading to autistic type behavior.³² There is an evidence of increasing intestinal permeability in people with ASD.³³ Gastrointestinal permeability allows larger molecules that would normally stay in the gut to cross into the blood stream.³⁴

The present study revealed a significant ($p \leq 0.05$) relationship between DPP-4 activity and gastrointestinal disorders which occurred in ASD groups. Data revealed the GI disorders incidence among the ASD groups was 69.7% as indicated in Table 2. It appears that DPP-4 activity was affected by metallothionine levels.³⁵ In persons with normal functioning, metallothionine donates zinc, which activates DPP-4. However, in people with autism, morphine like peptide produced from partially digested gluten and casein could be reacted as ligand for opioid receptor in different areas of the brain such as areas in the temporal lobes involving in speech and auditory integration.³⁶

Organophosphates and mercury were shown to inhibit metallothionine, which in turn inhibits DPP-4 activity. Children with autism show a high prevalence of DPP-4 enzyme damage⁹ and these findings are in agreement with our present results. Another significant ($p \geq 0.05$) relationship between DPP-4 activity and various inflammatory conditions which occurred in patients with autism was found in the present study as illustrated in Table 2. The data in the Table revealed the incidence of inflammation between patients as 87.9%. These results confirmed that patients with autism suffered from immunological disorder or immune dysfunction. The role and origin of soluble DPP-4 is not completely understood, but it is clear that the enzymatic activity or at least the catalytic domain of DPP-4 was involved in immune regulation by cleaving cytokines and influencing T-cell activation.³⁷ Previous studies

suggested that serum DPP-4 activity could be an additional marker that confirms the inflammatory processes, especially in the bowel,³⁸ in those with autism. Other studies suggest that the persisting immune dysbalance has significant impact on the pathogenesis of ASD.³⁴ It was concluded that serum DPP-4 activity in ASD patients correlated inversely with ASD severity grade. Also previous researcher indicated a significant correlation between ASD symptoms and impaired ability to adequately digest peptides and protein from wheat and dairy sources.³⁹ Reduced levels of DPP-4 could manifest as autistic symptoms. Indeed DPP-4 is thought to be down regulated in children with autism and is currently being used as a diagnostic marker for ASD.⁴⁰ Researchers believe that mutated gene is responsible for DPP-4 expression which was down regulated or silenced. For this reason, the addition of galactose appears to be able to increase normal DPP-4 gene expression, and the enzymatic activity becomes more than present.⁴⁰

Significant ($p > 0.05$) reduction in myeloperoxidase (MPO) activity in moderate and severe ASD groups compared to control and mild ASD group was shown in Table 1 as 52.1% and 71.1%, respectively. These results are in agreement with previous studies which showed a significant MPO activity reduction in children with autism who had GI disorders.¹⁸

MPO-deficient neutrophils produce superoxide and H_2O_2 but are unable to convert H_2O_2 to the hypochlorous acid (HOCl). As a consequence, the ability of these cells to kill bacteria seems impaired and diminished early.⁴¹ Their capacity to kill certain fungi seems completely absent in MPO-deficient neutrophils.¹⁸ Thus, it could be concluded that children with autism who also have a GI disorder have MPO-deficiency. It is unclear whether this deficiency is acquired or inherited. Since MPO deficiency is associated with oxidative stress, increased inflammation and propensity for fungal infections; all of which are the mechanisms associated with ASD.

Pregnant women are exposed to organophosphates through a wide variety of sources. Environmental toxicants such as organophosphates insecticides were proposed as one causal factor for ASD.⁹ Organophosphate will inhibit any enzyme with an active serine site including DPP-4.⁴² Furthermore, products of organophosphates inhibit other enzymes such as acetyl cholinesterase, which breaks down the neurotransmitter acetylcholine. Organophosphates are exitotoxic to the central nervous system (CNS). They work primarily through phosphorylation of acetyl cholinesterase, which helps control impulse transmission in the CNS or at the synaptic junction.⁴³ Loss of enzyme function results in

accumulation of acetylcholine, which causes unregulated impulses; the major characteristic of neurotoxicity is over stimulation of the CNS.⁴⁴ In the present study, significant reduction of acetylcholine esterase activity was shown among the ASD group when compared with the control. In addition, a positive significant ($p \leq 0.01$) correlation between DPP-4 and AChE was shown. The causes might be due to opioids tending to inhibit neuronal transmission at both pre and post synaptic neurons.³¹

Organophosphates degraded by reacting with hydroxyl radical to form Oxon compounds.⁴⁴ The Oxon compounds are more reactive and stronger acetyl choline esterase inhibitors than their parent compounds. Organophosphates are generally highly lipid soluble and could be absorbed upon exposure by the skin, mucous membrane, gastrointestinal system and respiratory system.⁴⁵ Xenobiotic such as organophosphate also inhibit aryl esterase activity and glutathione-S-Transferase (GST), which plays an important role in detoxification system.⁴⁶ There is preliminary evidence that at least one of the genes controlling paroxonase1/aryl esterase activity production is aberrant in some subjects with ASD.⁴⁷ Our results indicated a significant ($p > 0.05$) reduction in aryl esterase activity among the moderate and severe ASD groups by 7.2% and 21.4%, respectively compared to controls and those with mild ASD.

These findings are consistent with another study.¹⁴ Aryl esterase activity is considered high density lipoprotein HDL-associated esterase and the key of organophosphorous compounds detoxification. Also, a significant reduction ($p > 0.05$) in GST activity was observed among the moderate and severe ASD groups by 25.9%, 43.7%, respectively compared to controls. This could be attributed to lack of substrate availability in the participants with autism, i.e. reduced glutathione that was previously observed in the patients with autism.^{5,11} The lowered activity of GST found in the present study was consistent with the previous studies by AL-Yafee et al. and Hermawati et al.^{11,13} in which they demonstrated that GST activity was reduced in patients with autism when compared with controls.

The recorded reduction in the essential detoxifying enzymes could explain the observed poor detoxification ability in patients with autism.⁴⁶ Children can be more sensitive to environmental toxicants which induced free radical formation and oxidative stress.⁴⁹ Increased oxidative stress might lead to increase xanthine oxidase activity in ASD groups.⁴⁸ Our results were consistent with previous studies. Data in Table 1 indicated a

significant ($p > 0.05$) increased XO activity level among ASD groups especially the moderate and severe ASD groups. These results might be attributed to superoxide anion production during conversion of xanthine to uric acid. This will induce oxidative stress and consequently inflammation, immune deregulation, membrane lipid abnormalities, mitochondrial dysfunction and be the predisposing factor that might occur in patients with autism. These abnormalities might contribute in behavior, sleep disorder and gastrointestinal disturbances in patient's group.^{7,49}

Conclusion

Oxidative stress might be considered a risk factor in ASD and may impact upon several enzymatic activities. Attention has been focused on potential roles of DPP-4 activity. The correlation results suggest that there is a relationship between DPP-4 activity and studied enzymes. DPP-4 was considered to be a good marker and possesses a significant relationship with GI disorder incidence and inflammation in patients with ASD. Clearly, exposure to environmental toxicants might inhibit DPP-4 and associated enzymatic activities.

References

1. Momeni N, Bergquist J, Brudin L, et al. A novel blood – based biomarker for detection of autism spectrum disorder. *J Transt Psychiatry* 2012;2, e91:1-7.
2. Levy SE, Sounders MC, Ittenbach RF, et al. Relationship of dietary intake to gastrointestinal symptoms in children with autism spectrum disorder. *Biol Psychiatry* 2007;61: 492-497.
3. AL-Jammas IK and AL-Dobooni RM. Prenatal and perinatal risk factors in autism disorder. *Arab J of Psychiatry* 2012;23(2): 108-114.
4. Geier DA, Kern JK and Geier MA. A prospective study of oxidative stress biomarkers in autistic disorders. *Electr J Applied Psychology: Innovation in Autism* 2009;5(1): 2-10.
5. Rose S, Melnyk S, Trusty TA, et al. Intracellular and extracellular redox status and free radicals generation in primary immune cells from children with autism. *Autism Research and Treatment*. 2012; 1-10.
6. Hanasand M, Omdal R, Norheim K B, et al. Improved detection of advanced oxidation protein products in plasma. *Clinica Chimica Acta* 2012;413: 901 -906.
7. Rossignol DA and Frye RE. A review of research trends in physiological abnormalities in autism spectrum disorder: immune dysregulation, inflammation, oxidative stress, mitochondrial dysfunction and environmental toxicants exposure. *Mol Psychiatry* 2012;17: 389-401.

8. Santhanam B. Nutritional factors in autism: An overview of nutritional factors in the etiology and management of autism. *Integrative Medicine*. 2012;11(1): 46-49.
9. Al-Yafee YA, Al-Ayadhi LY, Haq SH, et al. Novel metabolic biomarkers related to sulphur dependent detoxification pathways in autistic patients of Saudi Arabia. *BMC Neurology* 2012;11,139: 1-9.
10. Al-Gadani Y, El-Ensary A, Attas O, et al. Metabolic biomarkers related to oxidative stress and antioxidant status in Saudi autistic children. *Clin. Biochem* 2009;42: 1032-1040.
11. Lad MM. Biomedical Approach For Autism –Basics-Defeat Autism Now (DAN) model. 2007.
12. Ongen G, Sargin S, Ostun O, et al. Dipeptidyl peptidase IV production by solid state fermentation using alternative fungal sources. *Turk J Biol* 2012;36: 1-7.
13. Hermwati D, Then SM, Winarni TI, et al. Lower erythrocytes GST activity in autism spectrum disorder (ASD) patients compared to normal controls. *Asia-Pacific J Mol Med* 2012; 1-2.
14. Gaita L, Manzi B, Sacco R, et al. Decreased serum aryl esterase activity in autism spectrum disorders. *Psychiatry Res* 2010;180(2-3): 105-113.
15. Pasca SB, Names B, Viase L, et al. High levels of homocysteine and low serum paroxonase 1 aryl esterase activity in children with autism. *Life Sci* 2006;78: 2244-2248.
16. Shelton JF, Picciotto IH, Pessah IN. Tipping the balance of autism risk: Potential mechanisms linking pesticides and autism. *Environ Health perspectives*. 2012;120(7): 944-951.
17. Suzuki K, Sugihara G, Ouchi Y, et al. Reduced acetyl cholinesterase activity in the Fusiform Gyrus in adults with autism spectrum disorder. *Arch Gen Psychiatry* 2011;68(3): 306-313.
18. Mc Dermott V, Vicar MC, Rabin I. Frequency of gastrointestinal symptoms in children with autistic spectrum disorder and association with family history of autoimmune disease *J Dev. Behav Pediatr* 2006;27: 128-136.
19. Kumar P, PAI K, Pandey H P, et al. NADH-Oxidase, NADPH-Oxidase and myeloperoxidase of visceral Leishmaniasis patients. *J. Med. Microbiol* 2002;51: 832-836.
20. Russo AJ, Kringsman A, Jepson B, et al. Lower serum myeloperoxidase in autistic children with gastrointestinal disease. *Clin Exp Gastroenterology* 2009;2: 85-94.
21. Honda H, Ueda M, Kojima S, et al. Assessment of myeloperoxidase and oxidative {alpha} - antitrypsin in patients on hemodialysis. *Clin J Am Soc Nephrol* 2009;(1): 142-151.
22. Milla C, Yang S, Cornfield DN, et al. Myeloperoxidase deficiency enhances inflammation after allogeneic marrow transplantation. *Am J Physiol Lung Cell Mol Physiol* 2004;287: 706-714.
23. Ragini M, Banji OJ, Banji D, et al. Biomarkers in autism. *Int J Pharm Tech Res* 2011;3(3): 1281-1289.
24. Al-Hayaly MZ. Estimation of lead level among children with pervasive developmental disorders. 2010. M.Sc. Thesis. College of Nursing University of Mosul.
25. Kreisel W, Heussner R, Volk B, et al. Identification of the 110000 Mr. glycoprotein isolated from rat liver plasma membrane as dipeptidyl amino peptidase IV. *FEBS Lett* 1982;147: 85-88.
26. Habig WH, Pabst MJ, Jakoby WB. Glutathione-S-Transferase - the first enzymatic step in mercapturic acid formation. *J Biochem* 1974;249(22): 7130-7139.
27. Tomas M, Senti M, Gareia-Faria F, et al. Effects of Smarastatin therapy on paroxonase activity and related lipoprotein in familial hyper cholesterolemic patients . *Arterioscler Thromb Vasc Biol* 2000;20: 2113-2119.
28. Ellman GL, Courtney KD, Andres V, et al. Anew and rapid colorimetric determination of acetyl cholinesterase. *Biochem Pharmacol* 1961;7: 88-95.
29. Kumar P, Pai PH, Saundar S. NADH- Oxidase and myeloperoxidase activity of visceral Leishmaniasis patients. *J Med Microbiol* 2002;51: 832-836.
30. Ackermann E, Brill AS. Xanthine Oxidase activity in method of enzymatic analysis. Bergmeyer HU, 2nd ed. Academic Press INC., USA 1974; 521-522.
31. Carpino A. Diet & Autism. *Diseases* 2013; 2.
32. Kost NV, Sokolov OY, Kurasova OB, et al. Beta casomorphine -7 in infants on different type of feeding and different levels of psychomotor development .peptides. 2009;(10): 1854-1860.
33. DeMagistris L, Familiar V, Pascotto A, et al. Alterations of the intestinal barrier in patients with autism spectrum disorder and in their first degree. *Gastroentrol Nutr* 2010; 51: 418-424.
34. Randolph-Gips MM and Srinivasan P. Modeling autism: a systems biology approach. *J Clin Bioinformatics* 2012; 2:17.
35. Ratajczak H. Theoretical aspects of autism: causes – A review. *J Immuno Toxicol* 2011;8(1): 68-79.
36. Shaw W. Biological Treatment for Autism and PDD – causes and biomedical therapies for autism and PDD- chap 6- Abnormalities of the digestive system. 2008, 3rd Ed. Great Laboratory, Inc.
37. Varljen J, Sincic BM, Baticic L, et al. Clinical relevance of the serum dipeptidyl peptidase IV (DPP-IV/CD26) activity in adult patients with Crohn's disease and ulcerative colitis .*Croatia Chemica Acta* 2005; 78(3): 427- 432.
38. Karoui S. Inflammatory bowel disease: Advanced in pathogenesis and management. Chapter 4. Role of Dipeptidyl peptidase-IV/CD26 in inflammatory bowel disease. Detel D, Pucar LB and Pugel EP, et al. 2012: 59-89.
39. Brudnak M, Rimland B, Kerry RE, et al. Beneficial effects of enzyme – based therapy for autism spectrum disorders. *Townsend Letters for doctors and patients*. 2003; 104-107.

40. Brudnak M. Application of genomeceuticals to the molecular and immunological aspects of autism. J American Naturopathic Medical Association. 2013; 4(5).
41. Nauseef WM. Lessons from MPO deficiency about functionally important structural features. JPN J Infect Dis. 2004; 57(5): 54-55.
42. Shattock P, Whiteley P. The Role of Tryptophan in autism and related disorders. The Nutrition Practitioner 2006; 1-9.
43. Robert E, English P, Grether J, et al. Maternal residence near agricultural pesticides applications and autism spectrum disorders among children in the California Central Valley. Environ Health Perspect 2007; cited by ref. 41.
44. Samson K. CDC Backed Study suggest possible link between autistic disorders. Maternal Pesticide Exposure in California. Neurology Today 2007; 1-1.
45. Manthipragada AD, Costello S, Cockburn MG, et al. Paroxonase 1 (PON1), agricultural organophosphate-exposure and Parkinson disease. Epidemiology. 2012; 2(1): 87- 94.
46. Ming X. Environmental Toxicants and autism spectrum disorder. Autism–Open Access Journal 2012; 1-2.
47. D'Amelio M, Ricci I, Liu X, et al. Paraoxonase gene variants are associated with autism in North America but not in Italy: Possible regional specificity in gene-environmental interactions. Molecular Psychiatry 2005; 10:1006-1016.
48. McGinnis WR. Oxidative stress in autism. Altern Ther Health 2005;11(1): 19-25.
49. Chauhan A and Chauhan V. Oxidative stress in autism. Pathophysiology 2006;13: 171-181.

المخلص

الأوليات: يشخص اضطراب طيف التوحد على انه ضعف في التواصل الاجتماعي والقيام بأعمال روتينية او نمطية متكررة وتظهر هذه الحالات في السنوات الثلاثة الاولى من عمر الطفل. اكدت الدراسات ان الاضطراب في الذكور يكون اكثر شيوعا مما في الاناث بنسبة 4 الى 1 وبنسبة انتشار 10000/5 وبالرغم من الابحاث والدراسات الواسعة في هذا المجال فقد بقي اضطراب طيف التوحد على انه مرض غامض ومفهوم بشكل سيء. الهدف: 1- تقييم تأثير الاجهاد التأكسدي في مرضى اضطراب طيف التوحد 2- تقييم فعالية إنزيم داي بيتايديل بيتايديز 4 للأطفال المصابين باضطراب طيف التوحد ودوره في اضطرابات القناة الهضمية وتكرار مختلف الالتهابات 3- دراسة العلاقة بين الإنزيم ذاته والإنزيمات الأخرى التي تتأثر بالإجهاد التأكسدي. العينة وطرق البحث: أعتمد المعيار-DSM (IV) في تشخيص المرضى المصابين باضطراب طيف التوحد واختيرت عشوانيا عينات سيطرة اصحاء ومن ثم تم قياس فعالية انزيمات الداي بيتايديل بيتايديز-4 والكلوتاتايون-S-ترانزفريز والاريل استريز والماليلوبروكسيدز فضلا عن الاسيتايل كولين استريز والزانتين اوكسيدز. استخدمت الطرق الاحصائية لبيان اختلاف فعالية كل انزيم بين المجاميع الاربعة وتأثير انزيم (DPP-4) في حدوث مختلف الالتهابات وكذلك تأثيره في اضطرابات القناة الهضمية. كذلك تم اختبار الارتباط ما بين الانزيم ذاته والانزيمات الأخرى قيد الدراسة. النتائج: أظهرت النتائج بوجود انخفاضاً معنوياً في فعالية إنزيم الداي بيتايديل بيتايديز-4 في المجاميع المصابة بالاضطراب للحالات الخفيفة والمتوسطة والشديدة عند المقارنة بالمجموعة الضابطة. كذلك أظهرت الدراسة بوجود انخفاضاً معنوياً في فعالية الانزيمات (MPO, Ach E, GST, Aryl esterase) خصوصاً في المجموعة الثالثة من اضطراب طيف التوحد عند مقارنتها بالمجموعة الضابطة. كذلك لوحظ ارتفاعاً معنوياً في فعالية إنزيم الزانتين اوكسيدز للمجموعة الثالثة. أظهرت الدراسة أيضاً وجود علاقة ارتباط قوية بين فعالية إنزيم الداي بيتايديل بيتايديز-4 وفعالية الإنزيمات الأخرى قيد الدراسة. الاستنتاجات: يمكن اعتبار الإنزيم داي بيتايديل بيتايديز-4 مؤشر جيد للأطفال المصابين باضطراب طيف التوحد وخصوصاً الذين لديهم اضطرابات معوية والتهابات متكررة.

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Mental Health in the Kurdistan Region of Iraq

Zerak Al-Salihi and Twana A. Rahim

الصحة النفسية في إقليم كردستان العراق

زيرك مسعود الصالحي، توانا عبدالرحمن رحيم

Summary

Iraqi Kurdistan is an autonomous area in the north of Iraq with a population of approximately five million people. Mental health practice in Kurdistan is relatively recent. The first initiative to build a mental health service dates back to the late 1970s. During the early 1980s, two specialist psychiatrists launched a new service in Erbil. Mental health, like many other services, crumbled after the destruction of Iraq following three decades of war, sanctions and civil strife that led to a severe decline in the health system. The World Health Organization (WHO), in collaboration with the Ministry of Health (MoH) of the Kurdistan Regional Government (KRG) built a new psychiatric unit. In 2009, a new psychiatric hospital was established in Sulaimanyah followed by a second one in 2012 in the same city while a third one was established in the capital Erbil in early 2013. In Kurdistan, there are many initiatives to build a healthier mental health system, but the situation remains far from perfect. In the first instance, it was important to separate the main psychiatric hospital in Sulaimanyah from the general hospital.

Keywords: Iraqi Kurdistan, Mental Health, Services.

Declaration of Interest: None.

Historical background

Kurdistan is an autonomous region in the north of Iraq with a population of approximately five million people the majority of which are Kurds. There are other smaller ethnic communities in the region, such as Turkmen, Assyrians and Arabs. Mental health practice in Iraq dates back to the Abbasid era during the 7th Century when Baghdad was the destination for medical students from all over the world. It was where the first general hospital to serve mentally ill patients was established around 982 AD, which was called Al Bimarstan Al Uthhdie by Uothid - AlDawla Al Bouihee and was known to include what was considered to be the first psychiatric unit in the world¹.

An overview of psychiatric services from the early 1980's

As far as we are aware, there has been no formal evaluation of mental health services in the Kurdistan region, which is currently undergoing a rapid transformation in terms of its infrastructure, including the health system. Mental health, like any other service, crumbled after the destruction of Iraq following three decades of war, sanction and civil strife that led to a severe decline in the health system².

From 2003, the mental health service in the Kurdistan region of Iraq has developed; however, when compared

to high income countries it may be considered inadequate. The first initiative to build a mental health service dates back to the late 1970s when a specialist psychiatrist, Dr Najat M. Yousif, became the only Kurdish psychiatrist to embark on delivering psychiatric services in the Sulaimanyah province. Dr Najat provided services to the in-patient unit, which consisted of a small unit within the general hospital with only a few beds and an out-patient clinic. He provided consultations in his private clinic in Sulaiymania. Patients used to travel to Baghdad and Mosul where better psychiatric institutions were available, including the largest asylum in Iraq (Al-Rashad Hospital) and another 70 bedded hospital (Ibn-Rushid Hospital) for patients with severe chronic mental illnesses. There were many disadvantages, however, due to the long distance patients had to travel, costs, safety issues and lack of proper follow-up care and management of medications.

It is impossible to speak about mental health in Kurdistan without appreciating the generous and unforgettable efforts of two psychiatrists, namely Professor Nazar M. Mohammed Amin and Assistant Professor Adnan A. Shakir, who both launched a new mental health service in Erbil, the capital of the region, during the early 1980s. Although the service remained broadly similar to the one provided in Sulaimanyah, which was run with limited resources and was mainly lead by doctors with no multidisciplinary input, both specialists are regarded to

be the pioneers of a very early systematized psychiatric unit with regular in-patient services in the region.

The war and its consequences

In 1991, after the second Gulf War, the country took another turn for the worse. The Kurdistan region became a de-facto, semi-independent region due to a weak central government in Baghdad and the protection provided by the international community to the Kurds in the north. The new geopolitical situation led to a state in which Kurdish graduate doctors became underprivileged and lost the opportunity to complete postgraduate training as this was only available in the territories controlled by the central government. As a result, many doctors who were willing to complete their training left the country and settled in Western Europe and North America.

The three psychiatrists, Dr Najat, Dr Nazar, and Dr Adnan, nevertheless remained the only mental health providers, besides a limited number of non-specialized nurses, serving a population of nearly four million people until the late 1990s when a Swedish non-governmental organization (NGO) called Diakonia established a mental health program focusing more on child psychotherapy both in Duhok and Erbil. A number of trainees joined the program and this attracted more trainees to psychiatry over the next few years. This can be considered a turning point for incorporating biological psychiatry alongside psychological therapies with a greater multidisciplinary involvement in terms of patient management.

The new era

After the second Gulf War in 2003, several newly graduated physicians from the region applied to the Iraqi Board for Medical Specializations (IBMS) to obtain what is known as the 'Iraqi Board' of psychiatry, a PhD equivalent degree in psychiatry. This was the first step towards a new era in Kurdistan that saw the number of qualified psychiatrists increase significantly from between three and five psychiatrists to nearly 20 in Erbil alone.

The World Health Organization (WHO), in collaboration with the Ministry of Health (MoH) of the Kurdistan Regional Government (KRG) built a new psychiatric unit, comprising 20 in-patient beds, and an adult out-patient clinic within the largest teaching hospital in Erbil, Hawler Teaching Hospital. Until recently this still continued to be the only provider of psychiatric service to the capital and surrounding towns and villages.

After 2007, another step towards improving the quality of psychiatric service in the area took place when a new wave of psychiatrists, who completed their postgraduate training at Baghdad mental health institutions, returned to Kurdistan after obtaining the 'fellowship' of Iraqi Board of Psychiatry. This was followed by the migration of a number of Iraqi Arab physicians to the region fleeing persecution and sectarian violence which targeted very skilled professionals. The peace and security in Kurdistan helped attract experienced doctors to the area and resulted in the building of many private general hospitals, but unfortunately with the exception of psychiatric hospitals.

In the UK, there are a large number of Iraqi psychiatrists who work for the National Health Service (NHS) who contributed to re-habilitating the mental health services in Iraq, including the Kurdistan region. The Iraqi subcommittee of the Royal College of Psychiatrists (RCP) is one example of many initiatives to help achieve this goal. Following a fact finding visit to Kurdistan in 2007, a number of areas were identified where the RCP could provide support³. Most notably, the overseas contribution to mental health services in Kurdistan was by the late Dr Rizgar Amin, an eminent Kurdish Consultant Psychiatrist who served as a bridge between Iraq and the UK for over 10 years.

Mental health education and training in Kurdistan, likewise, suffered comparable disadvantages with very limited exposure of medical students to psychiatry, which was part of general medicine. However, since 2000, several postgraduate training programs were established starting with the 'Psychiatric Diploma', which is a one year training program and also a more advanced training program known as 'the Kurdish Board for Medical Specializations,' which is a four years psychiatry training program. This is a new initiative by the KRG and the bill was recently approved by the Kurdistan Parliament.

In contrast to specialist psychiatric hospitals in Baghdad, psychiatric units in Kurdistan have always been non-independent or part of a general hospital. This of course has many disadvantages and has hampered the process of innovation and strategic planning. Similar to other sectors of the ancient health system in Iraq, the mental health sector has a hierarchical bureaucratic system in place with very limited resources available to use at hospital levels. To tackle this problem, in 2009 the first specialist psychiatric hospital was established in Sulaimanyah. More recently, a second specialist hospital

was launched in the same city in 2012 and by 2013 a third hospital was established in the capital Erbil. This was merely a transformation of the old mental health unit in the general hospital to a separate independent unit. Improvement in the service has yet to be achieved after the separation of mental health from the acute general hospital, but it is anticipated that this will bring greater investment to the mental health sector.

Work with NGO's

Before 2003, Iraq was an isolated country. Kurdistan became open to the outside world after its liberation from Saddam's forces in 1991. Large international organizations established bases in Iraq⁴. In particular, there was a focus on trauma survivors and, as a result, many trauma centers were established. A child mental health training center was founded in Duhok in collaboration with Uppsala University in Sweden⁵.

Table 1 showing the current available services and professionals in Kurdistan region of Iraq

Province	Number of beds	Number of psychiatrists	Number of trainees	Primary mental health committee	Autism support committee	Mental disorder social support committee	Psychiatric appeal Committee	Rehabilitation centers	Social Workers	Psycho - therapists	OT
ERBIL	80	20	1	1	1	1	1	0	0	0	0
SULAYMANIA	168	9	8	1	1	1	0	1	6	6	3
DUHOK	15	7	3 Senior residents	1	1	1	0	0	1	0	0

Interestingly, there are a relatively large number of physiotherapists who graduated from the Institute of Physiotherapy in Kurdistan with special training in dealing with psychiatric patients and who work with mental health teams in both Sulaimanyah and Duhok; however, none are in Erbil.

Mental Health Act

The Mental Health Act provides an international framework to treat patients and protect their rights from unwarranted detention or compulsory treatment⁶. The consultation document was produced by the Department of Health in Kurdistan and a draft proposal was put forward for discussion in the Kurdish Parliament. The proposal was also shared with a number of Iraqi Consultant Psychiatrists in the UK.

For some time, it has been recognized that mental health legislation is needed to treat patients who refuse to seek medical input and to safeguard vulnerable patients. This will help to reduce the abuse, humiliation and sometimes violence that patients with severe and enduring mental illnesses can be subjected to by providing a reliable systematic approach for dealing with such patients.

Conclusion

Although history suggests that Iraq was the place where the first mental health hospital existed, the devastating effect of three decades of war has left mental health

services far from perfect. In Kurdistan, there are many initiatives to build a healthier mental health system with a significant improvement mainly in the number of psychiatrists. The impact of separating mental health from general hospitals needs further evaluation. There is still a long way to go to introduce a functioning multidisciplinary style of working with an urgent need to invest in community-based psychiatry, which seems to be non-existent at present.

References

1. Younis M. Historical highlights on mental health education in Iraq. *J Fac Med*. 2009; 51: 275.
2. Abed R. An update on mental health services in Iraq. *Psychiatric Bulletin*. 2003; 27: 461-2.
3. Abed R, Alyassiri M, Al-Uzri M, et al. A visit to Iraqi Kurdistan (letter). *International Psychiatry*. 2008; 5:102-3.
4. Al-Uzri M, Abed R, Abbas M, et al. Rebuilding mental health services in Iraq. *International Psychiatry*. 2012; 9: 68-60.
5. Ahmed A. Introducing child mental health in medical curriculum in Duhok. *Duhok Medical Journal*. 2009; 3(1): 12-24.
6. Zigmond T. Principled mental health law. *International Psychiatry*. 2012; 9: 53-4.

المخلص

كوردستان هي إقليم تتميز بحكم ذاتي في شمال العراق وتتعايش حوالي خمسة ملايين نسمة في أرجائها. الصحة النفسية هي حديثة نسبياً في هذا الإقليم، حيث لا تتعدى الجهود الأولية لبناء خدمات الصحة النفسية حقبة السبعينات من القرن الماضي. في بداية الثمانينات استحدث طبيباً مختصاً خدمة صحية نفسية في مدينة أربيل. ولكن شلت الصحة النفسية حالاً ببقية قطاعات الصحة مع الدمار الذي لحق بالعراق والنظام الصحي بشكل عام جراء وبلاّت ثلاثة عقود من الحروب والمقاطعة الدولية والنزاعات الأهلية. ساهمت منظمة الصحة العالمية مع وزارة صحة الإقليم في بناء وحدة نفسية حديثة في مدينة أربيل. ولكن ترجع تاريخ افتتاح أول مشفى نفسي متخصص إلى عام 2009 في مدينة سلیمانيّة. كذلك تم افتتاح مشفى نفسي ثاني في المدينة ذاتها في عام 2012 و مشفى ثالث في مدينة أربيل. بالرغم من عدم نضوج الصحة النفسية، هناك محاولات وجهود جديّة للنهوض بالصحة النفسية في إقليم كوردستان.

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Mental Health in Palestine: Country Report

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الصحة النفسية في فلسطين

سماح جبر، مايكل مورس، وسيم السراج، بشرى عويدي

Abstract

Individuals living in Palestine face obstacles in daily living and in the access of mental health services that are unique to the Palestinian context. Social and political disruptions, starting with large-scale displacement of the indigenous Palestinian population during the 1948 Nakba and continuing with the occupation, have brought the population under considerable psychosocial stress. Such disruptions have fragmented the delivery of mental healthcare and are the distal cause of numerous barriers to care. Palestinian mental health professionals and partnering colleagues ought to work towards an integrated system of care in which patients are seen as core members of interdisciplinary mental health teams, in which mental healthcare is integrated with the rest of medical care, in which Palestinian mental health professionals and institutions form mutually enriching long-term partnerships with international colleagues and institutions, and in which mental healthcare is integrated into a broader agenda of public health, human rights, and social liberation.

Key words: Palestine, integration, occupation, human rights, international partnerships.

Declaration of Interest: None.

Introduction

Meeting the need for mental health care for the population in Palestine is an ongoing struggle. The overall population of Palestine is 4.4 million,¹ divided between the non-contiguous areas of the West Bank (2.3 million²), Gaza (1.8 million³), and East Jerusalem (270,000⁴) within the occupied Palestinian territory. A central event in Palestinian history is the 1948 Nakba, the Arabic word for Catastrophe, during which hundreds of thousands of Palestinians were uprooted from their homes and became refugees in Gaza, the West Bank, and surrounding countries. From 1948 until 1967, Egypt administered Gaza and Jordan administered the West Bank. Since 1967, the Israeli occupation has had a crushing impact on life in Palestine through imposing poverty, unemployment, pervasive violence, trauma, and imprisonment, the restriction of resources (such as water, building materials, and electricity), and intermittent restrictions of movement.⁴ Consequently, the unemployment level is 20% and 31%⁵ in the West Bank and Gaza respectively; the median family size in the West Bank is 5.4 with an average income per adult being 9 USD/day;⁶ in Gaza the average size is 6, with an average income per adult being 5 USD/day. Such social inequality likely places Palestinians at greater risk of mental disorders.⁷ Israeli state policies have generally worked to undermine any moves towards political, economic, or health sector independence and self-sufficiency on the part of Palestinians.⁸ In addition to

global effects on Palestinian wellbeing, the economic, political, military, and social situation imposes notable stresses both chronic and acute, which have bearing on undermining the mental health of the population.

A focus on only one aspect of the Palestinian reality offers some insight into its mental health challenges. Approximately 40% of the men in the Occupied Palestinian territory have been detained by Israel, often for indeterminate periods for no specific charges and often suffering mistreatment or outright torture while detained.⁹

Epidemiology

It is within this challenging political and economic context that we find little in the way of epidemiological data on mental illness in Palestine. In this regard, the World Health Organization (WHO) claims that for mental health data in Palestine “No reliable national data exists.”¹⁰ In the absence of reliable epidemiologic data, it is reasonable to assume that most common mental disorders occur at roughly the same rate in Palestine as they do globally, and indeed the WHO estimates that 5%–10% of the population in the occupied Palestinian territory may currently suffer some form of common mental disorder¹⁰. Certain disorders such as alcoholism and anorexia are far less common in Palestine than in many places due to cultural attitudes that vary from those in the West. Injection drug use in Palestine is uncommon, but a growing concern.¹¹

The limited data that does exist are prone to inaccuracies: this is a consequence of a political climate that incentivizes the leveraging of ‘research’ for ideological agenda(s), as noted by the UK based psychiatrist Derek Summerfield.¹² For example, a 2007 study of 229 adolescents in Gaza found that 69% had signs of post-traumatic stress disorder (PTSD), 95% experienced anxiety and 40% exhibited symptoms of depression.¹³ Similarly a study conducted after Operation Cast Lead, in 2010, found that only 1.3% of children did not show any signs of PTSD.¹⁴ Juxtaposed to data from these sorts of studies, our clinical experience in Gaza has shown that patients diagnosed with PTSD often meet full criteria for depression or a common anxiety disorder but do not meet full PTSD criteria. This observation also has been acknowledged by the well-respected Gaza based psychiatrist Dr Eyad El Sarraj.¹⁵ Likewise, claims that 40% of the Palestinian population is depressed are suspect.¹⁶ In our clinical experience we have observed that many Palestinians experiencing social distress will articulate it through high scores on self-reports on depression questionnaires but in fact have no impairment in functioning and do not meet DSM criteria for depression.

If the rates of most mental disorders in Palestine are similar to global rates, this would mean that there are roughly 40,000 Palestinians with schizophrenia and roughly 400,000 who will experience one or more major depressive episodes at some point in their lifetime. The WHO estimates that only 4,500 patients reach services yearly;¹⁰ however, we believe the number is much more than that.

Systems of care

It is readily apparent that the Palestinian mental healthcare system cannot presently meet the needs of the population. Nonetheless, as is the case with epidemiology, we lack reliable system-wide data on the system of care. What is known: There is one governmental psychiatric hospital in Bethlehem with roughly 80 acute care and 20 long-term care beds and there is one governmental psychiatric hospital in Gaza with roughly 20 male and 20 female beds.¹⁷ Both the Gaza and West Bank governments run community mental health systems, which, according to the WHO statistics, treat a subset of the 4,500 patients who receive treatment yearly.¹⁰ There are also a few non-governmental organizations, which run mental health or counseling centers in the West Bank and Gaza. A small number of psychiatrists do provide private sector medication management and psychotherapy. While

published data counts 20 Palestinian psychiatrists in the West Bank and Gaza combined,¹⁸ we believe that there are now roughly 20 psychiatrists in the West Bank and 10 in Gaza. There are only a few doctoral level psychologists. There are hundreds of bachelors and masters level psychologists and social workers; however, programs providing this level of training lack substantial clinical exposure. It is likely that management of many mental health problems is provided by general practitioners and neurologists; however, there are no formalized systems through which general practitioners can refer or receive consultation on patients with complicated psychiatric presentations. It is again worth noting that the provision of healthcare has been undermined by the occupation and the political situation that Palestinians face.

Barriers to care

Given the shortages in health care personnel and absence of formalized referral systems, patients face numerous barriers to care. One major barrier is awareness. Insofar as many Palestinians are not aware of mental health issues and how they present, behaviors associated with depression and other common illnesses are often not understood to be psychiatric problems. For example in one survey of mothers in Gaza, only 19.6% perceived suicidal behavior as a manifestation of mental health problems.¹⁹ Patients may be labeled pejoratively, viewed as lazy or perhaps crazy, but there is not a widespread understanding that they suffer from a treatable medical condition. Even if mental illness is recognized as such, stigma may prevent or delay patients from presenting;²⁰ both internalized stigma, through which patients devalue themselves, and family concerns about social standing or marriage prospects for other siblings often lead families to avoid mental health services. Finally, physical access to services can represent an insurmountable barrier.

Today, care in Palestine is divided up into three separate regions: the West Bank, Gaza, and East Jerusalem. Although Gaza is only 50km from the West Bank and East Jerusalem is physically contiguous with the West Bank, restrictions on freedom of movement substantially limit patients from receiving care outside of their own area of residence. Even within the West Bank, the areas controlled by the Palestinian Authority are segregated from each other in a Bantustan-like formation,²¹ leading to intermittent difficulties for patients from one part of the West Bank accessing services in another part of the West Bank. The cost of treatment and of medications and the inconsistent availability of medications on the WHO essential medicines list present additional access issues.

Recommendations

Improvements in the Palestinian system of mental healthcare will best be achieved through vertical and horizontal integration of mental health services and the flattening of hierarchies.

- Efficient and effective care provision requires multidisciplinary teams. To expand the reach of the limited number of Palestinian psychiatrists, mental health centers should empower a non-physician professional team member, such as a psychologist or social worker, to be the primary clinical point of contact for patients. The therapist also interfaces with collateral contacts including the patient's family for assessment and treatment planning purposes, facilitates case management and other needed non-medical services, and calls on the psychiatrist as needed. While the psychiatrist remains responsible for the care overall, she is not central to every aspect of care; indeed, she is only called on to do those things that psychiatrists can do. It is worth noting that the patient and patient's family should also be thought of as team members, especially given that the traditional family structure in Palestine remains strong. Efforts to educate the patient and family pay off in increased patient adherence.^{22,23} One of us, a psychiatrist, serves as medical director of a community mental health center in Ramallah, Palestine and administrates the center in accordance with this principle. In our experience it is highly efficient and well received by Palestinian patients.
- Mental healthcare must also be integrated into general medical care - expanding primary care providers' capacity to screen for and treat common mental disorders and to refer patients with complicated presentations to specialists. Such work, along with awareness raising and anti-stigma campaigns, will reduce many barriers to care. Such efforts are already underway through a joint Palestinian/WHO venture using the WHO mental health gap framework. One of us, a psychiatrist, has been involved in this work at the advisory level and has personally trained more than 250 primary care clinicians in 2011 in the basics of mental health diagnosis and treatment. While we lack system-level data, our clinical experience indicates that this training²⁴ has markedly increased referrals from primary care providers.
- Additionally, the newest research tells us that the best medical outcomes are associated with integrated treatment plans for medical and mental disorders: for example, the unified treatment of heart disease and depression. Public health initiatives can and should be developed that integrate diagnosis and treatment for both mental health and general medical disorders at the point of service delivery.
- International partnerships to expand Palestinian mental health sector human resources and research capacity are also advisable. Numerous cooperative endeavors are currently underway including continuing mental health education and the provision of psychiatry residency and fellowship training,²⁵ a multi-institution research collaboration on neuroscience²⁶ an ongoing 4+ year relationship between British Cognitive Behavioral Therapy trainers and Palestinian clinicians to disseminate CBT within Palestine, and an ongoing partnership which three of us are affiliated, which facilitates medical education-related training, research, and writing partnerships between Palestinians and internationals. Such efforts should also advance the implementation of electronic medical records that will facilitate the collection of much needed epidemiologic, quality improvement, and outcomes data. International partnerships have the potential to advance research breadth and depth, and they must prioritize research that is salient to Palestinian policy makers and front line clinicians.²⁷
- Finally, the Palestinian mental healthcare system and its international partners must place public health and human rights, including the right to self-determination, as a cornerstone of the mental health agenda. Current research indicates that for common mental disorders, genes and environmental factors in isolation from each other have little predictive power.²⁸ Instead, it is the interaction of genes with environmental risk factors, including stressors related to war, occupation, unemployment, and economic deprivation, which predict mental illness. Thus psychiatrists should focus on prevention by strengthening human rights for women and children as vulnerable groups, by protecting patient rights thorough legislation such as mental health acts, and by addressing upstream risk factors like family violence,

community violence, and ethnic/military violence. Psychiatrists must be on the forefront of integrating the world of biomedicine with social realities, demonstrating how efforts to improve mental health must include a human rights and social liberation agenda. And psychiatrists must also speak candidly that without political and economic independence, Palestinian policy planners will be constrained in implementing needed system improvements.

Conclusion

Efforts to build and sustain healthcare systems are challenging worldwide: in Palestine those challenges are compounded by an occupation and related social, political, and economic disruptions which intrude on almost every aspect Palestinian life. Consequent fragmentation of the mental health system and associated barriers to care prevent many patients from seeking needed treatment. To address this situation, the system needs to move toward vertical and horizontal integration of services. The patients and their families should be seen as core members of interdisciplinary, nonhierarchical mental health teams; mental healthcare should be integrated into the rest of medical care and public health, with an emphasis on prevention; and partnerships between Palestinians and internationals should support cooperation on medical education, research, and service delivery endeavors. In Palestine in particular, where social, political, and economic injustice are such potent factors in society-wide and individual patient wellbeing, psychiatrists must promote an understanding that mental health is intricately tied to human rights and social liberation.

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References

1. West Bank and Gaza. 2013; Available at: <http://data.worldbank.org/country/west-bank-and-gaza>.
2. http://www.ochaopt.org/documents/opt_nonsector_unrw_a_population_census2007_jan_2010.pdf [Accessed 5 Oct 2013].
3. CIA. The World Factbook. [Online] Available from: <https://www.cia.gov/library/publications/the-world-factbook/geos/gz.html> [Accessed 5 Oct 2013].
4. United Nations Office for the Coordination of Humanitarian Affairs occupied Palestinian Territory. East Jerusalem Key Humanitarian Concerns. [Online] Available from:
5. http://www.ochaopt.org/documents/ocha_opt_jerusalem_report_2011_03_23_web_english.pdf [Accessed 5 Oct 2013].
5. Palestinian Central Bureau of Statistics. Press Release on the Results of the Labour Force Survey. [Online] Available from: <http://www.pcbs.gov.ps/site/512/default.aspx?tabID=512&lang=en&ItemID=790&mid=3172&wversion=Staging> [Accessed 5 Oct 2013].
6. United Nations. Socio-Economic and Food Security Survey West Bank and Gaza Strip, occupied Palestinian territory. [Online] Available from: <http://unispal.un.org/UNISPAL.NSF/0/75CC20E011B5C5B985257A46004E6518> [Accessed 5 Oct 2013].
7. University of Cambridge. Schizophrenia linked to social inequality. [Online] Available from: <http://www.cam.ac.uk/research/news/schizophrenia-linked-to-social-inequality> [Accessed 5 Oct 2013].
8. Roy S. The Gaza Strip: The Political Economy of De-Development. Washington D.C: Institute for Palestine Studies; 1995.
9. Jabr S. Case Report: Imprisonment and Torture Triggered Psychopathology. *Impuls Journal of Psychology-Special Issue on Trauma*. 2008;; 74-79. [Accessed 7 Oct 2013].
10. World Health Organization. Transforming mental health services and attitudes: phase 2 of EU-funded mental health initiative in the West Bank and Gaza Strip. [Online] Available from: <http://www.emro.who.int/palestine-press-releases/2012/transforming-mental-health-services-and-attitudes-palestinian-moh-and-who-launch-phase-2-of-eu-funded-mental-health-initiative-in-west-bank-and-gaza.html> [Accessed 5 Oct 2013].
11. United Nations Office of Drugs and Crime. Feasibility study to set up an OST program in the Palestinian authority. Palestinian Ministry of Health, United Nations Office of Drugs and Crime. 2013.
12. Summerfield D. The invention of post-traumatic stress disorder and the social usefulness of a psychiatric category. *BMJ: British Medical Journal* 2001;322 (7278):95.
13. Elbedour S, Onwuegbuzie AJ, Ghannam J, Whitcome JA, Hein FA. Post-traumatic stress disorder, depression, and anxiety among Gaza Strip adolescents in the wake of the second Uprising (Intifada). *Child Abuse Negl* 2007 7;31(7):719-729.
14. Canada-Palestine Support Network. Trauma, grief, and PTSD in Palestinian children victims of War on Gaza. [Online] Available from: http://www.canpalnet.ca/mambo/index.php?option=com_content&task=view&id=442&Itemid=1 [Accessed 5 Oct 2013].
15. El-Sarraj E. Personal communication: Wasseem El-Sarraj January 1st, 2013.
16. Forbes. A Young Doctor Fights The Depression Epidemic In Palestine. [Online] Available from:

- <http://www.forbes.com/sites/bruceupbin/2013/02/27/a-young-doctor-fights-the-depression-epidemic-in-palestine/> [Accessed 5 Oct 2013].
17. Oweida S. Interviewed by: Bushra Awidi October 2013.
 18. Palestinian National Authority Ministry of Health. Palestinian National Health Strategy 2011-2013 Setting Direction - Getting Results. [Online] Available from: http://www.lacs.ps/documentsShow.aspx?ATT_ID=4764 [Accessed 5 Oct 2013].
 19. Thabet A, El Gammal H, Vostanis P. Palestinian mothers' perceptions of child mental health problems and services. *World Psychiatry*. 2006; 5 (2): 108.
 20. Al-Krenawi A, Graham J, Al-Bedah J, Kadri E. Cross-national comparison of Middle Eastern university students: help-seeking behaviors, attitudes toward helping professionals, and cultural beliefs about mental health problems.. *Community mental health journal*. 2009; [Accessed 17 Oct 2013].
 21. Eid H. Al Shabaka. Declaring an Independent Bantustan. [Online] Available from: <http://al-shabaka.org/node/307> [Accessed 5 Oct 2013].
 22. Prochaska J, Redding C, Evers K. Transtheoretical Model and Stages of Change. In: Unknown. (eds.) *Health Behavior and Health Education*. San Francisco: John Wiley & sons; 2008. p. 72-121.
 23. Jabr S, Morse M, Berger E. *Behavioral Health Aspects of Diabetes Management: A Manual for Palestinian Primary Care Providers*. United Nations Relief and Works Agency. 2011.
 24. Jabr S. *Integration Program of Mental Health in Primary Health Care*. World Health Organization/Palestinian Ministry of Health. 2011.
 25. The International Medical Education Trust. *Providing Healthcare Education Worldwide*. [Online] Available from: <http://www.imet2000.org/> [Accessed 5 Oct 2013].
 26. Palestinian Neuroscience Initiative. Untitled. [Online] Available from: <http://neuroscience.med.alquds.edu/> [Accessed 5 Oct 2013].
 27. Chalmers I, Essali A, Rezk E, Crowe S. Is academia meeting the needs of non-academic users of the results of research?. *The Lancet*. 2012; 380: 43.
 28. Caspi A, Sugden K, Moffitt T, Taylor A, Craig I, Harrington H, Mcclay J, Mill J, Martin J, Braithwaite A, Others. Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science Signaling*. 2003; 301 (5631): 386.

المخلص

يواجه الأشخاص الذين يعيشون في فلسطين عقبات في حياتهم اليومية وفي الوصول إلى الخدمات النفسية ذات طبيعة خاصة للفلسطينيين. الاضطرابات الاجتماعية والسياسية، بدءاً من نزوح السكان الفلسطينيين الأصليين على نطاق واسع خلال نكبة عام 1948 والمستمّر مع الاحتلال، وضعت السكان تحت الضغط النفسي والاجتماعي الكبير. لقد أدت مثل هذه الاضطرابات إلى تعطيل إيصال الخدمات النفسية كما أنها كانت سبباً رئيسياً في إيجاد الحواجز للوصول إلى الرعاية. يجب على المهنيين العاملين في مجال الصحة النفسية وعلى مشاركيهم العمل للوصول إلى نظام متكامل للرعاية يكون فيه المرضى أعضاء أساسيين ضمن فريق العناية النفسية متعدد التخصصات، بحيث تكون الرعاية النفسية متكاملة مع بقية الرعاية الطبية، وبحيث يكون بين المهنيين في الصحة النفسية الفلسطينية ومؤسسات الرعاية النفسية شراكة غنية طويلة الأمد مع زملائهم في العالم ومع المؤسسات العالمية. وبذلك تصبح الرعاية النفسية مندمجة مع أجندة واسعة تشمل الصحة العامة وحقوق الإنسان والتحرر الاجتماعي.

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