

## Epidemiology of Schizophrenia and Related Disorders in the Arab World

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وبائيات الفصام والإضطرابات المتعلقة به في العالم العربي

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### Abstract

**O**bjective: Mental health research has been increasing over the past 40 years in the Arab world. Reviews on several topics in this region were conducted including suicide, substance use disorders, anxiety disorders and attention deficit and hyperactivity disorder so as to update clinicians, researchers, and students alike about such research. The aim of this paper is to address the topic of schizophrenia and related disorders. **Method:** A review was conducted up until 2007 using specific keywords and several search engines (PubMed, PsycInfo, and IDRAAC web database) to identify relevant articles. **Results:** Despite the scarcity of literature on schizophrenia and related disorders in the Arab world, a variety of topics emerged from the current research. According to the publications identified, the prevalence of psychotic disorders ranged between 0.7% and 5.6% with no highlighted gender differences. Several studies examined comorbidity among psychotic disorders and substance use or depression, and/or the burden related to psychotic disorders (stigma and discrimination, family burden, burden of criminality, burden of lack of treatment, fertility and death related issues). **Conclusion:** There is an unmet need for national studies on schizophrenia and related disorders in this region of the world to identify the magnitude of the problem, and consequently to inform the future direction of research and clinical practice.

**Keywords:** Arab, Epidemiology, Psychotic disorders, Schizophrenia

**Declaration of interest:** None

### Introduction

A review of mental health research in the Arab world identified a steady increase in the number of publications over a 33 year period (1966-1999), despite limited funding allocated for research by Arab governments<sup>1,2</sup>. An update of this assessment will be published soon. To date, reviews on suicide<sup>3,4</sup>, substance use disorders<sup>5</sup>, anxiety disorders<sup>6</sup>, and attention deficit and hyperactivity disorder<sup>7</sup> have been published. The purpose of these reviews was to update clinicians, researchers, and students alike about current research in the Arab world. This present paper reviews the epidemiology of schizophrenia and related psychotic disorders in the Arab world.

### Methods

The Institute for Development, Research, Advocacy and Applied Care (IDRAAC), in association with the Department of Psychiatry and Clinical Psychology at Saint George Hospital University Medical Center and Balamand University (Lebanon) has conducted an exhaustive literature review on schizophrenia and related psychotic disorders in the Arab world up until the end of 2007. The search for the articles was conducted using PsycINFO, PubMed, and IDRAAC search engine (www.idraac.org, which includes a

compilation of references from various databases). The keywords used in the search included: affective flattening, alogia, avolition, catatonic, catatonia, delusion, disorganized speech, disorganized behavior, hallucination, negative symptom, paranoid, psychosis, psychotic, residual, schizo affective, schizophrenia, and schizophreniform. In addition to the following countries and regions: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, UAE, Yemen, Arab, Gulf, Gaza and Middle East. The search was not restricted to any language.

The exclusion criteria for references were: non-epidemiologic studies (e.g. clinical trials, case-control studies), non-Arab samples, or dissertation abstracts. After screening all the abstracts resulting from the search, full texts of relevant articles were retrieved either online or requested from the authors (via both regular and electronic mails in addition to repeated reminders). The content of these articles were either included in this review or used to back search other studies through their reference lists. At the end, 18 articles were included in the current review (Table 1).

Table 1. List of the publications included in this review

Country	Reference No	Date of study	Sample	Instruments (Diagnostic System)
Algeria	28	1963-1986	Cases of misdemeanor who made psychiatric consultations (n =3662)	Structured Questionnaire Classification Française des Troubles Mentaux
Bahrain	9	1988-1996	Inpatients with schizophrenia (n=325)	
Egypt	19	2001	Psychiatric inpatients (n=100)	Structured Clinical Interview for DSM-III-R Mental Disorder-I, Structured Clinical Interview for DSM-III-R Mental Disorder-II, Beck Depression Inventory,

				Positive and Negative Syndrome Scale (DSM-IV)
Egypt	34	2000	Psychiatric inpatients (n=520)	
Egypt	35	2005	Psychiatric clinical group and control group (n=765)	Arabic Scale of Death Anxiety
Kuwait	29	1992	Prisoners (n=69)	
Lebanon	18	1979-1992	Psychiatric inpatients (n=222)	Hospital charts (DSM-III-R)
Morocco	17	1999	Patients with schizophrenia (n=183)	(ICD-10)
Morocco	21	2004	Family members of psychiatric outpatients (n=100)	Structured Questionnaire
Morocco	30	2004	Outpatients with schizophrenia (n=400)	(DSM-IV)
Qatar	16	1996 -2004	Inpatients and/or outpatients that were diagnosed with acute and transient psychotic disorders (n=174)	Database of the Department of Psychiatry (Section of Medical Records) ( ICD-10)
Sudan	20	2005	Community living psychiatric patients (n=150), control group (n=211) and caregivers group (n=150)	WHO- Quality of Life Instrument (ICD-10)
Sudan	22	1978	Adult health patients & their companions (n=183)	Structured Questionnaire of Malhotra and Wig <sup>23</sup>
Sudan	24	2005	Schizophrenia caregivers (n=98) other caregivers & control group (n=189)	WHO-Quality of Life Instrument (ICD-10)
UAE	8	1989	Community sample (n=300)	Present State Examination Arabic version 9th edition (ICD-9)
UAE	10	1996	Community sample (n=1394)	Arabic Composite International Diagnostic Interview, Structured Clinical Interview for DSM-III-R Mental Disorders, Self Report Questionnaire-20 Arabic, General Health Questionnaire, (ICD-10, DSM-IV)
UAE	13	1996-1997 & 1 year later	Community sample (n=245)	Composite International Diagnostic Interview, Structured Clinical Interview for DSM-III-R Mental Disorders
UAE	33	1993	Psychiatric inpatients (n=248)	Hospital charts (ICD-10)

## Results

### Prevalence

The studies assessing prevalence and incidence of schizophrenia and related disorders were from Bahrain, Qatar, Morocco, and United Arab Emirates.

The Dubai Community Psychiatric Survey, conducted by Ghubash et al<sup>8</sup>, assessed the prevalence of psychiatric disorders and their socio-demographic correlates in 300 randomly selected women who were mainly native Arabs and third generation Iranian migrants aged between 15 and 65. The authors used the Present State Examination (PSE-ID-CATEGO) system. Women with organic mental disorders, neurological disease or mental retardation were excluded from the study. The psychiatric morbidity rate (Index of Definitions  $\geq$  5) was found to be 22.7% (n=68), with around three quarters of the case group (n=53) at threshold level. The prevalence of mania and psychotic disorders was found to be 1.9% (n=6), with 0.3% (n=1) having schizophrenia of the catatonic type according to ICD- 9 criteria, 0.3% (n=1) having other paranoid states, and 1.3% (n=4) having manic-depressive psychosis of manic type.

The second study was conducted by Abdul Karim and Al Haddad<sup>9</sup> and aimed at evaluating the incidence of schizophrenia at first hospital admission in Bahrain.

Three hundred twenty five patients with schizophrenic disorder were admitted between 1988 and 1996 (200 males and 125 females). The authors thus reported an average annual incidence rate in Bahrain of 1.29 per 10,000 for all ages and 2.13 for the 15 to 54 age group.

The third study, the Al Ain Community Psychiatric Survey I<sup>10</sup>, was a community study that assessed prevalence of schizophrenia and related disorders in a general population in an Arab region. The assessment was made using the Composite International Diagnostic Interview (CIDI) version 1.1<sup>11,12</sup>. The study was based on a sample of 1394 adults drawn from the general population of United Arab Emirates nationals living in the city of Al Ain. Of that sample, 49.1% were females; most respondents were aged between 18 and 40, and two-thirds were married (68.3%). The study yielded a total lifetime prevalence rate of 8.2 % (95% CI [6.7-9.7]) for ICD-10 psychiatric disorders with a female: male ratio of 2.3. For ICD-10 schizophrenia and related disorders, the total lifetime prevalence rate was found to be 0.7% (95% CI [0.2-1.2]). The authors note, however, that this figure may be understated, given the exclusion of highly disturbed and cognitively impaired individuals from the survey and the stigma associated with mental illness (especially for men), perhaps even more so with schizophrenia and related disorders. It is worth

mentioning that the authors did not survey institutionalized individuals, which further indicates that the prevalence figure may be understated.

The same authors<sup>13</sup> had previously conducted the Al Ain Community Psychiatric Survey of Psychiatric Morbidity III, in order to estimate the incidence of mental disorders from the Al Ain Community Survey of Psychiatric Morbidity and the remission rate of the threshold and subthreshold disorders 12 months after the original assessment, as well as the effect of utilization of services on the remission rate. The final sample consisted of 245 subjects, with a mean age of 34.1 +/- 12.02. Fifty one percent (n= 125) had no DSM-III-R psychiatric disorder, 32% (n=79) had subthreshold disorders and 17% (n=41) had DSM-III-R psychiatric disorders (threshold). All subjects were assessed 12 months later for follow-up, using the Structured Clinical Interview for DSM-III-R mental disorders (SCID) version 1.0<sup>14</sup>. The annual incidence rate of all mental disorders was found to be almost 11%. At baseline, 5 out of 245 subjects suffered from schizophrenia and bipolar disorders (no data is available on each). At follow-up, 4 subjects out of the 5 were still suffering from their illness. The authors believe this indicates that spontaneous remission in their community is less likely in the case of psychotic disorders.

A national epidemiological study, unpublished but conveyed to the authors by Moussaoui, was conducted in Morocco in 2003-2004 to assess the prevalence of mental disorders in a representative sample of the general population 15 years of age and above using the Mini International Neuropsychiatric Interview (MINI) as instrument of interview<sup>15</sup>. The study found that the prevalence of psychotic disorders was 5.6%.

In a retrospective hospital based study, Shaltout et al.<sup>16</sup> assessed the occurrence of acute and transient psychotic disorders (ATPD) in the Qatari population (N= 724,125; nationals constituting about 30% of the general population) and attempted to ascertain significant socio-demographic characteristics among those diagnosed with ATPD (based on ICD-10). Medical records for all inpatients and/or out-patients (Qatari, non-Qatari Arabs and expatriate) that were diagnosed with a psychotic disorder from 01 August 1996 – 01 January 2004, and sought treatment at the Department of Psychiatry of the Rumaillah Hospital were included in the study. During the observed period, 174 patients were diagnosed with ATPD (1.4% of all psychiatric patients treated during this period). Of those diagnosed with an ATPD, the most common type of ATPDs was acute schizophrenia-like psychotic disorder (35.6%), most of whom affected were males (74.2%) and in the age group 16-29 (56.5%). The second and third most common types of ATPDs were acute polymorphic psychotic disorder without symptoms of schizophrenia (23%), and acute polymorphic psychotic disorders with symptoms of schizophrenia (20.7%), respectively.

### **Gender differences**

In the Al Ain Community Psychiatric Survey I<sup>10</sup>, unlike other ICD-10 psychiatric disorders, lifetime prevalence of schizophrenia and related disorders showed no gender differences at all (0.7% for women, 0.7% for men, with 95% CI [0.2-1.2]).

In the Qatari hospital based study, Shaltout et al.<sup>16</sup> found that of 174 individuals that were diagnosed with an acute and transient psychotic disorder over a 7- year period, 69% were males (P<0.001).

### **Comorbidity**

Moussaoui et al.<sup>17</sup> conducted a study on the comorbidity between schizophrenia, depression and suicidality, using a sample of 183 patients with a schizophrenic disorder (ICD-10 criteria). The sample's mean age was 34.3 +/- 8 years with 90% of the patients being males. The authors found a prevalence of 44.3% of depressive symptoms that did not, however, warrant a diagnosis of major depressive disorder. While 2.7% of the sample reported suicidal ideas (40% of whom had a depression or had what the authors called "a painful consciousness of their illness", that is, the patients' awareness of their illness instilled sadness in them), 5% of the sample had a specific plan to implement them. The authors also reported substance abuse in 34% of their sample, cannabis being the most highly abused substance.

A few studies were actually found that tackled comorbidity of schizophrenia and substance abuse. A study was conducted in Lebanon by Karam et al.<sup>18</sup>, who examined comorbidity of substance abuse with other psychiatric disorders (among which schizophrenia). The sample consisted of 222 inpatients admitted to the St Georges Hospital University Medical Center Psychiatry Unit in Beirut from 1979 to 1992 for substance abuse with or without other Axis I psychiatric disorders. The sample's mean age was 34.5 +/- 11.8 years. The comorbidity rate of Axis I psychiatric disorders in patients with substance abuse were found to be 64.9%, using the DSM-III-R diagnostic criteria. As for schizophrenia and schizoaffective illness, substance abuse was found to be 12.5%. Patients with schizophrenia were characterized by the highest prevalence rate of cannabis abuse (44.8%). Twenty seven point eight percent were found to have abused cocaine and 11.1% heroin. Licit substances were generally less abused, with a 5.6% prevalence of abuse of both stimulants and medicinal opiate derivatives, but none of tranquilizers or barbiturates. Alcohol had been found to be almost equally abused among different diagnostic categories, with 44.4% of schizophrenic patients abusing it. The authors attribute this high rate of alcohol abuse to the availability and the easy accessibility of alcohol in Lebanon. However, a limitation to this study would be the religious background of the patients in extrapolating the alcohol abuse rates on a national level. Another possible limitation concerns the reliability of the clinical diagnoses made, given that these were not based on structured interviews, and thus

they may lack uniformity because of changes in diagnostic criteria over the studied period. The authors note, however, that since the Lebanon Wars were at their peak during most of the study period, licit and illicit substances were easily accessible in the Lebanese market and would have provided a possible relief from the pain and suffering accompanying psychiatric illness that increased during the Lebanon Wars. The authors finally add that variability in prevalence rates of comorbidity of psychiatric and substance abuse disorders can be due to differences in perspective of the researcher (comorbidity of substance abuse in psychiatric sample or comorbidity of psychiatric disorders in a substance abusing population), methodology or population studied.

Another study was conducted in Egypt by Asaad et al.<sup>19</sup> who also examined comorbidity of schizophrenia and substance abuse, using the DSM-IV diagnostic criteria. The sample consisted of 100 randomly selected schizophrenic patients who were attending the outpatient clinic at Ain Shams University Psychiatric Institute during 2001. Patients were assessed using the Structured Clinical Interview for DSM-III-R Mental Disorders I, II (SCID-I, SCID-II), Beck Depression Inventory (BDI) and the Positive and Negative Syndrome Scale. The comorbidity rate of substance abuse in these patients was found to be 26% (n=26) with the comorbid group having a mean age of 30.59 +/- 7.15 years. Male gender, associated premorbid personality disorder, high depressive symptomatology and cigarette smoking were all risk factors found to be significantly associated with substance abuse in patients with schizophrenia. Indeed, 92.3% (n=24) of the comorbid group versus 54.1% (n=40) of the non-comorbid group were males ( $p < 0.001$ ). Furthermore, 65.4% (n=17) of the comorbid group versus 39.2% (n=29) of the non comorbid group had an associated personality disorder ( $p < 0.05$  and  $\chi^2 = 5.3$ ). Moreover, 61.5% (n=16) of the comorbid group suffered from an associated depression while 32.4% (n=24) in the non comorbid group did ( $p < 0.01$  and  $\chi^2 = 6.79$ ). Finally, 100% of the comorbid group engaged in cigarette smoking while 67.6% (n=50) in the non comorbid group did ( $p < 0.001$  and  $\chi^2 = 15.02$ ). The authors note that these risk factors (male gender, high level of depression, premorbid personality disorder, and smoking) are not all restricted to schizophrenics. The authors concluded that comorbidity of substance abuse, schizophrenia, and personality disorder favors the common vulnerability hypothesis, but the association with high levels of depression favors the self-medication hypothesis. As for the types of substances abused, anti-parkinsonians topped the list (38.5%), followed by cannabinoids, opioids, and benzodiazepines (11.5% for each). Polydrug abuse (anti-parkinsonians, cough syrups, glue, benzodiazepines) was found in 19.2% of patients. The authors explain the high prevalence of anti-parkinsonians abuse with the possible availability and acquaintance with these drugs, which could be in accordance with the "self-medication hypothesis". The

absence of cocaine abuse is inconsistent with the findings of both of the previous study from Lebanon and what is published in the literature from western countries, possibly because of the cost of cocaine in Egypt. As for alcohol, it was abused by 7.7% (n=2) of patients, again a much lower prevalence rate than that found in Lebanon and Western studies (possibly attributable to socio-religious reasons). It is important to note that no significant association was found between substance abuse in schizophrenic patients neither with type of schizophrenia, nor with nature of symptoms or the treatment prescribed. When asked for the reasons behind their substance abuse, 38.5% of the patients were divided equally in giving the following answers: better sociability, influence of others, pleasure, curiosity, or unable to give a possible reason. Additionally, 30.8% of the patients were engaged in substance abuse for more relief of psychotic symptoms (hallucinations, delusions, etc.), 19.2% mentioned more relief of depressive feelings (i.e. better mood), and 11.5% more relief of drug treatment side effects.

### **Burden**

Awadalla et al.<sup>20</sup> assessed the subjective quality of life (QOL) of a fairly large sample (N=150) of community living and mentally stable Sudanese psychiatric patients suffering from schizophrenia, major affective disorders and mild/moderate mental disorders (referred to as neuroses by the authors) (ICD-10). The patients were recruited from multiple locations representative of the mental health service clinics of Sudan. QOL was measured using the WHO 26-item Quality of Life instrument (WHO QOL-Bref). The patients' own ratings of their QOL were compared with those of a general population sample (N=211, 57.8% men and 42.2% women with a mean age of 30.2) and with the family caregivers' impressions of the patients (N=150, 50% men and 50% women with a mean age of 42.7). Patients with schizophrenia (N=99) were found to be significantly less satisfied than patients with affective disorders and neuroses, and the general population sample on items pertaining to having a meaningful life, energy for everyday life, bodily appearance, money for needs, ability to get around, work capacity, self-satisfaction, personal relationships and support from friends. On average, patients with schizophrenia tended to score significantly lower than patients with major affective disorders and neurosis, even after controlling for age, education, occupation and marital status. As for schizophrenic patients suffering from treatment side effects such as tardive dyskinesia, extra-pyramidal reactions and sexual dysfunction, they did not report significantly lower QOL than patients without treatment side effects.

### **Burden of stigma and discrimination**

Kadri et al.<sup>21</sup> carried out a study in Morocco with the World Psychiatric Association (WPA) program against stigma and discrimination of people with schizophrenia. One of the study's objectives was to measure family members' attitudes towards schizophrenic patients, using a structured

questionnaire. The sample, made up of 100 family members, each accompanying and representing a schizophrenic patient, was drawn from Ibn Rushd University Psychiatric Center of Casablanca, Berrechid Hospital, and two outpatient clinics in Casablanca. Family members' mean age was 47.4 yrs (SD 10.52) and their group was predominantly female (69%), made up primarily of mothers (50%). About a third were without education and about three quarters had no professional activity. Patients, on the other hand, had a mean age of 30.4 years (SD 10.52), were predominantly male, single, and had no professional activity, with duration of illness ranging from 10 months to 30 years. The authors surveyed the family members to explore their attitudes towards the patient. They found that 63.9% did not give the patient difficult or important tasks; 34% justified this by admitting to feelings of distrust and 14% by admitting to the belief that the patient is handicapped. In general, 14% of family members reported treating the patient with distrust, 8% as if the patient were "mad", 59% with overprotection, and 15% with rejection and aggressiveness. Still, 37% thought they treated the patient just like other family members.

In 1978, Younis<sup>22</sup> led a study in Sudan to explore the attitudes of both rural and urban people towards mental illness in general, including schizophrenia. It was a psychiatric sample of 183 adult patients and their companions who came on the date of the survey to the health centers of two urban and two rural areas in Northern Sudan. The sample was predominantly Muslim, Arabic-speaking males and females ranging in age from 18 to 60 years, with a mean age of 33.5 years. The instrument used was the Arabic translation of the Malhotra and Wig<sup>23</sup> standardized vignettes. An estimated one quarter of urban and rural participants replied through self-reports that they would accept a person with schizophrenia as a neighbor prior to treatment (26.5% vs. 22.35% respectively). However, the level of acceptance increased significantly after treatment, exceeding 50% (52.04% for the urban sample versus 54.11% for the rural sample). Interestingly, there was significantly more acceptance for the schizophrenic patient living in the community than for the alcoholic. The author acknowledged that the study was limited in terms of external validity, for although four fifths of the Sudanese population lived in northern Sudan, the use of the chosen health centers may not have been uniform across this population. Although there might have been a positive self-presentation bias, which was not controlled for, nevertheless, the study offered a useful glimpse into the much needed research in this realm.

### **Family burden**

In their study about schizophrenia, depression and suicidality, Moussaoui et al.<sup>17</sup> reported that in 19.8% of the cases, the patients' families were practically unaware of their illness. But in 67.7% of the cases, family members had been subjected to verbal or physical violence, especially while patients exhibited active psychotic symptoms. Statistical analysis

revealed that aggressive patients had a significantly higher frequency of depressive symptoms and suicidal behavior. The main risk factors for violence were found to be anxiety and hallucinations, particularly auditory ones.

In the previously mentioned study by Kadri et al.<sup>21</sup>, Moroccan families of patients with schizophrenia were found to suffer from stigma and discrimination. 86.7% of them reporting hard lives attributed to the illness itself, and 72% reporting psychological suffering such as poor quality of life; 2% of the subjects were expelled from rental accommodation, 29% felt people were afraid of them, 15% reported experiencing distrust of others, 29% mockery, 41% maltreatment, and finally 34% report experiencing neglect, especially from neighbors and relatives, who were actually perceived as the most stigmatizing group. Furthermore, the illness was also perceived as causing relationship disturbances within the family: 7% are divorced, 6% of fathers left the family, leaving the mothers as the only caregivers. It is important to note that the authors did not compare these figures with those found in the general population (e.g. by using a control group) which limited the scope of interpretations with regard to the extent of stigmatization related to schizophrenia.

In a different study using the same sample of Sudanese patients (see above), Awadalla et al.<sup>24</sup> administered the WHO QOL-Bref to the patients' family caregivers to compare their subjective quality of life (QOL) to that of the general population. The sample of family caregivers consisted of 98 caregivers for schizophrenia, 117 caregivers for major affective disorders and 78 caregivers for neuroses, all compared to a general population sample of 189 individuals. The caregivers of schizophrenia patients tended to score lower than other caregivers on the QOL domain scores, but this difference did not reach significance ( $p > 0.05$ ). For example, there were no significant differences in scores between caregivers of affective disorders and neuroses patients on one hand, and caregivers of schizophrenia on the other hand ( $P > 0.05$ ). Interestingly, the sole significant predictor of caregivers' QOL was the caregiver's own estimation of the patients' QOL and their own health status. The most surprising finding was that the schizophrenia caregivers' scores were comparable to those of the general population group for four out of the six domains of QOL, with the caregivers reporting significantly higher QOL on the physical and spiritual domains ( $P = 0.001$ ). These results were sustained even after controlling for sociodemographic variables. These findings were particularly unexpected in light of the previous literature, which shows that caregivers generally have lower scores on QOL than control groups<sup>25,27</sup>. The authors noted, however, that none of the previous studies involved caregivers of patients with a wide range of psychiatric disorders or stable patients. Thus, they concluded that the expectation that caregivers of mental health disorders would have lower scores on QOL still requires adequate testing. The authors claimed they could only explain the relatively

high QOL scores of the caregivers, but not why these scores were higher than those of control groups. They suggested that the factors driving up these QOL scores might be the caregivers' high rating of the patients' state, the family stability and the extended social support network that is available to them. The authors also added that hardiness and salutogenesis may have played a particularly important role in driving the scores upwards, as these principles are widely spread in Sudan's Islamic culture. Anyhow, the authors considered the findings as giving reason to be more optimistic about mental disorders' effect on family burden, particularly schizophrenia.

### ***Burden of criminality***

What may somehow provide as a basis for the stigma and discrimination directed against people with psychosis is the association of the illness with criminality, though this picture is frequently inflated in the mind of the public. For example, Moussaoui et al.<sup>17</sup> found that approximately 22% of their 183 schizophrenic patients in Morocco had prior dealings with the police or the judicial system.

Touari et al.<sup>28</sup> conducted a study on the association between criminality and psychosis in Eastern Algeria, based on 3662 male consultations made between Jan 1<sup>st</sup> 1963 and Dec 31<sup>st</sup> 1986, at the Psychiatric Clinic of the University Hospital of Constantine. In Algeria, psychiatric consultations are mandatory in criminal cases, but optional in cases of misdemeanor. The sample, though exclusively male, was reported to be representative of the larger criminal population. The authors examined the frequency of psychosis (vs. other psychiatric disorders) in perpetrators of different types of crimes or misdemeanors. The sample had a mean age of 30.1 +/- 11.3 years, and was made up of 3662 subjects, of whom 70.1% (n=2567) had committed crimes, while 29.9% (n=1095) had committed misdemeanors. The prevalence of psychosis in the criminal population was found to be 11.1% (n=284), assessed according to the Classification Française des Troubles Mentaux diagnostic criteria. Psychosis was found to be more frequent, however, in cases of misdemeanors where 18.6% (n=204) were psychotics (p<0.001). The diagnosis of schizophrenia and acute schizophrenic episodes was also greater in cases of misdemeanors than in crimes (72.5% in the former versus 59.5% in the latter, p<0.01). There were no significant differences between the crime and misdemeanor groups neither in the diagnosis of paranoia or chronic hallucinatory psychosis (39.1% in the crime group versus 25.5% in the misdemeanor group), nor in the diagnosis of manic depression (bipolar illness), which was rare (1.4% versus 2%, respectively). The presence of previous psychiatric history was twice as frequent in cases of misdemeanors (where psychiatric consultations are optional) as in crimes (29.9% vs. 13.4%, respectively, p<0.001). A strong association was found between the type of crime committed and the psychiatric diagnosis (p<0.0001). Psychosis was more prevalent among homicides and aggravated assaults than among other

types of crime. 19.9% of homicides and attempted homicides (18.4% of homicides and 25.6% of attempted homicides) and 32.7% of aggravated assaults were committed by psychotics whereas only 3.2% of sexual crimes and 1.3% of robberies were. Psychosis was more prevalent in acts of violence (33.1%) than in other types of misdemeanors, and was significantly less prevalent in infraction against property (4.1%, p<0.0001).

The authors investigated the relationship between those who committed or attempted homicides and their victims and found that the latter were more frequently direct ascendants (father, mother) or spouses and less frequently people who were known but who were not family members. When there was any sort of relationship between the offender and the victim (familial or non-familial), subjects with schizophrenia and acute schizophrenic episode committed or attempted homicide more frequently against a parent, whereas subjects with paranoia or chronic hallucinatory psychosis committed or attempted homicide more frequently against a spouse.

A Kuwaiti study was conducted by Fido et al.<sup>29</sup> on 69 men and women prisoners specifically referred for psychiatric assessment over a nine month period: 36.2% had a major psychiatric disorder. Patients with schizophrenia accompanied with active symptoms appeared to be more likely to commit violent offenses. Nine out of ten prisoners who had been referred for psychiatric assessment and who had committed murder were found to suffer from schizophrenia. The authors reported that almost all the patients with psychotic disorders had active symptoms at the time they committed their offenses, and the most likely reason behind their crimes was psychosis.

### ***Burden of untreated psychosis***

Moussaoui et al.<sup>17</sup> assessed the duration of untreated psychosis in 183 schizophrenic patients in Morocco to be 275 ± 2.66 days. According to the authors, this can partially be explained by the fact that the illness was progressive and insidious for 70% of the patients.

El Hamaoui et al.<sup>30</sup> examined the duration of untreated psychosis (DUP) and its predicting factors in a sample of 400 out-patients with schizophrenia, according to DSM IV criteria (male gender: 77.5%, mean age: 36 years). The recruitment was done in the Ibn Rushd University Psychiatric Center in Casablanca, Morocco. DUP was defined as the interval between the onset of the first positive symptom and the start of an adequate treatment. Among the 400 patients, 68% were jobless, and 43.8% had family psychiatric history of which schizophrenia represented 75.5%. The mean DUP was 148.7 weeks. Fifty two point eight percent had an antecedent of psychiatric admission with a mean duration of hospitalization of 51.7 days. The mean number of psychotic episodes was 4.3 ± 3.3. Several factors were found to be strongly related to DUP. Female gender represented the first factor. In this regard, DUP was 135 weeks in men with schizophrenia

versus 195.3 in women. The age was positively correlated with DUP ( $p < 0.001$ ). When the patient was single DUP was 120.3 weeks, but it reached 201.3 weeks in the married group ( $p < 0.001$ ). Moreover, in patients born in rural areas, DUP was 333.4 weeks versus 130.4 weeks in urban ones ( $p < 0.001$ ). DUP was also negatively correlated to level of schooling. In the illiterate group, DUP was 449.2 weeks versus 95 weeks in the literate group ( $p < 0.001$ ). Finally, the increase of DUP was correlated to prolonged duration of hospitalization ( $p < 0.001$ ) and a high number of psychotic episodes ( $p = 0.004$ ).

In the Qatari hospital based study, Shaltout et al.<sup>16</sup> observed that 43.7 % made only one hospital visit, 40.8% visited 2-10 times, 7.5% visited 11-20 times, and 8% visited more than 20 times ( $P < 0.001$ ). The most frequent types of visits were outpatient visits (60.3%), followed by those who made both in-patient and outpatient visits (24.7%), and those who only used inpatient services (14.9%) ( $P < 0.001$ ).

### **Fertility**

In light of previous literature about persons with reduced reproductivity compared to the general population<sup>31,32</sup>, Daradkeh et al.<sup>33</sup> and Abdel-Latif<sup>34</sup> sought to compare the fertility rates between schizophrenic and non-schizophrenic psychiatric patients in the United Arab Emirates and Egypt respectively.

The UAE sample<sup>33</sup> was made up of 248 patients (113 males and 135 females) who were consecutively admitted patients to the Al Ain inpatient unit. They had all been married before and also had ICD-10 diagnoses of either F1 (mental and behavioral disorders due to psychoactive substance-abuse), F2 (schizophrenia and related disorders), F3 (mood disorders) or F4 (neurotic, stress related and adjustment disorders). No significant differences in fertility rates were found between patients with schizophrenia and related disorders (2.80 children/patient with  $n=64$ ) and non-schizophrenic patients. Naturally, however, this does not imply that schizophrenic patients do not have reduced fertility rates compared to the general population. Divorce rates of schizophrenic patients in this study were lower than expected (6.4% for males and 12.8% for females), which may partly account for non-significant differences in fertility rates between schizophrenic patients and non-schizophrenic ones.

In the second study<sup>34</sup>, recruitment was conducted in the psychiatric inpatient unit in Zagazig University Hospital in Egypt. Five hundred twenty patients diagnosed with schizophrenia ( $n=180$ ), mood disorders ( $n=110$ ) or neurotic illness ( $n=230$ ), according to ICD-10 criteria, participated in this study. Married men in the group with schizophrenia produced more children than married women, which is in favor of an increased fertility in men with schizophrenia despite the decreased marital rate.

### **Burden of death-related issues**

Abdel-Khalek<sup>35</sup> compared death anxiety scores between 7 groups ( $N = 765$ ) of Egyptian participants (non-clinical, anxiety disorder patients, patients suffering from schizophrenia, and male addicts), with mean age of each group around 32 years. Female schizophrenic patients obtained the next highest mean score on the Arabic Scale of Death Anxiety (ASDA) after anxiety patients. Moreover, they reached significantly higher mean scores on the ASDA than their male counterparts. Surprisingly, male schizophrenic patients had the lowest ASDA score compared to all other groups, including the non-clinical group ( $p < 0.001$ ). This contrasts with the clinical literature, which finds that schizophrenic patients are generally burdened by death related issues. The author considers this result, however, as specific to the male sample of schizophrenic patients in this study.

## **Discussion**

As evidenced by our review, epidemiological studies on schizophrenia and related disorders in the Arab world are rare. The current review serves to update clinicians and researchers in the Arab world and other international counterparts alike since the core symptomatology of schizophrenia seem to be similar across cultures<sup>36</sup>. Data on the prevalence of psychotic disorders reported by Arab countries varied between 0.7% and 5.6% depending on the period assessed for prevalence. Studies on gender differences conducted in the UAE found no differences while that of Qatar reported that more males had acute and transient psychotic disorders than females. This range of prevalence should be interpreted with caution, keeping in mind the various diagnostic systems (e.g. ICD-10, DSM-III-R, MINI, etc) that were used. In a meta-analysis from a systematic review of 188 studies across the world, the authors reported a 4.6/1000 median point prevalence of schizophrenia<sup>37</sup>.

The comorbidity of schizophrenia (and related disorders) and substance abuse was investigated in Morocco, Lebanon and Egypt. In patients with schizophrenia, substance abuse ranged from 6.2% to 34%. In patients with substance abuse, schizophrenia and schizoaffective illness was found to affect 12.5%. Cannabis consistently topped the list of abused substances. Alcohol on the other hand was reported by schizophrenic patients in Lebanon and Egypt. The comorbidity of schizophrenia and depression was documented in studies conducted in Morocco and Egypt, although this was not the main focus of these studies.

There were notable efforts to gather data on the quality of life of schizophrenic patients. Patients with schizophrenia were found to have lower quality of life than their relatives/caregivers. The latter are more similar to the general population or patients with other psychiatric disorders. Others found commonality of criminal behaviors among schizophrenic patients.

Several studies have shown that the mean DUP ranged from 1 to 2 years<sup>38</sup>. The mean duration of untreated psychosis was recorded in two different studies in Morocco: 275 days and 148.7 weeks. The latter figure was clearly above what has been reported in North American and European studies. This increase in DUP in Moroccan patients could be due to cultural beliefs and intensity of stigma phenomena.

In sum, the current review showed that available data are highly fragmented across time, space and topics of interest. Additionally, they are limited in many ways with important methodological heterogeneity. For instance, one of the four epidemiological studies found to assess prevalence of schizophrenia and related disorders<sup>10</sup> and one of two studies found to assess incidence<sup>13</sup> of schizophrenia and related disorders used the Composite International Diagnostic Interview (CIDI)<sup>11,12</sup> as an instrument. However, since the questions screening for non-affective psychosis in this version of the CIDI were worded in a way that increased the false-positive responses<sup>39</sup>, the validity of the prevalence rates from these two studies on psychotic disorders was put into question and would need clinical validation. In the study by Daradkeh et al.<sup>13</sup>, the difference in assessment tools (CIDI at baseline and SCID at follow-up) affected the reliability of the diagnoses and thus the validity of the study since according to the authors the few studies that assess the level of agreement between both tools do not show a very good agreement coefficient. Moreover, the reliability of the findings and their generalizability were sometimes limited by the small sample size. Furthermore, the instruments used were not always culturally validated and it has been difficult to compare findings across the studies due to differences in methodologies used<sup>12,19</sup>. All of these combined factors limited us from drawing an integrated or coherent picture of the current state of affairs regarding schizophrenia and related disorders in the Arab world, thus limiting the utility and generalizability of the aforementioned studies.

Research activity is highly restricted to specific research teams operating in some countries, rather than being the product of national concerted efforts at gathering epidemiological mental health data. There is an unmet need for national studies with collaborative efforts for similar methodologies which allow for cross-cultural comparisons. Research on psychotic disorders in the Arab world is thus extremely insufficient. It could, of course, be argued that there are many more studies in the Arab world, but these were not published in international journals; instead, they were published in non-indexed local journals or sometimes only presented at international congresses. However, any review should ultimately focus on published studies as the publication process guarantees the generation of more reliable and useful data.

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### المخلص

إن البحوث حول الصحة النفسية في العالم العربي في ازدياد على مدى السنوات الـ 40 الماضية. وقد نشرت مراجعات بحثية منهجية عن عدة مواضيع من هذه المنطقة مثل الانتحار وتعاطي المخدرات، واضطرابات القلق واضطراب نقص الانتباه وكثرة الحركة لتوفير المعلومات اللازمة للأطباء والباحثين والطلاب على حد سواء حول تلك المواضيع. إن الغرض من هذه الورقة هو تقديم عرض منهجي حول الدراسات الميدانية حول أمراض الذهان التي تم نشرها في العالم العربي حتى نهاية العام 2007، وتم لهذا الغرض استخدام عدد من آليات البحث، PubMed و PscINFO وقاعدة بيانات IDRAAC على شبكة الإنترنت.

على الرغم من أن الدراسات حول أمراض الذهان في العالم العربي نادرة فإنها بالرغم من ذلك قد تناولت مجموعة متنوعة من المواضيع. وفقاً للدراسات التي تم تحديدها تراوحت نسبة انتشار الاضطرابات الذهانية بين 0.7% و 5.6% دون وجود فروقات تميز بين الجنسين. ناقش العديد من الدراسات التزامن بين هذه الاضطرابات وتعاطي المخدرات أو الاكتئاب، و / أو العبء المتعلق بها (وصمة العار والتمييز، العبء على الأسرة، النشاط الإجرامي، قلة الخصوبة والعلاج والموت). هناك حاجة ماسة إلى دراسات وطنية بشأن أمراض الذهان في هذه المنطقة من العالم لتحديد حجم المشكلة، وبناء على ذلك تحديد الاتجاهات المستقبلية.

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