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Yekeen A. Aderibigbe · S. K. Adityanjee

Psychiatric epidemiology in cross-cultural perspective: a review

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Abstract Advances in psychiatric research have reestablished the importance of psychiatric community epidemiological studies. Psychiatric epidemiological surveys that used the same standardized diagnostic interview and classification system in different parts of the world were reviewed. The lifetime prevalence for any psychiatric morbidity ranged from 21 to 65%. The prevalence of psychiatric disorders was higher than that in the first- and second-generation community surveys. The relevance of these findings to clinical practice, public health, and the directions for future epidemiological research are discussed.

Key words Epidemiology · DIS · Cross-cultural

Introduction

Epidemiology is the study of the distribution of diseases in populations and the factors that influence that distribution (Lilienfeld 1957). The knowledge of disease distribution and associated factors generates hypotheses to causal processes and also suggests a need for services such as prevention, intervention, and rehabilitation.

Cross-cultural comparison of prevalence or incidence rates is frequently used to determine the role of environmental influences in the causation of disorders (Helzer and Robins 1988). When differences in rates are found between regional or cultural groups, characteristics relevant to the disorder in question that are common in the high-rate cohorts are tested to see whether they are associated with presence of the disorder within that particular culture; if thus proven, they are considered as putative etiologcial factors. The main aim of this review was to compare community psychiatric epidemiological studies (that utilized similar research design, diagnostic interview, and classification, namely DIS and DSM-III, respectively) across diverse cultures and regions. Specifically, this review aimed to (a) determine the lifetime prevalence of DSM-III disorders across different regions and cultures, and (b) to also determine the major demographic correlates of DSM-III disorders.

Yekeen A. Aderibigbe (✉) · S. K. Adityanjee
Department of Psychiatry, Medical College of Virginia, Box 710, MCV Station, Richmond, VA 23298-710 USA

Historical perspective

There is a long history of psychiatric epidemiology in many parts of the world. Carlsen (1891) published statistical investigations concerning mentally retarded patients in Denmark between 1888 and 1889. The first reported attempt of psychiatric epidemiology in North America was by Dr. Eward Jarvis in 1855 (Jarvis 1855), who reported on the prevalence of insanity and idiocy in Massachusetts. A few other early psychiatric epidemiological studies include Durkheim's 19th century work on suicide (1951), studies by Stromgren (1950), Mayer-Gross (1948), Lemkau et al. (1941), Srole et al. (1962), Essen-Moller (1956), and Helgason (1964). These studies had a variety of purposes, but all attempted to estimate rates of psychiatric disorders in different population groups. These early studies also utilized different methodologies and interview instruments, thus, they do not provide a robust base for cross-cultural comparisons.

Psychiatric morbidity and mortality across cultures received epidemiological attention beginning approximately half a century ago (Odegaard 1932). The first cross-cultural community psychiatric epidemiological survey was published by Lin in 1953. Since then the stimulus for cross-cultural psychiatric epidemiology has intensified. Leighton and colleagues (1963) conducted a cross-cultural comparative, community survey of psychological problems between a settlement in Pacific Canada and settlements in southwestern Nigeria. The World Health Organization (WHO) has organized several cross-cultural epidemiological studies on severe mental disorders and psychological problems in general health care, e.g., the International Pilot Study on Schizophrenia (IPSS; WHO 1973; WHO 1979; Leff et al. 1992) and the project on the Determi-

nants of Outcome of Severe Mental Disorders (DOSMD; Jablensky et al. 1992). The IPSS was carried out in nine countries, involving more than 1200 patients.

What is a "psychiatric case?"

The definition of what constitutes a "psychiatric case" has shown great variability in the literature. No single set of definitions is likely to be of universal validity (Wing and Sturt 1978). The World Health Organization (WHO) gave an operational definition of a "case" as "a manifest disturbance of mental functioning, specific enough in clinical character to be consistently recognizable as conforming to a clearly defined standard pattern and severe enough to cause at least partial work loss or social incapacity or both" (WHO 1960).

Epidemiological research is dependent on the accuracy of diagnostic methods. The technical difficulties of psychiatric epidemiological studies have been amply detailed by Dohrenwend and Dohrenwend (1974), whereas the need and the processes for improvement in case identification and standardized diagnoses has been emphasized by Kramer (1976). Lack of a reliable and valid method for making standardized psychiatric diagnoses has held up progress for many years. The initial attempts to understand and rectify the doubt on the reliability of psychiatric diagnosis involved two major research studies: the United States-United Kingdom diagnostic project (Cooper et al. 1972) and the IPSS (WHO 1973). The projects utilized the Present State Examination (PSE) developed by Wing et al. (1974) to investigate the difference in reported rates of depression and schizophrenia between the U. S. and the U. K. The apparent excess of schizophrenia in the U. S turned out not to be true epidemiological finding, but a result of differences in the diagnostic practice. This study and the IPSS (WHO 1973), which also utilized the same standardized instrument, the PSE (Wing et al. 1974), demonstrated that by using standardized interviews it was possible to train psychiatrists in different countries to make reliable diagnoses. Following the success of the U. S.-U. K. diagnostic study, in 1975, the U. S. National Institute of Mental Health (NIMH) supported a collaborative study on depression, out of which came the Schedule for Affective Disorders (SADS) (Spitzer and Endicott 1975) and the Research Diagnostic Criteria (RDC, Spitzer et al. 1978).

In the past three decades, international efforts have increased to develop a "common language" for worldwide use by psychiatrists and other mental health professionals. Various standardized/structured interview schedules and diagnostic systems have been developed.

Advances in mental health technology

Present State Examination

The Present State Examination (PSE; Wing et al. 1974) is a semistructured interview schedule. Its administration requires specially trained clinicians: thus, its international use was for many years limited to clinical settings. Recently, efforts have been made to train nurses and lay interviewers in its use (Bebbington et al. 1981; Stuart et al. 1981; Rodgers and Mann 1986). However, this new development regarding its usage by trained nonclinicians seems to have been limited to Britain (Helzer and Robins 1988). There is a screening version of PSE available for psychiatric community surveys.

Diagnostic Interview Schedule

The Diagnostic Interview Schedule (DIS; Robins et al. 1982) was developed for use in community epidemiological surveys and for the systematic collection of information capable of being scored by computer algorithms according to DSM-III (American Psychiatric Association 1980), RDC (Spitzer et al. 1978), and Feighner Criteria (Feighner et al. 1972). It is a standardized, fully structured interview that can be used by lay interviewers, thus enabling an adequately large sample to be studied without resorting to screening instruments. The DIS attempts to mimic a hypothetical diagnostician's subjective decisions in identifying a disorder. Diagnoses are made by computer algorithms whereby the DIS responses are linked to DSM-III diagnostic criteria.

The DIS was used by the U. S. NIMH to conduct the Epidemiologic Catchment Area (ECA) project. This was a large-scale community survey of mental disorders in five states (involving 12 catchment areas). Full description of the purposes and methods of the ECA project has been given elsewhere (Regier et al. 1984; Eaton et al. 1985; Eaton and Kessler 1985). The number of diagnostic categories covered in the ECA project was more comprehensive than in previously conducted cross-cultural epidemiologic studies (WHO 1973; Sartorious 1989; Leff et al. 1992). The inclusion of alcoholism and drug addiction in the ECA was commendable, because in most of the previous community studies of psychiatric disorders, information about the intake of alcohol was not sought (Bebbington et al. 1981; Weissman et al. 1986).

The DIS has served as the core upon which newer diagnostic interview schedules have been developed, e.g., the Composite International Diagnostic Interview (CIDI; WHO 1990). Other new instruments include the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; WHO 1992) and the International Personality Disorder Examination (IPDE; WHO 1992). We are still in the early stage of the utilization of these new instruments in community and cross-cultural psychiatric epidemiological surveys. The ECA study was succeded by the National Comorbidity Survey (NCS). The survey was about the comorbidity of psychoactive substance-related disorders and non-psychoactive substance-related psychiatric disorders in the U. S.. A total of 8098 subjects participated in the NCS, which was conducted between 1990 and 1992. The NCS showed some advantages over the ECA study, which included: the use of a modified form of CIDI (WHO 1990)

Table 1 Lifetime prevalence studies of DIS/DSM-III disorders

Authors	Location	*N*	Overall lifetime time prevalence (%)
Bland et al. (1988)	Edmonton, Canada	3258	33.80
Wittchen et al. (1992)	Munich, Germany	483	32.06
Chen et al. (1993)	Shatin, Hong Kong	7229	38.90 (Male) 19.30 (Female)
Stefansson et al. (1991)	Iceland	862	65.10
Lee et al. (1990)	Seoul, Korea	3134	39.80
Wells et al. (1989)	Christchurch, New Zealand	1498	37.00
Canino et al. (1987)	Puerto Rico	1513	28.10
Hwu et al. (1989)	Taipei, Taiwan	5005 (Metropolitan)	21.70
		3004 (Small towns)	34.90
		2995 (Rural villages)	30.40
Robins and Reiger (1991) United States ECA study (n = 19640); overall prevalence of any disorder = 32%	Baltimore	3586	41.00
	Durham	4123	35.00
	Los Angeles	3503	33.00
	St. Louis	3327	31.00
	New Haven	5101	28.00

that allows for diagnoses to be made according to DSM-III-R (American Psychiatric Association 1987), DSM-IV (American Psychiatric Association 1994), and ICD-10 (WHO 1992); inclusion of assessments of parental psychopathology, questions about childhood family adversity, measures of social networks and support, information about stressful life events and difficulties (Kessler et al. 1994).

Whereas other standardized interview schedules have been used for individual investigations, the DIS has been employed in the largest number of studies and has the highest cumulative sample size at any time or place in psychiatric epidemiology to date. There were approximately 20000 subjects in the ECA study. The DIS has enjoyed a broad global utility and applications within diverse culture (Maser et al. 1991). There are approximately 24 standardized translations of the DIS (Robins 1990), which include Spanish, Chinese, Cantonese, Vietnamese, Japanese, and Korean translations. Other standardized translations include German, Greek, French, Portuguese, Icelandic, Serbo-Croatian, Swedish, and Dutch. The psychometric properties of this instrument regarding the various languages and cultures where it has been used have been documented (Eaton et al. 1985; Helzer et al. 1984; Anthony et al. 1985; Karno et al. 1983; Hwu et al. 1989).

The widespread use of DIS allows for comparability of data across diverse regions at different times. In this article we intend to compare the lifetime prevalence of DIS/DSM-III disorders across the world. Cross-cultural psychiatric epidemiological surveys, among other things, would help to establish similarities and differences in prevalence rates and other etiological/associated factors among patients with different social, cultural, economic, and geographical characteristics.

Materials and methods

We reviewed all the availabe community psychiatric epidemiological studies that utilized DIS/DSM III criteria. A MEDLINE search and previous review papers (Westermeyer 1989; Dohrenwend 1990; Robins 1990) were used to locate relevant lifetime prevalence studies published up to June 1994. Only articles published in English (or those with a detailed summary in English) were reviewed. Studies were excluded if they did not involve a broad community sample or give lifetime prevalence rates of psychiatric disorders. A study had to consider more than one diagnostic category before it was included.

The lifetime prevalence of a disorder refers to the proportion of individuals in a representative sample of a population who have ever experienced that disorder. This measure has been called the proportion of survivors affected. Lifetime diagnosis identifies a large number of affected cases than does point or period prevalence or annual incidence. It is less affected by duration of the disorder than is point or period prevalence (because point and period prevalence count only disorders present on a single day within a specified time period). Long-lasting disorders are more likely to be counted than short disorders, because they are present on more days in the individuals life (Robins et al. 1984).

Possible problems with the use of lifetime prevalence include differential mortality rates, the effect of which could be a false impression that lifetime rates for a disorder may be increasing in the young. If the disorder has a high mortality rate, affected persons may simply have been removed from the older population, thus producing lower lifetime rates for the disorder. Lifetime prevalence obtained by retrospective methods is also vulnerable to retrospective falsification of symptoms by respondents because of memory problems. In studying the reliability of the DIS in eliciting lifetime psychotic symptoms in clinical cohorts, Helzer and

Robins (1984) concluded that the rate of recall of symptoms was generally satisfactory. Similarly, Wittchen et al. (1989) found satisfactory results using the DIS to assign diagnoses to a group of former psychiatric patients.

Our review covered studies from several countries around the world including Canada, Germany, Hong Kong, Iceland, Korea, New Zealand, Puerto Rico (U. S.), Taiwan, and the mainland U. S.. A total of 13 community lifetime prevalence studies were reviewed (Table 1). The combined results of the ECA projects from all the five states in the U. S. have been published (Robins and Regier 1991). There were no reported community psychiatric epidemiological studies conducted with the DIS in Africa, Australia, Britain, and the Middle East.

Results

Response rates

The community psychiatric epidemiological studies that were reviewed for this study are compared in Table 1. The consensus from these studies are considerable. The general response rates of respondents for individual study reviewed is from 70% for the study in Christchurch, New Zealand, to 90% for the study in metropolitan Taipei in Taiwan. The response rate for the study in Edmonton was 71.60%; Munich 73.50%; Shatin, Hong Kong 90%, Iceland 79.30%; Seoul, Korea 82.30%; Puerto Rico 91%; and for all ECA sites combined 75%. The sample size ranged from 483 subjects in Munich, Germany, to a large sample of 7229 in Shatin, Hong Kong, for individual site.

Whereas the number of DSM-III diagnostic categories reported varied for individual study (from a minimum of 17 in Edmonton and Munich to 37 in Iceland), the studies reviewed had comparable survey sampling procedures. The studies generated diagnoses standardized to their respective general population sampling frames. Poststratification procedures were used by each of the studies to weight their respective data to reflect accurately for age, gender and other sociodemographic characteristics of the communities surveyed (Helzer et al. 1984; Holt and Smith 1979).

Total lifetime prevalence rates

Table 1 shows the lifetime prevalence rates for DIS/DSM-III disorders in each country. The overall lifetime prevalence rate ranges from a low value of 22% in metropolitan Taipei to a high value of 65% in Iceland. Aside from the markedly low and high lifetime prevalence rates of 22 and 65%, respectively, the modal lifetime prevalence rate was in the mid-30s. However, caution should be taken in interpreting this measure of general psychopathology (i.e., overall lifetime prevalence), because the prevalence rate for each country may vary according to how many diagnoses (with high or low rate) are put together. Nonetheless, these prevalence rates are comparable. In contrast to the low lifetime prevalence of 22% for metropolitan Taipei, the rates for small towns and rural villages in Taiwan were surprisingly higher, 35 and 30%, respectively. This unique finding deserves further elucidation.

Table 2 Lifetime prevalence rates of specific DIS/DSM-III disorders for both genders in percentage (SE in parentheses)

DSM-III disorder	Bland et al. (1988b; Edmonton, Canada)	Wittchen et al. (1992; Munich, Germany)	Chen et al. (1993; Shatin, Hong Kong)	Stefansson et al. (1991; Iceland)	Lee et al. (1990; Seoul, Korea)	Wells et al. (1989; Chirstchurch New Zealand)	Canino et al. (1987; Puerto Rico)	Hwu et al. (1989; Taipei, Taiwan)	Robins and Regier (1991; ECA, USA)
Any disorder	38.8 (0.9)	32.06	–	65.1 (1.6)	39.8	37 (1.5)	28.1 (1.4)	16.3 (0.5)	32.00
Substance abuse/ dependence	20.6 (0.8)	13.51 (1.25)	–	0.7 (0.3)	31.80	21.0 (1.3)	–	0.2 (0.2)	6.2 (0.25)
Alcohol abuse/ dependence	18.0 (0.8)	13.04 (1.27)	–	27.5 (1.5)	21.70	18.9 (1.3)	12.6 (0.9)	33.9 (3.6)	13.8 (0.36)
Schizophrenic/ schizophreniform	0.6 (0.1)	0.72 (0.30)	–	0.3 (0.2)	0.34	0.4 (0.2)	1.8 (0.4)	3.0 (0.8)	1.5 (0.1)
Affective disorders	10.2 (0.6)	12.90 (1.16)	–	5.3 (0.8)	5.52	14.7 (1.0)	7.9 (0.7)	8.8 (1.3)	7.8 (0.3)
Anxiety disorders	11.2 (0.6)	13.87 (1.24)	–	21.7 (1.4)	9.20	10.5 (0.9)	13.6 (1.0)	37.4 (2.9)	8.5
Somization disorder	0.0 (0.0)	0.89 (0.31)	–	0.2 (0.2)	0.03	< 0.1 (0.1)	0.7 (0.2)	0.4 (0.3)	0.13 (0.04)
Antisocial personality disorder	3.7 (0.4)	–	–	0.7 (0.3)	2.08	3.1 (0.5)	–	1.4 (0.5)	2.6 (0.16)

Numerical codes for DSM disorders: substance abuse/dependence disorders 305.XX; alcohol abuse/dependence disorders 303.90/305.00; schizophrenic/schizophreniform disorders 295.XX; affective disorders 296.XX; anxiety disorders 300.XX; somatization disorder 300.81; antisocial personality disorder 301.7

Table 3 Lifetime prevalence rates of specific DIS/DSM-III disorders for each gender compared in percentage, (S.E. in parentheses)

DSM-III disorder	Edmonton, Canada	Munich Germany	Shatin Hong Kong	Iceland	Seoul, Korea	Christchurch, New Zealand	Puerto Rico	Taipei, Taiwan	ECA, USA
Any disorder									
Male	40.7 (1.5)	30.30 (2.37)	38.80 (0.96)	66.0 (2.3)	63.50	40 (2.4)	34.0 (2.3)	27.10 (0.9)	36.00 (0.72)
Female	26.8 (1.1)	33.64 (1.16)	19.34 (1.26)	64.1 (2.3)	18.80	34 (1.7)	22.8 (1.6)	16.3 (0.7)	30.00 (0.65)
Substance abuse/dependence									
Male	32.5 (1.4)	21.23 (2.09)	0.33 (0.12)	0.5 (0.3)	60.04	33.6 (2.4)	–	0.0	7.7 (0.40)
Female	8.6 (0.7)	6.11 (1.16)	0.16 (0.06)	1.0 (0.5)	5.15	8.7 (1.0)	–	0.4 (0.4)	4.8 (0.31)
Alcohol abuse/dependence									
Male	29.3 (1.3)	21.02 (2.13)	8.86 (0.56)	45.6 (2.4)	25.63	32.0 (2.3)	24.6 (1.9)	64.3 (5.0)	23.80 (0.64)
Female	6.7 (0.6)	5.13 (1.09)	0.62 (0.25)	8.5 (1.4)	1.59	6.1 (0.9)	2.0 (0.5)	4.3 (1.3)	4.6 (0.30)
Schizophrenic/schizophreniform									
Male	0.5 (0.2)	–	1.29 (0.21)	0.7 (0.4)	0.48	0.3 (0.5)	2.2 (0.6)	2.8 (1.1)	1.2 (0.2)
Female	0.7 (0.2)	–	0.13 (0.06)	0.0 (0.0)	0.24	0.5 (0.3)	1.4 (0.4)	3.2 (1.1)	1.7 (0.2)
Affective disorders									
Male	7.1 (0.7)	6.42 (1.25)	0.12 (0.6)	2.9 (0.8)	4.31	10.0 (1.5)	4.7 (.09)	7.3 (1.7)	5.2 (0.3)
Female	13.2 (0.8)	18.68 (1.94)	2.44 (0.39)	7.8 (1.3)	6.62	19.4 (1.5)	10.9 (1.1)	10.2 (2.0)	10.2 (0.4)
Anxiety disorders									
Male	8.7 (0.9)	9.07 (1.49)	7.77 (0.55)	11.8 (1.5)	5.26	4.4 (1.1)	11.2 (1.4)	23.9 (3.1)	–
Female	13.8 (0.9)	18.13 (1.97)	11.11 (0.99)	32.2 (2.3)	12.73	16.5 (1.3)	15.7 (1.4)	50.4 (4.3)	–
Somatization disorder									
Male	0.0 (0.0)	0.00 (0.0)	0.17 (0.07)	0.0 (0.0)	0.00	0.0 (0.4)	0.7 (0.3)	0.0	0.02 (0.02)
Female	0.1 (0.1)	1.60 (0.62)	0.29 (0.09)	0.5 (0.3)	0.60	0.1 (0.2)	0.7 (0.3)	0.8 (0.6)	0.23 (0.07)
Antisocial personality disorder									
Male	6.5 (0.7)	–	2.78 (0.33)	1.4 (0.6)	3.54	4.2 (1.1)	–	2.4 (1.0)	4.5 (0.31)
Female	0.8 (0.2)	–	0.53 (0.12)	0.0 (0.0)	0.78	0.4 (0.4)	–	0.4 (0.4)	0.8 (0.13)

Numerical codes for DSM disorders: substance abuse/dependence disorders 305.XX; alcohol abuse/dependence disorders 303.90/305.00; schizophrenic/schizophreniform disorders 295.XX; affective disorders 296.XX; anxiety disorders 300.XX; somatization disorder 300.81; Antisocial personality disorder 301.7

Prevalence of specific psychiatric disorders

To ensure at least a moderate degree of illumination in comparing lifetime prevalence rates of various diagnostic categories, in this paper we focused on eight global diagnostic categories. All specific diagnoses with common characteristics were broken down into a group, e.g., all forms of schizophrenias were collapsed together; major depressive episode, dysthymia and manic episode were grouped into a global category of affective disorders.

Table 2 illustrates the lifetime prevalence rates for the eight specific diagnostic categories considered. In each of the countries reviewed, psychoactive substance abuse, dependence and alcohol abuse and dependence disorders showed high prevalence rates. The rate for substance abuse/dependence ranged from 0.2% in metropolitan Taipei to 21% in Christchurch, New Zealand; the rate for substance abuse/dependence in all the ECA sites in the U. S. combined was 6.2%.

The lifetime prevalence rates for alcohol abuse/dependence ranged from 12.60% in Puerto Rico to 33.9% in metropolitan Taipei. The rates for sites in the Western hemisphere, namely Canada, U. S., and Puerto Rico, were comparable; this was between 13 and 18%. The lifetime prevalence rates for alcohol abuse/dependence from Iceland and Asian centers, namely Korea and Taipei, were very high on direct comparison. The lifetime prevalence rates for anxiety disorders ranged from 8.50% in all ECA sites in the U. S. to a rate of 37.4% in Taipei and 9.2% in Seoul. Edmonton, Munich, and Puerto Rico had almost similar rates of about 13%.

The lifetime prevalence rates for affective disorders ranged from 5.3% in Iceland to 12.90% in Munich, whereas that for schizophrenic/schizophreniform disorders ranged from 0.30% in Iceland and Seoul, to 3.0% in Taiwan. The rates in the U. S. and Puerto Rico were 1.5 and 1.8%, respectively. The lifetime prevalence rate of antisocial personality disorder was highest in Edmonton, with a rate of 3.7%, and lowest in Iceland, 0.7%. Somatization disorder showed the least prevalence of all the above diagnostic categories, with a range of 0.0% in Edmonton to 0.84% in Munich.

Lifetime prevalence of psychiatric disorders by gender

Table 3 illustrates the lifetime prevalence rates for each gender. Upon direct comparison more men than women had psychiatric disorders over their lifetime. This pattern was observed for all the countries. There were gender differences in the prevalence of specific psychiatric disorders: Females had higher prevalence rates of anxiety disorders and major affective disorders; and alcohol abuse/dependence, psychoactive substance abuse/dependence, and antisocial personality disorders showed male predominance. Less common psychiatric disorders, such as schizophrenic/schizophreniform psychosis and somatization disorder, did not show any clear gender differences in the prevalence rates. The prevalence rate for any DSM-III disorder among male subjects ranged from 27 to 66% vs 16 to 34% for female subjects. The modal prevalence for any DSM-III disorder among males was about 35%, whereas a very high rate of 66% was found for male subjects in Iceland. Similarly, the prevalence rate for any DSM-III disorder for female subjects in Iceland was comparatively very high (64%). Substance abuse/dependence was of low lifetime prevalence in Shatin, Hong Kong; Iceland and Taiwan for both genders. Alcohol abuse/dependence was of high prevalence among male subjects in Iceland and metropolitan Taipei. This was about two times and three times the model prevalence, respectively.

The prevalence rate for major affective disorders for male subjects ranged from 0.10 to 10% vs 3 to 19% for female subjects. The prevalence rate for anxiety disorders for male subjects ranged from 4 to 24%; the range for female subjects was 11 to 50%. The lifetime prevalence for anxiety disorders was 50% for Taipei female subjects. This was about three times the model prevalence for female subjects in the individual countries.

Discussion

This study determined the lifetime prevalence rates of DIS/DSM-III disorders across different regions and cultures by reviewing studies that utilized similar case identification procedures and diagnostic criteria. The lifetime prevalence for any DSM-III psychiatric morbidity ranged from 21 to 65%; the modal prevalence rate was about 35% internationally. The results show that the prevalence of psychiatric disorders is higher than previous community surveys (Lin 1953; Srole et al. 1962; Leighton et al. 1963; Leighton 1969) would lead us to believe. The differences could be due, at least in part, to secular trends or methodological factors. For instance in the Midtown Manhattan study (Srole et al. 1962) and the Stirling County study (Leighton et al. 1963), psychopathology classifications were not made on the basis of diagnostic categories, but in terms of "caseness" and "improvement". The application of standardized case definition and diagnostic interview in the DIS studies reviewed ensured better case detection and diagnosis.

It may be conceivable that diagnostic categories are different in both distribution and presentation in contrasting cultural settings. This study shows different prevalence rates for psychiatric disorders across countries and cultures. The lifetime prevalence differences between countries may be due to several factors, namely, real geographic quantitative differences, the use of an unstandardized translated version of the DIS, minor differences in methodology (such as case screening process; sampling process whereby some of the studies utilized subjects in local register of inhabitants and others' households; editing and data computerization) and cultural sensitivity of the DIS. Culture influences expression of mental health distress (Kleinman 1977); thus, cultural differences in meaning and expression of distress should be considered when evaluating psychopathology among subjects who are of different

geographical and cultural backgrounds. The DIS procedure of distilling psychiatric data presupposes the existence of culture-free and phenomenologically pure symptom, implicitly ignoring the influence of culture on psychopathology and phenomenology (Rogler 1993).

Differences in prevalence rates may be due partly to linguistic/translation differences in the utilization of the DIS. Helzer et al. (1990) espoused that, whereas uniformity of administration of the DIS could be achieved across cultures, this does no ascertain that the same illnesses or syndromes are being measured, because optimal linguistic and conceptual equivalence in translation may not always be achieved. Similarly, differences in the demographic composition of the population in the various countries may affect the overall population estimates of these rates. High rates can result from populations being older (i.e., long exposure to risk) as was seen in the case of Iceland with exclusively older subjects who were 55–57 years old at the time of the study. Stefansson and colleagues (1991) reported that the results of the Icelandic study (reviewed along with other studies) were consistent with the findings reported for corresponding age group 45–64 years in the ECA study; and that the high estimates observed for alcohol abuse or dependence could be due to the less restrictive diagnostic criteria and poor applicability of DSM-III criteria for alcohol abuse/dependence in Iceland. Because this review did not consider age-stratified data, it is not possible to make definitive deductions. Comparative epidemiological research in the future needs to take into account age correction for the entire populations being studied.

Urbanization, rurality, and industrialization, among several socioeconomic factors, may also influence lifetime prevalence rates between countries. Substance abuse/dependence was comparatively of a very high prevalence (60%) in male subjects in Seoul, Korea, whereas alcohol abuse/dependence disorder had a high prevalence (64%) among male subjects in metropolitan Taipei. The high rates of alcohol abuse/dependence in Tapei and Seoul, and for psychoactive substance abuse/dependence in Korea (both in Asia), raise questions about whether the rates represent real differences or some local oddity of administration of the DIS. It is conceivable that sociopolitical factors, such as "criminalization" and "covert endorsement" of psychoactive substance, may affect rates of this disorder. Furthermore, DSM-III diagnostic criteria for these disorders may not be culture-blind, and hence, inappropriate for use in Asian countries. Psychoactive substance-related problems have been shown to fluctuate widely over time (Rosen et al. 1983). This is likely to fluctuate between geographical areas and with regard to "demand and supply." This deserves further elucidation.

Both male and female subjects in metropolitan Taipei showed very high prevalence rates for anxiety disorders (24 and 50%; respectively). These high prevalence rates for anxiety disorders among Asian subjects in Seoul and Taiwan raised an intriguing question regarding a plausbile explanation. The Taiwan Chinese might be more open in reporting psychiatric symptoms. It has been reported that Europeans and Euro-Americans tend to report lower symptom levels compared with Asians and Asian-Americans (Strong 1977; Marsella et al. 1975; Cheung 1982). There may be racial, cultural, or biological factors responsible for this, and further study is deserved.

The prevalence rate of schizophrenia seems universal (Torrey 1987, and its prognosis varies across cultures (WHO 1979; Leff et al. 1990). In this study the prevalence rates of schizophrenic/schizophreniform disorders are found to be similar to those estimated in other international studies (WHO 1979; Jablensky et al. 1992). The thesis that the course of schizophrenia is more favorable in developing than in developed countries (WHO 1979; Leff et al. 1990) has occasionally been questioned (Edgerton 1980; Cohen 1992; Edgerton and Cohen 1994). Favorable course and outcome for schizophrenia have been reported for research conducted in developed countries in Europe (Ciompi 1980), the Vermont project in the U. S. (Harding et al. 1987). The reasons for the variation in course and outcome between developing and developed societies are as yet inadequately understood, but probably in volve a number of environmental factors including culture (Edgerton and Cohen 1994).

Gender differecens in specific psychiatric morbidity are clearly shown in the results of this study. Psychoactive substance abuse/dependence, alcohol abuse/dependence, and antisocial personality were male-predominant disorders. Anxiety disorders and major affective disorders were female-predominant disorders. It would be desirable to know why men and women differ in psychiatric morbidity. Gove and Tudor (1973) speculate that women's emotional problems are caused by the ungratifying, restrictive, and demeaning role of being a housewife or due to job discrimination coupled with additional housework for a married working woman. Horwitz (1977) espoused that it is more culturally acceptable for women to express their emotional feelings and difficulties than men. The gender difference in prevalence rates of psychiatric morbidity may also be due to other social factors such as illness behavior (Parson 1953), biology, and social situation (Paykel 1991).

The ECA project and other DIS/DSM community surveys have been described as third-generation epidemiological surveys (Dohrenwend et al. 1992). Aside from criticism on psychometric grounds, the DIS is limited in its application to ICD, Index of Definition (ID), and CATEGO (Wing and Stuart 1978), which are common diagnostic algorithms used in British psychiatry. This may account for its nonutilization in community epidemiological surveys in Britain; we did not find any published DIS/DSM-III study from Britain.

More specifically, there are concerns about the DIS tendency to miss some major disorders such as paranoid disorder, atypical psychosis, and brief reactive psychosis (Anthony et al. 1985; Helzer et al. 1984; Wittchen et al. 1985). With regard to Axis II disorders, apart from antisocial personality disorder, the DIS does not measure the other 11 types of personality disorders described in the DSM-III-R (Spitzer et al. 1990). These flaws in the DIS

could be remedied by use of International Personality Disorder Examination (IPDE; WHO 1992). The DIS relies heavily on the subject's report of symptoms (Folstein et al. 1985; Escobar et al. 1986). Self-reports, however, may be of dubious validity in diagnosis (Bland et al. 1990), or the individual may under- or overreport symptoms or make up any kind of pathology according to the needs of the situation. Whereas problems of defining a psychiatric "case" and criteria for valid classification have limited the validity of cross-cultural psychiatric epidemiological studies, measurement strategies based on uniform classification as well as diagnostic and assessment systems must be revised to accommodate for this variation (Marsella 1988).

Future directions

The focus for future and fourth-generation studies should be toward use of standardized international diagnostic interviews with robust psychometric properties. This would allow for comparability of diagnoses in different systems or countries. The CIDI Core Version 1.1 meets these requirements: It is highly structured and can be used by lay interviewers and for epidemiological studies. The cross-cultural acceptability and feasibility of the CIDI and its reliability in different settings and countries have been tested (Wittchen et al. 1989, 1991). The CIDI was judged to be acceptable for most subjects and appropriate for use in different settings. Data collected with CIDI can be analyzed with CATEGO, Index of Definition, DIS programs, and can serve both the DMS-III-R (American Psychiatric Association 1987) and ICD-10 (WHO 1992). A version of CIDI that will incorporate DSM-IV is being prepared (Janca et al. 1994).

Future epidemiological studies should proceed beyond demonstrating a range of demographic (gender, age, social class) and cultural variables associated with mental disorders. The mechanisms by which these factors operate should be elucidated, and epidemiological findings should be integrated with clinical findings. Generally, there should be more multicentre, collaborative, and prospective epidemiological studies. Specifically, there should be more psychiatric community epidemiological studies to address cross-cultural differences in developing countries. Attempts should be made to (a) collaborate with providers of alternative/traditional health care, (b) modify and adapt psychiatric technology and tools to local communities where they are applied without sacrificing validity, and (c) interviews should be standardized for the cultural realities and socioeconomic conditions of the communities being surveyed.

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