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Studying the Mental Health of a Nation: A Preliminary Report on a Population Survey in Singapore

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ABSTRACT

Aim: A Singapore Mental Health Survey was designed to study the prevalence and pattern of psychiatric morbidity of the general population. Community surveys reveal the true pattern of mental disorders, free from any self-selection into, or referral within the health care system.

Methods: A cross-sectional survey design was used to estimate the point prevalence of minor psychiatric morbidity (MPM) in an area-probability sample drawn from different regions. Disproportionate quota sampling yielded approximately equal numbers of Chinese, Malays and Indians for inter-ethnic comparison. The General Health Questionnaire, 28-item version (GHQ-28) measured psychoemotional symptoms in 3,020 subjects aged between 13-65 years. The GHQ-28 was validated against ICD-10 psychiatric diagnoses derived from structured psychiatric interview with the Composite International Diagnostic Interview (CIDI).

Results: The optimal cut-off point for the GHQ-28 was determined to be 4/5 for Chinese, and 5/6 for Malays and Indians. Using the validated ethnic-specific cut-offs, MPM rate for Chinese was 17.4%, Malays 15.1% and Indians 17.8%. The population MPM prevalence rate was estimated to be 16.6% after standardisation with population census data. Specific types of ICD-10 psychiatric disorders which give rise to MPM were mainly anxiety and depressive disorders. Twelve percent of individuals with MPM had at least one ICD-10 disorder in the previous year.

Conclusion: Two-staged methodology is an efficient, cost-effective approach to study population prevalence of mental illness. Screening instruments utilised should be validated specifically for the culture and setting. Information from population surveys of psychiatric morbidity are important for the planning of mental health services for the country.

Keywords: epidemiology, psychiatric morbidity, population prevalence, GHQ

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INTRODUCTION

The potentially huge burden of mental ill-health worldwide has been emphasised by the World Health Organisation (WHO) in its report, *Investing in Health Research and Development*[1]. Unipolar depression for example, is predicted to become "the leading cause of disease burden in the developing regions". In order for Singapore and other countries in the region to adequately address the problem of mental ill-health, it is first necessary to ascertain which psychiatric disorders are most prevalent and what its determinants are.

Studying community samples is especially important, since the majority of people with mental disorder do not seek treatment for their psychological distress[2]. Concentrating on clinical populations alone overlooks the many who suffer from the most common psychiatric disorders like depression and anxiety, but who would never otherwise present to a doctor or mental health professional. Indeed, we know from a number of studies that psychiatric disorders are very common in the general population. These are sometimes termed 'minor' or 'neurotic' disorders, but are known to give rise to significant morbidity, including reduced productivity at work; increased sickness absenteeism and personal disability. The overall poorer quality of life resulting from such psychiatric morbidity is difficult to quantify, but can exact a high societal and personal cost[3].

Studying the general population of a whole nation is however, a large-scale undertaking demanding vast financial and manpower resources; thus, few have been successfully accomplished. Notably, the National Institute of Mental Health, Epidemiological Catchment Area (ECA) surveys[4] and the more recent National Comorbidity Study (NCS)[5] have shaped mental health policy and practice to a great extent in the USA. The OPCS National Psychiatric Morbidity Survey in Great Britain[6] represents yet another large-scale effort to study the prevalence of psychiatric morbidity on a national level. Taiwan's community survey of minor psychiatric morbidity[7] and the Shatin Community Mental Health Survey in Hong Kong[8] have similarly provided invaluable mental health data in Asian populations. The determinants of mental ill-health have been shown to include a wide variety of social and environmental factors[9,10]. Although there is a cross-cultural similarity of symptoms which constitute psychiatric diagnoses[11], symptoms may manifest differently across socio-cultural backgrounds. In a study which compared five Asian sites (Thailand, Indonesia, China, Japan and Taiwan), symptom profiles of neurotic disorders were found to be significantly different[12]. Epidemiological findings are unique to

a particular population due to differing cultural, socio-demographic, or even biological environments.

There has been a relative paucity of population-based community surveys of psychiatric morbidity in our region. Bahar et al[13], studied the mental health of Indonesians in Sumatra, while Ramli et al[14] concentrated on a rural population in Malaysia. In Singapore, population-based epidemiological studies of psychiatric morbidity have been limited to administration of screening instruments to detect emotional symptoms in the community. The Singapore Ministry of Health's 1978 survey[15] employed the Langner questionnaire and reported that 8.4% had neuroses. The Singapore Association for Mental Health[16] utilised a modified, interviewer administered version of the General Health Questionnaire to estimate psychiatric morbidity in the community and found a rate of MPM of 17.95%. These studies, though providing an indication of how common psycho-emotional symptoms are in the community, have certain shortcomings, principally the lack of validation of the instruments utilised specific for our culture and setting. They also did not study specific psychiatric disorders.

Our study attempts to fill a crucial gap in available mental health information on Singapore. It employs instruments specifically validated for our population and uses structured psychiatric interview to define operationalised psychiatric diagnoses. We present here, the methodology and preliminary results from this Singapore Mental Health Survey. Our findings and experiences may offer useful lessons for the conduct of future population psychiatric surveys both here and in the region.

METHOD

A cross-sectional survey design was employed to determine the point prevalence of minor psychiatric morbidity (MPM) in an area-probability sample drawn from different regions in Singapore. Disproportionate stratified quota sampling was employed to obtain approximately equal-sized samples of respondents from the three ethnic groups. Subjects sampled were also stratified by age, comprising adolescents aged 13 – 19 years and adults, 20 – 65 years.

The frequency and pattern of common psychological symptoms (ie. MPM) in the general population was estimated using the General Health Questionnaire, 28 question version (GHQ-28), a brief, subject-administered (ie. self-rating) questionnaire that measures current non-psychotic, non-organic psychiatric symptoms[17,18]. Indices of validity (sensitivity and specificity) of the GHQ may vary considerably, depending on the setting population being studied[19]. We thus validated and compared the GHQ-28 among the three major ethnic groups living in Singapore. Three language versions were available – English, Chinese and Malay. Indians in Singapore are usually literate in English or Malay and did not require an Indian-language version. Subjects chose to answer the GHQ in the language version that they were most comfortable with.

The GHQ-28 was validated against the Composite International Diagnostic Interview (CIDI), a diagnostic instrument developed by the World Health Organisation (WHO) for use in various cultures[20], that assigns operationally defined ICD-10 psychiatric diagnoses. Stratified sampling was conducted of subjects with GHQ scores clustered around the 'traditional' cut off of 4/5 points. Selected individuals were contacted by phone and/or letter, visited again in their households and administered the CIDI. Modules of the CIDI detecting the following ICD-10 diagnoses were administered: depressive and dysthymic disorders (F32,33), manic and bipolar affective disorder (F31), phobic and anxiety disorders (F40,41), obsessive compulsive disorder (F42), dissociative and somatoform disorders (F44,45).

The validity coefficients of sensitivity and specificity were calculated for various GHQ cut-off scores and a receiver operating characteristic (ROC) curve was generated to determine the best cut-off point. Utilising the validated optimal cut-off points for the GHQ, population prevalence of MPM was estimated.

In order to identify which specific diagnostic categories are commonly present as indicated by 'high' (above threshold) GHQ scores, one of the 5 sampled regions – Clementi was studied in greater detail. All subjects residing in Clementi who had scored above the GHQ threshold, were interviewed with the CIDI and assigned an ICD-10 diagnosis if present.

RESULTS

Characteristics of respondents

A total of 3,020 subjects were interviewed in the first phase of the study – 1,149 Chinese, 1,024 Malays and 847 Indians. There were 50.4% males and 49.6% females. The age of the sample was relatively young with a mean of 31 years (SD=10.2 years). Table I compares the sociodemographic characteristics of our sample population with the Singapore population[21]. In the second validation stage, a sample of 339 subjects (121 Chinese, 112 Malays and 106 Indians) scoring between 1 to 9 points on the GHQ were interviewed with the CIDI.

Validation of the GHQ-28

Comparing the three ethnic group populations, the Chinese had a lower cut-off of 4/5 compared with Malays and Indians who had cut-off levels of 5/6 (Fig 1). For the Singapore general population as a whole, the 'ideal' cut-off point was 5/6.

Estimated prevalence of psychiatric disorder

Using the validated GHQ threshold levels, the estimated prevalence of minor psychiatric morbidity in the sample was 17.4% for Chinese, 15.1% for Malays and 17.8% for Indians. For all

Table I – Sociodemographic profile of the study sample compared with the Singapore general population (1995)

	Sample population %	Singapore population %
Sex		
Male	50.4	50.6
Female	49.6	49.4
Ethnicity		
Chinese	38.0	77.7
Malay	33.9	14.1
Indian/Others	28.1	8.2
Age		
13 – 19	25.3	11.3
20 – 29	20.3	19.8
30 – 39	27.7	34.3
40 – 49	20.3	18.3
50 – 65	6.3	12.9

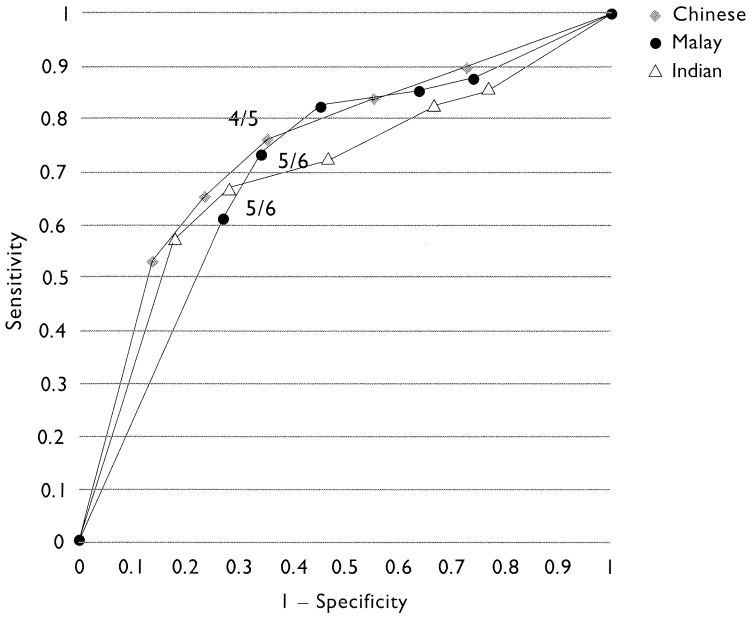

Fig 1 – ROC plot for GHQ-28 comparing 3 ethnic groups

Table II – 12-month prevalence of CIDI ICD-10 disorders among GHQ high scorers in Clementi

ICD-10 disorders	Prevalence %	n
Affective disorders		
Major depressive episode	5.5	22
Dysthymia	1.8	7
Manic episode	0.5	2
Any affective disorder	7.8	31
Anxiety disorders		
Panic disorder	2.0	8
Agoraphobia without panic	0.8	3
Social phobia	2.5	10
Simple phobia	2.5	10
Generalised anxiety disorder	1.5	6
Any anxiety disorder	9.3	37
Obsessive compulsive disorder	0.3	1
Somatoform disorders		
Psychogenic pain disorder	1.3	5
Somatization disorder	0.3	1
Hypochondriacal disorder	0.5	2
Any CIDI disorder	12.0	48
Two or more CIDI disorders	7.0	24

three races considered together, the estimated prevalence was 16.8%. Direct standardisation for sex, age, and ethnicity (the parameters stratified for in sampling) according to the Singapore population composition[21], showed a similar rate of 16.6%, which is also the population prevalence rate.

GHQ and specific psychiatric diagnoses

Four hundred respondents were administered the GHQ in the first stage in Clementi, of whom 71 (17.8%) scored above threshold. Of these, 60 were successfully interviewed with the CIDI (response rate of about 85%).

Table II shows the 12-month prevalence rate of specific ICD-10 psychiatric disorders as derived from the CIDI. Affective disorders (7.8%) and anxiety disorders (9.3%) constituted the bulk of psychiatric disorders present in individuals who scored above threshold on the GHQ. Overall, the 12-month prevalence of at least one specific ICD-10 disorder was 12.0%. Of the affective disorders, depressive disorder was the most common (5.5%) and constituted the single most common discrete psychiatric diagnosis. Manic and bipolar disorders were rare.

As a group, phobic and anxiety disorders were more common than depressive disorders. The distribution of discrete anxiety disorder type showed an even spread among panic, social phobia, simple phobia and generalised anxiety disorders. Threshold level somatoform disorders were not common, the commonest being somatoform pain disorder. Co-morbidity was relatively frequent – 7% had two or more threshold level diagnoses.

DISCUSSION

In epidemiological investigation, it is common to use a screening instrument to identify individuals 'at-risk' of having psychiatric disorder, who are then interviewed in detail to diagnose the presence/absence of actual illness[22]. Although it would have been ideal to interview all subjects with the CIDI, the cost and resources needed would have been prohibitive. Especially for developing nations in our region, such two-staged or multi-staged methodology is an efficient, cost-effective way to study the prevalence of illness in large populations[23].

Screening instruments however, should be validated for the setting and culture in which it is to be used. We found for example, that Chinese in Singapore have a lower cut-off on the GHQ-28 than Malays and Indians. This may be related to differences in perception, interpretation and expression of psychological distress. Higher GHQ cut-off thresholds have been observed in the more 'expressive' cultures, eg. Spain and Italy vs United Kingdom or Iceland, although this has not been consistently demonstrated. Chinese in Singapore may be less expressive of their psychological distress and may be less likely to endorse items on the GHQ even when psychologically ill as compared with Malays and Indians.

Application of different cut-off points, allowed for more accurate inter-ethnic comparisons to be made. If a uniform cut-off point of 5/6 had been applied for the sample overall, the prevalence of psychiatric disorder as estimated by the GHQ-28 would have been 14.7% in Chinese, 15.1% in Malays and 17.6% in Indians. In actual fact, the prevalence, taking into account a lower cut-off of 4/5, makes the prevalence of psychiatric disorder for Chinese 17.4% instead. The prevalence of MPM across ethnic groups was not statistically significant.

The prevalence of minor psychiatric morbidity in Singapore, as estimated by the GHQ-28 was 16.6%. A comparison with other population studies that also used the GHQ to estimate prevalence shows similar levels of psychiatric morbidity in a number of studies. Finlay-Jones & Burvill[24] reported 16.3% of their subjects scoring above threshold. Vazquez-Barquero et al[25]found 18.5%, and Hodiamont et al[26]. 22.7% of their study populations who experienced MPM. Verhaak[27] and Goldberg et al[28] reported lower prevalence rates of 12.5% and 11.3% respectively. Our estimated MPM prevalence is comparable with the earlier SAMH study in Singapore utilising the GHQ-28, which reported a MPM of 17.95%[16], but methodological constraints limit valid cross-comparison or analysis of secular trends.

In establishing which specific disorders correspond to a high GHQ score, we identified the common disorders to be affective (7.8%) and anxiety disorders (9.3%). The 12-month prevalence rate for having at least one ICD-10 disorder was 12%. In contrast, the reported one-year prevalence rate of CIDI-derived DSM-III-R disorders in the NCS study[5], which included substance abuse/dependence was 29.5%. In another recent study of adolescents and young adults in Munich, which also utilised the CIDI[29], the 12-month prevalence rate of mental disorders excluding substance-use disorders was 17.5%. Anxiety disorders were the commonest group of disorders followed by affective conditions in the NCS study. Depressive and anxiety disorders were also reported to be the commonest disorders in the Munich study, however depression was more common.

Although the central purpose of psychiatric epidemiology is to guide mental health practice and policy, findings have to be rationally interpreted. Discrepant findings have made cross-comparisons between different epidemiological studies extremely difficult. While the uniform utilisation of standardised highly structured diagnostic instruments like the WHO's CIDI may limit variations, small changes in diagnostic categories or threshold levels still give rise to large differences in prevalence rates.

Another point of controversy is the 'high' prevalence rates reported in most epidemiological studies in the community. Our study for example, indicates that about one out of six individuals in Singapore are deemed to suffer from psychiatric morbidity. Mental health policy makers have to decide how to adequately respond to these individuals with identified 'morbidity'.

Clearly, experiencing emotional symptoms or even receiving a psychiatric diagnosis is not equivalent to a need for treatment. This is especially due to the fact that epidemiological case identification tends toward diagnosis of milder, 'borderline' conditions, for which there is no clear boundary with normality. The Camberwell Needs for Care Survey[30] is important in this regard. Preliminary results have documented that at least 10% of the population were identified as having a need for treatment of a psychiatric condition. Their study of community subjects between 18 – 65 years, utilised similar methodology to our study, including a GHQ-28 screening first stage and second stage psychiatric interview. Their one-year prevalence rate of ICD-10 disorder, of 12.3% was very similar to our result as well. We can thus extrapolate, that the majority of individuals as identified in our study in Singapore are not only experiencing psychiatric symptoms or disorder, but many are also likely to be in need of mental health services.

CONCLUSION

The key to provision of mental health services of a nation is through well-planned epidemiological research[35]. The data obtained from this study provides a good estimate of the extent of psychiatric morbidity in Singapore. Further reports will provide details on the prevalence rates in different sociodemographic groups, life-events and stresses experienced, help-seeking behaviour and service use. These findings will allow us to target population subgroups at increased risk, facilitating prevention, early intervention and treatment of psychological morbidity in the community. There is a need for us in Singapore and the region, to invest adequately in mental health research and development. In so doing, we can do much to ensure a healthy and vital society for ourselves in the future.

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