

ORIGINAL ARTICLE

**A PRELIMINARY STUDY ON THE SPECIFICITY AND SENSITIVITY VALUES AND INTER-RATER RELIABILITY OF MINI INTERNATIONAL NEUROPSYCHIATRIC INTERVIEW (MINI) IN MALAYSIA**

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Abstract

**Objective:** The MINI International Neuropsychiatric Interview (MINI) is a short, structured diagnostic interview compatible with the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV). It was designed for clinical practice, research in psychiatric, primary care settings and epidemiological surveys. This preliminary study aims to evaluate the reliability and validity of the Malaysian Version of MINI for Major Depressive Disorder and Generalized Anxiety Disorder symptoms criteria only. **Methods:** Six hours of MINI training was given as part of a National Health Morbidity Survey training program for layman interviewers (n=229) and three videos were prepared by an expert psychiatrist for inter-rater reliability purposes. Meanwhile, for validity purposes, the MINI was administered to patients with Major Depressive Disorder (n=30), Generalized Anxiety Disorder (n=20) and to a normal population (n=60), to conform against the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV) that was administered by psychiatrists. **Results:** Overall the inter-rater reliability was satisfactory (0.67 to 0.85) and the concordance between the MINI's and expert diagnoses was good, with kappa values of greater than 0.88. **Conclusions:** The Malay version of the MINI is adjusted to the clinical setting and for the assessment of positive cases in a community setting. Modifications were highlighted to correct any identified problems and to improve the reliability of the MINI for future research and clinical use. *ASEAN Journal of Psychiatry, Vol. 13 (2) July – December 2012: XX XX*

**Keywords: MINI, Major Depressive Disorder, Generalized Anxiety Disorder, Inter-Rate Reliability, Validity**

## **Introduction**

In conducting an epidemiological survey, there is a need for a reliable and valid instrument. An inappropriate assessment may lead to failure to detect and to diagnose a disorder, and consequently block the referral for appropriate intervention [1]. This would be harmful to individuals who suffer from mental disorders as appropriate intervention could be offered and it could affect the quality of life of a person and also prove to be a burden to the social and economic growth of a country [2].

In that regard, the World Health Organization (WHO), using a MINI International Neuropsychiatric Interview (MINI) as a psychiatric interview tool to perform a multicentre study in 14 countries, was able to report that on the average 24% of the people who attended primary care presented at least one current mental disorder, while another 9% presented clinically significant subsyndromal conditions [3]. The MINI was developed by French and North American researchers, and presented a good validity in a multicentre study (performed in Europe) that compared the diagnoses by general practitioners obtained using the MINI with the diagnoses obtained by psychiatrists using non-structured interviews [4].

The MINI is short, simple, clear and easy to administer, being shorter than the typical research interview but more comprehensive than the screening test [4]. It is also highly sensitive (i.e. a high proportion of patients with disorders can be detected by the instrument). It is specific (i.e. it has the ability to screen out patients without disorders). The MINI is compatible with international diagnostic criteria, including the International Classification of Disease (ICD-10) as well as the Diagnostic and Statistical Manual of Mental Disorders (DSM). It is useful in clinical psychiatry as well as in research settings [4].

Historically, for epidemiological surveys in the United States of America (USA), the Diagnostic Interview Schedule (which later generated the DSM-III), a modified version of the Composite International Diagnostic Interview (CIDI), and the Structured Clinical Interview for DSM-III-R Diagnosis (SCID) were used as a structured research diagnostic interview that could generate reliable psychiatric diagnoses in general population samples [5]. Meanwhile, in Asian countries, the MINI has been validated in several countries [6, 7, 8] but General Health Questionnaire (GHQ) was used in Thailand [6] and Singapore [7] as a screening tool for psychiatric morbidity. However, their studies used two-phases of screening by having gold standard measures to confirm the diagnoses and to report their epidemiological data.

In the case of Malaysia, the first National Health and Morbidity Survey (NHMS) was conducted in 1986 by the Institute for Public Health (IPH), which is currently one of the research organizations under the umbrella of the National Institute of Health (NIH). From the first NHMS, the survey was conducted 10 yearly; i.e. the second and third NHMS 1996 and 2006, respectively. The GHQ-28 was used as a screening tool for psychiatric morbidity in the country with no second-stage of assessment to confirm the diagnoses [9]. To date, the majority of researches on the prevalence of depression and anxiety have been undertaken with screening tools instead of diagnostic interviews [1]. For this reason, and in order to be consistent with other countries, the MINI needs to be validated before it can be used with confidence to conduct such surveys for an epidemiological research or clinical study in Malaysia. Until today, even though the MINI has been used a lot in a clinical setting, no studies have yet validated the Malay version of the MINI.

Hence, the purpose of the present study is to evaluate the Malay version of the MINI in term of its reliability and validity. As this is a

preliminary study, only two diagnoses (i.e. Major Depressive Disorder and Generalized Anxiety Disorder) are conducted. It is hypothesised that the MINI for MDD and GAD would be acceptable and reliable to be used as a diagnostic tool in a research and clinical setting in Malaysia.

## **Methods**

### ***Participants***

#### ***(a) Interviewer' versus psychiatrist's video rating***

The inter-rater reliability was assessed in a group of 229 interviewers. All the interviewers had a minimum passing grade of secondary school level of education. An expert psychiatrist [last author] prepared the videos consisting of a session with patients using the MINI questionnaire. The interviewers then rated the answers after watching the video. The patients who were selected in the video were from among those suffering from Major Depressive Disorder and Generalized Anxiety Disorder, and persons with no psychiatric diagnosis. The interviewers were given a half-day's (6 hours) training on the disorders and also on interview skills prior to the video session.

#### ***(b) Patients and normal population***

Thirty patients with Major Depressive Disorder, 20 patients with Generalized Anxiety Disorder, and 60 healthy, non-psychiatric volunteers were recruited from psychiatric clinics, and primary healthcare centre.

### ***Materials***

The main instrument for this study was the MINI International Neuropsychiatric Interview (MINI). The MINI, devised by Sheehan and Lecrubier [4], is an internationally used diagnostic interview that generates psychiatric diagnoses for the Diagnostic and Statistical Manual for Mental Disorders-IV as well as the International Classification of Disorders-10. It is a short, structured interview that has been developed and is being widely used in epidemiological studies. It has been validated

against the SCID-P (Structured Clinical Interview for DSM-IV – Patient Version) and the CIDI (Composite International Diagnostic Interview), as well as against expert opinion. It has been shown to have a high clinical utility and patient acceptance [10]. A multicentre study that compared the diagnoses by general practitioners obtained using the MINI with the diagnoses obtained by psychiatrists using non-structured interviews obtained a kappa coefficient between 0.41 and 0.68, a sensitivity between 0.41 and 0.86, and a specificity between 0.84 and 0.97 [11]. The “gold standard” diagnosis was established using the Structured Clinical Interview for DSM-IV. In this study questions pertaining to Generalized Anxiety Disorder was referred to the MINI version 6.0 while the format of the questions for Major Depressive Disorder was taken from the MINI version 5.0.

### ***Procedure***

***Translation and back-translation procedures*** - The group in charge of the translation from English to the Malay language was composed of psychiatrists, clinical psychologists and public health officers.

The translation procedure was divided into four distinct steps. First, the group had an agreement meeting to work out and discuss the comprehensibility, acceptability and cultural applicability, as well as the appropriateness of the format, wording and phrasing of the questions. Second, each member of the group was in charge of a number of modules. Third, for face validity, the modules were tested out on a group of people from various levels of education in order to see the whether the questions made sense to them. Finally, a concordance meeting with the whole team was held after the completion of each module with the aim of reading the Malay version to compare it to the original English version, and to work on the cultural and social weight of the words and sentences. For the back-translation procedure, an independent group proceeded to do the back-translation of the fully revised translated version into English. Then, a comparison of the back-

translation with the original version was conducted for semantic and conceptual equivalence.

***For the video rating during the MINI training workshop*** - The expert was a professor of psychiatry (MT) and he used the MINI to interview patients. The interviewers then rated the MINI questionnaires based on the answers given by the patients in the video. Three videos were shown to differentiate between Major Depressive Disorder, Generalized Anxiety Disorder and no diagnosis. The interviewers were given a half-day's training that included a lecture and role-playing in order for them to be able to comprehend and experience how to conduct the MINI interview prior to the video rating.

For validity purposes, both the "MINI interviewers" and the expert were blind towards each other's diagnosis. Firstly, the MINI interviewers (clinical psychologists) conducted the interviews with the patients and the normal population and then referred the participants to the experienced psychiatrist to confirm their diagnoses based on the DSM-IV criteria. The DSM-IV diagnosis is a semi-structured interview that should only be used by experienced professionals specializing in clinical psychiatry because it requires extensive knowledge in this area. All the participants were asked to sign a consent form prior to participating in the study. The research project was approved by the Research Ethics Committee of the Ministry of Health, Malaysia.

### ***Statistical Analyses***

The specificity, sensitivity, positive and negative predictive values were computed using the XLSTAT. The inter-rater reliability was computed using the equation for the generalized kappa as proposed by Fleiss [12]. The concordance between the diagnoses obtained

with the MINI and those obtained with the SCID was evaluated through the kappa coefficient. To perform a qualitative analysis of the kappa coefficient values — which measure the proportion of diagnostic concordance observed between raters, correcting the casual concordance proportion that would usually be expected — it was considered that values above 0.75 indicated excellent concordance; values between 0.40 and 0.75, satisfactory concordance; and below 0.40, unsatisfactory concordance. To evaluate the predictive validity of the MINI diagnoses in relation to the SCID, calculations were made regarding the sensitivity, specificity, as well as positive and negative predictive values and total accuracy, considering the presence or absence of psychiatric disorders measured by the DSM-IV as the gold standard.

## **Results**

### ***Inter-rater reliability***

An inter-rater reliability analysis using the Fleiss' kappa statistics was performed to determine the consistency among the raters. For session 1, the Fleiss' kappa was 0.67 (SE = 0.001; CI = 0.67-0.68) indicating a substantial agreement between the raters. The results for session 2 revealed a strong agreement between the raters with a Fleiss' kappa of 0.85 (SE = 0.0008; CI = 0.850 – 0.853).

### ***Validity***

The results for the kappa subscales of specificity, sensitivity, positive predictive values, and negative predictive values are presented in Table 1. There are four categories presented in the table: no diagnosis, Generalized Anxiety Disorder (GAD), Major Depressive Disorder-Lifetime (MDD-LT), and Major Depressive Disorder-Current (MDD-C). In general, these obtained values were all very good indicating the adequate validity of the Malaysian version of the MINI.

**Table 1. Sensitivity and specificity of the Malaysian version of the MINI per diagnostic class using the DSM-IV as the gold standard (n = 110)**

	True Positive	True Negative	False Positive	False Negative	Kappa (95% CI)	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value
No Disorders	55	50	4	1	0.91 (0.83-0.98)	0.98 (0.89-0.99)	0.93 (0.81-0.98)	0.93 (0.83-0.98)	0.98 (0.88-0.99)
GAD	18	88	4	0	0.88 (0.76-0.99)	1 (0.78-1.00)	0.96 (0.87-0.99)	0.82 (0.59-0.94)	1 (0.95-1.00)
MDD-LT	16	92	0	2	0.93 (0.84-1.03)	0.89 (0.64-0.98)	1 (0.95-1.00)	1 (0.76-1.00)	0.98 (0.92-0.99)
MDD-C	25	84	1	0	0.97 (0.93-1.02)	1 (0.83-1.00)	0.99 (0.93-0.99)	0.96 (0.78-0.99)	1 (0.95-1.00)

*Note: Generalized Anxiety Disorder (GAD); Major Depressive Disorder-Lifetime (MDD-LT); Major Depressive Disorder-Current (MDD-C)*

## **Discussion**

This study proved that the Malaysian version of the MINI is reliable and valid in eliciting symptoms criteria used in making DSM-IV diagnoses for Major Depressive Disorder and Generalized Anxiety Disorder in less than five minutes.

The main finding of this study is the good psychometric characteristics of the MINI applied by the interviewers after a MINI training workshop. The kappa coefficients between the raters showed values ranging from satisfactory to excellent (0.67 to 0.85). Similarly, this study reported almost similar results to Moroccan (0.79 to 0.95) [13] and Brazilian studies (0.65 to 0.85) [14]. When comparing these results with those obtained by the original MINI development group in a European multicentre study (kappa between 0.41 and 0.68) [5] and a Japanese study [8], the present study revealed higher concordance levels.

One of the reasons could be that a MINI training was offered to the interviewers before they did the video rating. In this regard, the present results cannot be generalized for training models that are less intensive and which use less diverse educational activities or experienced trainers, as in this study all the trainers for the MINI training possessed at least a minimum of 5 years working experience as psychiatrists or clinical psychologists. Regarding the impressive validity results (kappa values of 0.88 to 0.97), the MINI interview was conducted by clinical psychologists and then referred to psychiatrists to confirm the diagnoses. Most of the clinical psychologists and psychiatrists considered the Malay version of the MINI as acceptable and comprehensible for layman interviewers and their patients, and clinically relevant to elicit symptoms criteria in making DSM-IV diagnoses of Major Depressive Disorder and Generalized Anxiety Disorder.

This paper is the first report on the validation of the MINI against the DSM-IV by psychiatrists. In that regards, two important points need to be highlighted for future research is to increase the

sample size and to further evaluate other specification for psychometric properties other than what has been reported. On the other note, based on the results of this study, for clinician or researchers who intended to use MINI, there are several questions in the MINI need to be used in careful way of questioning and intonation in order to gain understanding from respondent. For instance, there are few colloquial issues such as “*tak keruan*,” “*perkara rutin*,” “*tekanan yang berlebihan*,” “*perkara yang dinikmati*,” and the word “*gejala*,” which should be taken into consideration when conducting interviews with people from different levels of education and for whom Malay is not their main spoken language at home.

In conclusion, the present study showed that the MINI is a useful instrument with good psychometric qualities in a real world setting when used by layman interviewers to conduct a large scale epidemiological survey. Therefore, proper training is important in order to ensure that the interviewers will be able to conduct the interview in a similar way as the mental health professional’s interview. On the same note, consultation and interviewing skills also need to be emphasised besides being able to conduct the MINI interview in order to get a good response from the targeted population. It is highly recommended that validation studies be conducted for the other disorders listed in the original MINI diagnostic interview in future to cater more to psychiatric morbidity in epidemiological surveys or clinical studies.

The Malaysian Version of MINI, especially for Major Depressive Disorder and Generalized Anxiety Disorder, can be used by academic researchers and layman interviewers (with adequate training) for rapid screening of homogenous samples for clinical trials and epidemiology studies. It has potential applications as a diagnostic screening tool for community surveys, psychiatric hospital admissions and outpatient clinic evaluations as a first step in outcome tracking and continuous quality improvement programs. For research matters, this instrument will be used soon in Malaysian national epidemiological surveys,

which will provide more accurate prevalence rates of mental disorders in a representative sample of the general population of Malaysia.

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### **References**

1. Mukhtar F, Oei TPS. A Review on Assessment and Treatment for Depression in Malaysia. *Depression Research and Treatment*. 2011, Volume 2011, Article ID 123642, 8, doi:10.1155/2011/123642.
2. Mukhtar F, Oei TPS. A Review on the Prevalence of Depression in Malaysia. *Current Psych Rev*. 2011; 3:234-238.
3. Kessler RC, Demler O, Frank RG, Olfson M, Pincus HA, Walters EE, et al. Prevalence and treatment of mental disorders 1990–2003. *N Engl J Med* 2005;352:2515–23.
4. Sheehan DV, Lecrubier Y, Harnett-Sheehan K, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar G: The MINI International Neuropsychiatric Interview (M.I.N.I.): The Development and Validation of a Structured Diagnostic Psychiatric Interview. *J. Clin Psychiatry*, 1998; 59 (suppl 20): 22-33.
5. Sheehan DV, Lecrubeir Y, Harnett-Sheehan K, Janavs J, Weiller E, Bonara LI, Keskiner A, Schinka J, Knapp E, Sheehan MF, Dunbar GC. Reliability and Validity of the MINI International Neuropsychiatric Interview (M.I.N.I): According to the SCID-P. *European Psychiatry*. 1997; 12:232-241.
6. Piyavhatkul N, Krisanaprakornkit T, Rangseekajee P, Jareonsettasin T, Paholpak S, Visasiri S, Mahaton S, Tong-on S. The Validity and Reliability of Thai General Health Questionnaire-28 in Northeastern Thai Population, *J Psychiatr Assoc Thailand* 1998; 43(4): 325-35.
7. Fones CS, Kua EH, Ng TP, Ko SM. Studying the mental health of a nation: a preliminary report on a population survey in Singapore. *Singapore Med J*.1998;39(6):251-5.
8. Otsubo T, Tanaka K, Koda R, Shinoda J, Sano N, Tanaka S, Aoyama H, Mimura M, Kamijima K. Reliability and validity of Japanese version of the Mini-International Neuropsychiatric Interview. 2005. *Psych and Clin Neurosci*; 59: 517–526.
9. Institute for Public Health (IPH). The Third National Health and Morbidity Survey 2006 (NHMS III), Psychiatric Morbidity, Ministry of Health Malaysia. January 2008.
10. Lecrubier Y, Sheehan D, Weiller E, Amorim P, Bonora I, Sheehan K, Janavs J, Dunbar G. The MINI International Neuropsychiatric Interview (M.I.N.I). A Short Diagnostic Structured Interview: Reliability and Validity According to the CIDI. *European Psych*. 1997; 12:224-231.
11. Amorim P, Lecrubier Y, Weiller E, Hergueta T, Sheehan D. DSM-III-R Psychotic Disorders: procedural validity of the Mini International Neuropsychiatric Interview (M.I.N.I). Concordance and causes for discordance with the CIDI. *European Psych*. 1998;

13:26-34.

12. Fleiss JL. *Statistical Methods for Rates and Proportions*, 2nd ed. John Wiley & Sons, New York, 1981.

13. Kadri N, Agoub M, Gnanoui S.E, Alami, KM, Hergueta T, Moussaoui D. Moroccan colloquial Arabic version of the MINI International Neuropsychiatric

Interview (MINI): qualitative and quantitative validation. *European Psychiatry*. 2005; 20: 193-195.

14. Marques JMA, Antonio W. Zuardi AW. Validity and applicability of the Mini International Neuropsychiatric Interview administered by family medicine residents in primary health care in Brazil. 2008. *Gen Hosp Psych*; 30: 303-310.

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