Validity and applicability of the Mini International Neuropsychiatric Interview administered by family medicine residents in primary health care in Brazil

João Mazzoncini de Azevedo Marques, M.D., Antonio W. Zuardi, Ph.D., M.D.*

Department of Neurology, Psychiatry and Medical Psychology, Ribeirão Preto Medical School, University of São Paulo, 14049-900 Ribeirão Preto, São Paulo, Brazil

Received 21 December 2007; accepted 13 February 2008

Abstract

Objective: To evaluate the validity and applicability of the Mini International Neuropsychiatric Interview (MINI) used by family medicine residents in primary health care (PHC) in Brazil.

Methods: Training for administrating the MINI was given as part of a broad psychiatry education program. Interviews were held with 120 PHC patients who were at least 15 years old. MINI was administered by 25 resident physicians, while the Structured Clinical Interview for Diagnosis (SCID) was administered by a psychiatrist blind to patients’ results on the MINI, and the diagnoses on both interviews were compared. The resident physicians answered questions on the applicability of the MINI.

Results: Concordance levels for any mental disorder, the broader current diagnostic categories and the most common specific diagnoses were analyzed. Kappa coefficients ranged between 0.65 and 0.85; sensitivity, between 0.75 and 0.92; specificity, between 0.90 and 0.99; positive predictive values (PPV), between 0.60 and 0.86; negative predictive values (NPV), between 0.92 and 0.99; and accuracy, between 0.88 and 0.98. The resident physicians considered MINI comprehensibility and clinical relevance satisfactory.

Conclusions: These good psychometric results in a real-world setting may be related to a special training program, which is more frequent, intensive and diversified. In these conditions, the MINI is a useful tool for general practitioners.

© 2008 Elsevier Inc. All rights reserved.

Keywords: MINI; Primary health care; Consultation and liaison; Validity; Applicability; Medical education

1. Introduction

Epidemiological studies on the adult population have found that prevalence for mental disorders ranges from 20% to 30% in 1 year, and 30% to 50% in a lifetime [1–3] including in Brazil [2,4]. Most people with these disorders receive treatment at primary health care (PHC) services [1,5,6]. A multicenter study performed in 14 countries, coordinated by the World Health Organization (WHO), showed that, on the average, 24% of people who attended primary care presented at least one current mental disorder, while another 9% presented clinically significant subsyndromal conditions [5,7].

Disabilities, decreased quality of life and the economic consequences associated with the presence of the most common mental disorders — such as anxiety, depression and psychoactive substance abuse — are at the least as important as those associated with common physical problems like hypertension, diabetes, arthritis, asthma or back pain [8–10].

Therefore, detecting, treating and appropriately referring people with mental disorders to specialized services are abilities necessary for PHC physicians to work effectively. Particularly regarding detection and diagnosis, studies show that general practitioners fail to detect or incorrectly diagnose about 50% of mental disorder cases presented to primary care [1,5,7,11].

Two strategies have been proposed to improve this situation: (1) improving general practitioners’ psychiatric knowledge and their diagnostic capacity through training in general interview abilities; and (2) training on how to use standardized, more structured interviews, reducing...
heterogeneity in the collection and interpretation of data from the patients’ history and exam, and, thus, facilitating concordance with the established diagnosis criteria [12,13].

Questions are raised about the first strategy due to its longer duration and training, which requires more time from specialized professionals; and the lack of guarantees, at the end of this process, that the diagnoses will be made according to the existing criteria. As to the second strategy, there is a concern with the risk of administering the structure in a way that is not sensitive to the demands of each patient care situation, thus harming the physician–patient relationship, which is essential to obtaining useful and reliable information [14,15].

In addition, studies have shown that, when PHC professionals are trained for screening, diagnosing and treating mental disorders, and the improved diagnostic services are connected to organized systems of mental care [16], there is a better chance of reaching effective outcomes. This is true for services delivered within a structured organization, with specific characteristics, for instance: patient follow-up done by the same physician, longitudinally; enough time for physicians to provide appropriate screening, diagnosis and treatment; access to specialized consultation and liaison to clarify doubts and make decisions together regarding conducts, including referring to specialized services; the possibility of following specific PHC cases together with specialized professionals; readiness and quickness to initiate specialized service treatments when indicated [17–22].

In Brazil, since 1994, the Health Ministry has proposed the Family Health Program (FHP, in Portuguese: “Programa de Saúde da Família”) as the key strategy to organize PHC and the public health care system as a whole. The FHP proposed the work of PHC teams composed of, at least, one family medicine physician, one nurse, two auxiliary nurses and four lay community health workers in each catchment area that includes 600–1000 families. These teams should perform health actions at the collective and individual levels, including health promotion, disease prevention and treatment (especially the most common ones), and constitute the prevailing contact interface between the community and the public Brazilian health care system [23–25].

Therefore, family medicine physicians are needed to implement this new model in Brazil. Furthermore, they should also effectively manage the demand related to mental health. There is a need for abilities related to screening and diagnosing mental disorders, so that these physicians can adequately meet this demand. One possible form of developing these professionals’ abilities — during specialization — would be to integrate standardized interview training in a program for practical and theoretical psychiatry training. This program would be largely performed in PHC services with the previously described structural characteristics.

Three semistructured interviews, developed in the 1990s, have been studied regarding their everyday use by general practitioners for diagnosing mental disorders: the Symptom-Drive Diagnostic System for Primary Care, the Primary Care Evaluation of Mental Disorder (PRIME-MD) and the MINI. These interviews were developed to obtain good concordance when compared to interviews administered by professionals specialized in mental health. In addition, they are sufficiently brief, of easy understanding, and readily available, and provide clinically significant data (which would not be obtained with the same quality through nonstandardized interviews), when used daily by PHC physicians [26–30].

The MINI was developed by French and North American researchers, and presented good validity in a multicenter study (performed in Europe) that compared the diagnoses by general practitioners obtained using the MINI with the diagnoses obtained by psychiatrists using nonstructured interviews. In these studies, it took 15 to 30 minutes to administrate the MINI [28–30]. It was translated into Brazilian Portuguese and there are no restrictions to its clinical and research use [31]. Until today, no studies have validated the Brazilian version of the MINI.

Hence, the purpose of the present study was to evaluate the MINI administered by family medicine resident physicians at a Brazilian PHC service.

2. Material and methods

2.1. Context of the study

In 1999, family medicine residency (FMR) activities were established at the Clinics Hospital of the University of Sao Paulo at Ribeirao Preto Medical School (FMRPUSP). The residency’s main field of clinical practice is a FHP service. Also in 1999, the FMRPUSP Psychiatry Discipline initiated collaboration with the FHP service, as well as with the FMR. One psychiatrist (one of the researchers) became the coordinator of the family medicine residency in the fields of mental health and psychiatry.

Since the beginning, consultation and liaison activities have taken place through weekly meetings with the FHP teams. The support offered to the teams, in these 90-minute meetings, has usually included discussions on specific subjects; case discussions; attending patients with FHP nurses and physicians; referring patients to psychiatric and psychotherapy follow-up at specialized mental health services. Except for emergency cases, patients are referred to specialized services only after discussing the case with the consultant. Patients who need specialized psychiatric treatment at outpatient clinical level are seen by the consultant psychiatrist.

Family medicine residency training in the fields of mental health and psychiatry has occurred over the 2-year residency program by means of scholarly and practical activities. These activities include (1) scholarly seminars — a total of forty 2-h seminars, performed during the first residency year in groups of up to 10 residents; (2) practical activities
developed at the FHP centers; and (3) practical activities developed at a psychiatric emergency service within a general emergency room.

In this context, the present study was performed with family medicine residents from four FHP service teams of the FMRFUSP and with patients seen at these services by these residents. At the time of study, these four groups covered a territory that comprised about 15,000 inhabitants.

2.2. Subjects

One hundred and twenty (120) patients, belonging to the territory covered by the four FHP center, composed the study sample. The sample displayed the same proportion of individuals described in the register of families of the four FHP center, in relation to gender and age (greater than 15 years old). In days and times chosen at random, the researcher visited health units and invited patients who were waiting for health care (following their order of arrival at the service) and met the previously determined age and gender criteria to participate in the study, until one or two individuals accepted the invitation. In order to participate in the study, the patient file could not have been previously discussed or evaluated by the researcher during consultation and liaison activities, which are routinely performed with PHC teams. This procedure was continued in order to complete the sample proportional to the persons registered in these centers. To obtain the sample, 147 patients were invited, 20 of whom declined (the main reason for not agreeing to participate was lack of time), and 7 eventually did not complete the interview with the psychiatrist. The subjects’ demographic characteristics are presented in Table 1. They were interviewed by family medicine residents, who administered the MINI, and by a psychiatrist (one of the researchers), who administered the SCID.

Table 1
Demographic characteristics of the study population

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>62</td>
<td>51.7</td>
</tr>
<tr>
<td>Men</td>
<td>58</td>
<td>48.3</td>
</tr>
<tr>
<td>Age range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–19</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>20–39</td>
<td>58</td>
<td>48.3</td>
</tr>
<tr>
<td>40–49</td>
<td>21</td>
<td>17.5</td>
</tr>
<tr>
<td>50–59</td>
<td>12</td>
<td>10.0</td>
</tr>
<tr>
<td>&gt;60</td>
<td>11</td>
<td>09.2</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohabiting</td>
<td>57</td>
<td>47.5</td>
</tr>
<tr>
<td>Single/divorced/widowed</td>
<td>63</td>
<td>52.5</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete primary level</td>
<td>30</td>
<td>25.0</td>
</tr>
<tr>
<td>Complete primary level</td>
<td>28</td>
<td>23.3</td>
</tr>
<tr>
<td>Complete or incomplete secondary level</td>
<td>51</td>
<td>42.5</td>
</tr>
<tr>
<td>Complete or incomplete higher level</td>
<td>11</td>
<td>9.2</td>
</tr>
</tbody>
</table>

Twenty-five (25) family medicine residents, who had completed MINI training, participated in the study. Each resident physician administered the MINI, in the study, between two and nine times.

2.3. Semistructured interviews

The MINI [28], translated and adapted to Portuguese [31], contains modules that evaluate various Axis I disorders of the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) [32], including major depressive episode, dysthymia, mania episode, hypomania episode, panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder, alcohol dependence or abuse, psychoactive substance dependence or abuse, anorexia and bulimia. In addition, it has modules for psychotic syndromes and risk of suicide. It can be used for systematic data collection, to establish or confirm diagnostic hypotheses in primary care, following specific criteria. A multicenter study that compared the diagnoses by general practitioners obtained using the MINI with the diagnoses obtained by psychiatrists using nonstructured interviews obtained a kappa coefficient between 0.41 and 0.68, sensitivity between 0.41 and 0.86, and specificity between 0.84 and 0.97 [28,29].

The “gold standard” diagnosis was established using the Structured Clinical Interview for DSM-IV, Clinical Version [33] (SCID), translated into Portuguese [34]. For some of the anxiety disorders, somatoform disorders and eating disorders, which in the clinical version contain only screening items, the corresponding sections of the research version were used, translated for use in Brazil [35]. The SCID is a semistructured interview that should be used by experienced professionals, specialized in clinical psychiatry, because it requires extensive knowledge in this area [36].

2.4. MINI training

Training for the MINI occurred during the scholarly seminars and practical activities performed at the primary care services. In three seminars (a total of 6 h), the Brazilian version of the MINI [31] was presented and initial training was carried out through role plays of its application, with the consultant clarifying questions. Next, in the seminars that discussed specific mental disorders, covered by the MINI, the corresponding sections of the instrument were once again presented and trained through role plays (a total of 12 h; 40 min for each section on average). When necessary, resident physicians discussed with the consultant psychiatrist specific questions they had about the MINI interviews they performed at the FHP service. Both theoretical seminars and practical activities emphasized how to integrate this standardized instrument in patient-centered care offered at primary care services, which is flexibly structured [12,37].
2.5. Training in SCID

Used as the gold standard to compare with MINI, the SCID was applied to the patients by the researcher, a psychiatrist. The researcher had previous training and experience as an interviewer in earlier studies [34].

2.6. Data collection

Patients provided written consent, and, while seeing the patient, family medicine residents administered the MINI. Next, the patient was interviewed by the researcher, who administered the SCID, at the same unit or at the patient’s home, within a week’s time. The researcher was blind to patients’ results on the MINI until the end of the data collection phase. Family medicine residents, at the end of the study, responded to a 10-item Likert questionnaire about the applicability of the MINI, with four alternative answers for each question, focused on the understanding of the instrument’s instructions by physicians and patients, the brevity of its administration, and its clinical relevance [38,39].

The research project was approved by the Research Ethics Committee at the FMRPUSP Teaching Health Center.

2.7. Data analysis

Statistical analyses were performed using the Statistical Package for Social Sciences version 13.0. 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 kappa coefficient values — which measures 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 [40]. To evaluate the predictive validity of MINI diagnoses, in relation to the SCID, calculations were made regarding sensitivity, specificity, as well as positive and negative predictive values and total accuracy, considering the presence or absence of psychiatric disorders measured by the SCID as the gold standard.

3. Results

Table 2 presents the frequencies of the broader current diagnostic categories and comorbidity according to the SCID, in absolute figures and percentages. The most common specific diagnoses were major depressive episode (19 cases, corresponding to 15.8% of the sample), generalized anxiety disorder (12 cases, 10% of the sample), panic disorder (5 cases, 4.2% of the sample) and dysthymia (4 cases, 3.3% of the sample). The most common comorbidity occurred in cases of depressive and anxiety disorders (9 cases, 7.5% of the sample).

Table 3 displays values for kappa, sensitivity, specificity, positive predictive value, negative predictive value and the accuracy of the MINI administration performed by the psychiatrists, in terms of the presence or absence of a mental disorder, and regarding the most common diagnostic categories. Concordance levels for any mental disorder, the broader current diagnostic categories and the most common specific diagnoses ranged from satisfactory to excellent (0.65 and 0.85). The results regarding validity showed high values, with sensitivity, specificity, PPV, NPV and accuracy ranging from 0.60 to 0.99.

The comprehensibility, easiness, brevity and clinical relevance of MINI use are presented in Table 4. The four answer alternatives for each question were grouped into two possibilities: evaluating the study characteristic as satisfactory or unsatisfactory. All family medicine residents considered the comprehensibility of the instrument, the easiness of using it, and its clinical relevance as satisfactory. Regarding its brevity, all family medicine residents considered the MINI unsatisfactory for application to all patients who asked for assistance at FHP center. However, the majority considered it satisfactory if it is applied only to patients previously identified as high risk for mental disorders, through screening questionnaires. No resident spent more than 30 minutes in providing the MINI.

4. Discussion

The present study found a 36.7% frequency for mental disorders. It should be emphasized, however, that this study did not aim to describe the epidemiology of mental disorders at the service under study. Thus, cases that had been previously discussed or evaluated by the researcher were systematically excluded, which could have favored the lower frequency of these disorders, when compared to previous studies performed in Brazilian PHC services, which obtained current mental disorder frequencies ranging from 38% and 56% [41–45].
Table 3
Concordance between the main current MINI and SCID diagnoses

<table>
<thead>
<tr>
<th>Diagnoses</th>
<th>SCID</th>
<th>Kappa</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Total Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M - fn</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Mental Disorder</td>
<td>68</td>
<td>08</td>
<td>0.75</td>
<td>0.86</td>
<td>0.90</td>
<td>0.83</td>
<td>0.92</td>
</tr>
<tr>
<td>Major depressive episode a</td>
<td>87</td>
<td>08</td>
<td>0.77</td>
<td>0.92</td>
<td>0.92</td>
<td>0.74</td>
<td>0.98</td>
</tr>
<tr>
<td>Anxiety Disorders</td>
<td>94</td>
<td>05</td>
<td>0.81</td>
<td>0.90</td>
<td>0.95</td>
<td>0.79</td>
<td>0.98</td>
</tr>
<tr>
<td>Substance Abuse/Dependence</td>
<td>112</td>
<td>01</td>
<td>0.85</td>
<td>0.86</td>
<td>0.99</td>
<td>0.86</td>
<td>0.99</td>
</tr>
<tr>
<td>Major Depressive Episode b</td>
<td>94</td>
<td>07</td>
<td>0.75</td>
<td>0.90</td>
<td>0.93</td>
<td>0.71</td>
<td>0.98</td>
</tr>
<tr>
<td>Generalized Anxiety Disorder</td>
<td>104</td>
<td>04</td>
<td>0.69</td>
<td>0.75</td>
<td>0.96</td>
<td>0.69</td>
<td>0.96</td>
</tr>
<tr>
<td>Panic Disorder</td>
<td>113</td>
<td>02</td>
<td>0.71c</td>
<td>0.80</td>
<td>0.98</td>
<td>0.67</td>
<td>0.99</td>
</tr>
<tr>
<td>Dysthymia</td>
<td>114</td>
<td>02</td>
<td>0.65c</td>
<td>0.75</td>
<td>0.98</td>
<td>0.60</td>
<td>0.99</td>
</tr>
<tr>
<td>Eating Disorders</td>
<td>116</td>
<td>01</td>
<td>0.66c</td>
<td>0.67</td>
<td>0.99</td>
<td>0.67</td>
<td>0.99</td>
</tr>
<tr>
<td>Psychotic Disorders d</td>
<td>119</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(a\) Depressive disorder = major depressive episode + dysthymia.
\(b\) Major depressive episode included one subject with mania in the past.
\(c\) Questionable kappa (<5% of sample).
\(d\) Only one subject.
The main finding of this study is the good psychometric characteristics of the MINI applied by family medicine residents after a special training program. Kappa coefficients, comparing MINI and SCID diagnoses, show values ranging from satisfactory to excellent (0.65 to 0.85). When comparing these results with those obtained by the original MINI development group in a European multicenter study (kappa between 0.41 and 0.68) [28,29] — comparing the diagnosis made by general practitioners administering the MINI with the diagnoses made by psychiatrists without using standardized interviews — it is observed that the present study revealed higher concordance levels. Similarly, sensitivity, specificity, PPV and NPV also present the same tendency in relation to the referred previous study [28–30,46].

When compared to validity studies performed with the SDDS-PC [26,47,48] and PRIME-MD [27,49–53], comparing the diagnoses obtained by general practitioners using these interviews with the diagnoses obtained by specialized mental health professionals (using structured interviews or not), the present study results indicate better concordance levels than those previously found.

The instrument’s good results regarding validity are probably associated with the characteristics of the training protocol. The MINI training occurred as part of a broad study program in psychiatry and mental health offered to family medicine residents and developed through theoretical and practical activities of PHC consultation and liaison. Implementing this training, which is more intensive, frequent and diversified, was probably easier in this study context, because PHC and specialized services belong to the same organization, sharing the same administration and resource management. Another factor is the emphasis on personal contact and dialogue with the FHP service teams and administrators, not only during educational actions, but also during their planning and evaluation. This made it easier for the consultant to adapt activities to the everyday needs of general practitioners [19,54–56]. In this way, the present results cannot be generalized to training models that are less intensive and use less diverse educational activities.

Regarding applicability, the present study presents results similar to those described in previous studies with the three interviews in terms of the raters’ subjective evaluation about the diagnostic instrument [26,27,49–51]. Users considered the MINI acceptable and comprehensible for general practitioners and their patients, and clinically relevant (i.e., providing information that would otherwise not be obtained without the instrument). However, they considered that the introduction of the MINI in the daily routine would be viable if the application occurred only in patients at risk of mental illness, previously selected by a screening questionnaire for easy and rapid implementation.

This study has important limitations. Only one psychiatrist performed interviews in which the SCID was administered, and that professional was the same one who trained the resident physicians in the MINI. However, the psychiatrist was blind to the diagnoses obtained by administering the MINI until the end of the data collection phase. Hence, it is unlikely that the expectation of a good result from the training affected the obtained data. It is also possible that the same diagnostic error occurred systematically in both interviews. However, that error is also unlikely because the professional’s initial SCID training involved group interviews, with other specialized professionals, with appropriate inter-rater reliability [34].

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 general practitioners working in PHC. This result presupposes training incorporated into multifaceted learning strategies within the everyday work of PHC physicians, including during consultation and liaison activities, which, potentially, could be developed either during their residency or during later continuing education programs — similar to what frequently occurs with other countries and is now starting in Brazil [12–22,57–59].

### References


health organization world mental health surveys. JAMA 2004;291: 2581–90.


