THE COMPOSITE INTERNATIONAL DIAGNOSTIC INTERVIEW (CIDI): ITS RELIABILITY AND APPLICABILITY IN A RURAL COMMUNITY OF NORTHERN INDIA

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ABSTRACT

To study the reliability and applicability of the Composite International Diagnostic Interview (CIDI) in a rural community of India, a two steps sampling procedure was adopted, Step I: A clinical diagnosis based on the Diagnostic and Statistical Manual of Mental Disorder-Ill-Revised (DSM-III-R) criteria was administered to 218 persons aged 18-60 years who consulted the Primary Health Centre (PHC); Step II: Of these persons, 71 were selected for detailed examination with the CIDI Hindi version in their home environment. The current diagnoses produced by the CIDI (scored two ways DSM-III-R and ICD-10) were evaluated against the DSM-III-R clinical diagnoses. The kappa values were 0.43 and 0.64. The likelihood ratios of positive CIDI-DSM-III-R and CIDI-ICD-10 were found to be 13.11 and 17.23; the specificity rates were 95.4% in each; the positive predictive values were 96.6% and 97.4% and the sensitivity rates were 59.2% and 77.5%. A significant longer time was taken for coding one CIDI. Only 8% of the 71 CIDI interviewed required more than one sitting. 96% of those interviewed were receptive for future interviews with CIDI. The study findings emphasize the good reliability and acceptability of the CIDI in a rural community of India.

Key words: Composite International Diagnostic Interview (CIDI), rural community, reliability, mental morbidity

The cross-cultural prevalence, presentation and diagnosis of mental disorders are of substantial clinical and theoretical interest but the availability of qualified psychiatrists for the epidemiological studies in mental health is difficult in most of the developing countries. Even if the psychiatrist is available these studies cannot avoid variations due to observer, diagnostic criteria, culture and region. The CIDI is the one of the psychiatric diagnostic instruments which is fully standardized, comprehensive, concise and suitable for cross cultural epidemiological and comparative studies (Robins et al., 1989). The CIDI gives diagnosis based on defined criteria of the International Classification of Diseases, tenth edition (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders, third revision (DSM-III-R) with high validity and reliability (Wittchen et al., 1989 & 1990; Semler et al., 1987 & 1988). But the CIDI is not evaluated extensively in rural areas. In a country like India, around 75% of the population living in rural areas, majority of mentally ill patients also are in these areas. In fact, more patients with mental disorders are cared for in the primary care sector than in the specialized mental health sector (Jugal Kishore et al., 1996; Sartorius et al., 1993). However, many studies have consistently shown that 50% to 75% of patients suffering from mental disorders are missed for diagnosis and treatment by the primary health physicians (Kessler et
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al., 1985; Orme et al., 1991; Harding et al., 1980). Could the diagnostic tool CIDI be utilized to establish the mental morbidity? In this article the reliability and applicability of the ICD in a rural community is being described.

MATERIAL AND METHOD

Study Area

This study was conducted in the head quarter village of Primary Health Centre (PHC) Chhainsa of Haryana, India. It is one of the two PHCs functioning under Comprehensive Rural Health Service Project, Ballabgarh of All India Institute of Medical Sciences, New Delhi (AIIMS).

Study Design

The sampling procedure is completed in two steps (Figure).

FIGURE: FLOW CHART OF SAMPLING PROCEDURE

| Step I: The Diagnostic and Statistical Manual of Mental Disorders 3rd revision (DSM-III-R) clinical diagnosis (APA, 1987): A representative sample of 218 from the total of 1788 adult subjects who attended PHC was selected for clinical diagnosis with the help of DSM-III-R (table 1). Remaining adult subjects (1570) were excluded because they were antenatal, postnatal, seriously ill (as their present condition might have interfered with clinical and CIDI evaluation) or coming from outside village Chhainsa (where home visit could have been difficult). On an average the first three to four patients coming to PHC every day of total 60 working days over a period of 6 months were assessed by taking psychiatric history and mental state examination. Diagnosis was made with the help of pocket book of DSM-III-R criteria and each positive subject was discussed and 5% of

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE, OPD ATTENDERS AND POPULATION OF VILLAGE CHHAINSA

| Sex   | Male | 48.0 | 42.0 | 53.5 |
|-------|------|------|------|------|
| Female| 52.0 | 58.0 | 46.5 |
| Age in years | 18-24 | 35.0 | 31.0 | 39.0 |
| 25-34 | 28.0 | 32.0 | 22.5 |
| 35-44 | 19.0 | 15.0 | 20.0 |
| 45-54 | 12.0 | 12.0 | 13.0 |
| 55-60 | 6.0  | 10.0 | 5.5  |
| Marital Status
  Unmarried | 17.0 | 21.0 |
  Married   | 79.0 | 72.0 |
  Widow/separated | 5.0  | 7.0  |
| Socioeconomic Class
  Lower    | 7.3  | 9.8  |
  Lower Middle | 44.5 | 43.8 |
  Middle   | 38.1 | 38.1 |
  Upper M. class | 9.6  | 8.5  |
  Upper class | 0.5  | 0.0  |

*According to Parikh & Trivedi, Scale (1996).
the positive and negative subjects were independently assessed by a psychiatrist (VK). There were following selection criteria a) only new adult subjects (18-60 years) were taken so that repetition could be avoided; b) subjects belonging to village Chhainsa so that house visit could easily be carried out for detailed evaluation with CIDI and follow up visit for further management;

From each patient an informed oral consent was obtained before inclusion in the study. Socioeconomic status was also scored on Parikh and Trivedi scale (1966).

Step II : The Composite International Diagnostic Interview (CIDI) diagnosis : 60% (N=52) of the total 87 DSM-III-R positive patients (two subjects with personality disorders and two subjects with sexual disorders were excluded because these categories were not available in the CIDI manual) were assessed with CIDI. 20% (N=25) of the total 127 DSM-III-R negative subjects were also assessed with CIDI. This assessment was tried within a week of step I procedure. Inspite of three visits at their home, two DSM-III-R positive and three DSM-III-R negative subjects were unable to be interviewed. Either their addresses were wrong or their houses were found locked. One DSM-III-R positive subject was not interviewed with the ICD completely because she left for her parents' house and didn't return till the study was completed. Six interviews with the CIDI were coded in more than single sitting.

Analysis : The CIDI data was used to assign ICD-10 and DSM-III-R mental diagnoses according to well-defined computerized diagnostic algorithms. Completed CIDIs were reviewed by a psychiatrist who was not aware of clinical diagnosis made with the help of DSM-III-R pocket book and miscoding errors were eliminated. Only current mentally ill patients according to CIDI DSM-III-R and CIDI ICD-10 were taken for analysis. Validity indices were calculated considering DSM-III-R Clinical Diagnosis as a gold standard because it is well accepted method. The diagnostic agreement between DSM-III-R clinical and CIDI diagnoses was assessed and kappa values were calculated (Fleiss, 1981).

Hindi Translation of the CIDI: Hindi translation of the CIDI was mandatory before applying the CIDI on Hindi speaking people because there was no such translation available at that time. It was essential for avoiding intra-observer bias because on spot translation there may be variation in the concept and may require more time for coding each selected individual. In the process of Hindi translation, the first step was to translate English version to Hindi by two non-medical bilingual persons. In second step, Hindi translation was translated back into English by medical person and compared with original English version. This English translation was again translated into Hindi with the help of a Hindi expert keeping all concepts intact. This Hindi translation was applied on ten local Hindi speaking patients and any difficulty was removed with the help of senior psychiatrist before preparing the final Hindi translation of the CIDI.

Training in CIDI and Psychiatry: As recommended by the WHO for the use of CIDI in fields, a special training course was received by the resident of community medicine from the National Institute of Mental Health & Neurosciences, Bangalore. The resident was already trained in basic psychiatry during his under-graduation. Beside this two months special training in psychiatry was taken in the Department of Psychiatry, All India Institute of Medical Sciences, New Delhi.

RESULTS

There were more female subjects (52%) attending PHC; 78% of the study group was married and 54% was living in nuclear families. Literacy rate in the study group was 50% but in illiterate group, 80% were females; 35% of the study subjects were in the age group of 18-24 years and 28% were in the age group of 25-34 years (Table 1). Mental Morbidity (Jugal Kishore
et al., 1996) : Pure mental morbidity among 218
subjects according to DSM-III-R criteria at the
rural PHC was 21.5%. Comorbidity with physical
illness was 22.2% so the total mental morbidity
in the study sample was 41.7%. The common
mental disorders were mood disorders (28.6%) and
somatoform disorders (27.4%).

The subsample of 71 subjects for CIDI
evaluation was fairly representative of the whole
study group (Table 1). Percentage agreements
between clinical diagnosis and CIDI-DSM-III-R
and CIDI-ICD-10 were 63.3% and 71.83% (Table
2 & 3). Agreement beyond chance between
CIDI-DSM-III-R and clinical diagnosis was scored
intermediate (Kappa=0.43) but it was good
(Kappa=0.64) when CIDI-ICD-10 and clinical
diagnosis were compared.

Diagnostic criteria for sexual disorders and
personality disorders are not given in CIDI
module and that is the main reason for exclusion
of these categories while comparing. There were
high agreements for mood disorders and anxiety
disorders. Mental retardation is over-rated by the
CIDI that may be due to the low literacy among
patients. Among 71 patients, 49 (69%) were
clinically diagnosed as mentally ill. The CIDI-
DSM-III-R identified 28 (57%) from 49 patients
whereas the CIDI-ICD-10 identified 39 (79.5%)
patients. The validity of CIDI can be described
by 2x2 table (Table 4 & 5). Positive predictive
value (PPV) of the CIDI-DSM-III-R was very high
(96.5%), similarly for the CIDI-ICD-10 it was
97.5%. The sensitivity was low (57% for CIDI-
DSM-III-R and 79.6% for CIDI-ICD-10) but still
it could be accepted for the instrument because
it is recommended for diagnostic purpose. Only
6 (8%) CIDI were completed in more than one
session. The average time taken for completion
of one CIDI was 110.56 minutes which is
significantly longer than 75 minutes as described
by WHO(1990) (t=8.68, p<0.05). None of the
patient refused CIDI. When they were asked for
their willingness to undergo future interview, out
of 71, 68(96%) of the subjects were receptive.

**DISCUSSION**

Although mental disorders have been
found to be common in primary health care setting
(Jugal Kishore et al., 1996; Srinivasan et al., 1990),
all too often they go unrecognized and untreated
(Kessler et al., 1985; Harding et al., 1980).
Realizing the importance of mental health in
primary health care setting, the National Mental
Health Programme in India (1982-88) is now
aimed at training the non-psychiatrist physician

**TABLE 2**

**AGREEMENT BETWEEN CIDI-DSM-III-R AND DSM-III-R CLINICAL DIAGNOSIS**

| DSM-III-R Clinical | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Total |
|-------------------|---|---|---|---|---|---|---|---|---|-------|
| CIDI-DSM-III-R    | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5     |
|                   | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |
|                   | 3 | 0 | 0 | 16| 0 | 0 | 0 | 0 | 0 | 3     |
|                   | 4 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1     |
|                   | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |
|                   | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |
|                   | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |
|                   | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |
|                   | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1     |

| Total             | 1 | 1 | 23| 1 | 0 | 0 | 2 | 1 | 2 | 71    |

1. Substance use disorders, 2. Schizophrenia,
3. Mood disorders, 4. Anxiety disorders,
5. Adjustment disorders, 6. Dissociation disorders,
7. Somatoform disorders, 8. Mental retardation
9. Negatives

*Percentage agreement = 59.7%

**Kappa = 0.43**

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**TABLE 3**

**AGREEMENT BETWEEN CIDI-ICD-10 AND DSM-III-R CLINICAL DIAGNOSIS**

| DSM-III-R Clinical | CIDI-ICD-10 |
|--------------------|-------------|
| 1                  | 2 0 0 0 0 0 0 0 3 5 |
| 2                  | 0 1 0 0 0 0 0 1 1 1 |
| 3                  | 0 0 2 0 0 0 0 0 1 5 |
| 4                  | 0 1 0 0 0 0 0 0 1 5 |
| 5                  | 0 0 0 0 0 0 0 0 1 5 |
| 6                  | 0 0 0 0 0 0 0 0 1 5 |
| 7                  | 0 0 0 0 0 0 0 0 1 5 |
| 8                  | 0 0 0 0 0 0 0 0 1 5 |
| 9                  | 0 0 0 0 0 0 0 0 1 5 |
| **Total**          | 1 2 3 4 5 6 7 8 9 |

1. Substance use disorders, 2. Schizophrenia,
3. Mood disorders, 4. Anxiety disorders,
5. Adjustment disorders, 6. Dissociation disorders,
7. Somatoform disorders, 8. Mental retardation
9. Negatives
* Percentage agreement = 73.23%
** Kappa = 0.64

**TABLE 4**

**VALIDITY INDICES OF CIDI-DSM-III-R AGAINST DSM-III-R CLINICAL DIAGNOSIS**

| CIDI DSM-III-R Clinical Diagnosis | Total |
|----------------------------------|-------|
| +                                | 28 1 29 |
| -                                | 20 21 41 |
| **Total**                        | 49 22 71 |

- Sensitivity = 59.2%
- Specificity = 94.6%
- Positive Predictive value = 96.6%
- Negative Predictive value = 51.2%
- Likelihood Ratio of + Test = 13.11
- False Positive of CIDI-DSM-III-R = 4.5%
- False Negative of CIDI-DSM-III-R = 40.8%

High specificity and positive predictive values of the CIDI in our analysis are supporting the previous documentation of high validity in other different setting (Farmer et al., 1987; Wittchen et al., 1989; Semler et al., 1988).

The inter-observer agreement of two procedures but similar criteria (DSM-III-R clinical diagnosis and CIDI-DSM-III-R) except CIDI-ICD-10 in our study was fairly good (Kappa 0.43 and 0.64) but still lower than the findings of Wittchen et al. (1991) who have reported very high reliability of the CIDI in a multinational study.

There are many explanations for the fairly good but not very good agreement co-efficient.
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of the CIDI observed in our study:

a) Two different settings (PHC and home) were
used for the detailed interviews that might
have affected the responses, unlike the
responses obtained in the same room;
b) There was an interval of up to one week
between the clinical interview and the CIDI
coding which might have been the possible
source of variance occurring because of a
change of the patients psychopathological
state;
c) Adequate literacy of the respondent is
prerequisite for completing the section "M"
(assessment of cognitive impairment) but our
50% of the patients were illiterate and 80%
among them were females that might have
affected the respondent capacity to complete
section "M". There is a need to improve this
section for rural and illiterate population.

In the present study, a good applicability
and acceptance of the CIDI in rural community
was detected as we have completed 71 out of
77 interviewees with a response rate of 92.2%. Except six (8%) all the CIDI's were completed in
a single testing. A majority of the interviewers
were receptive to possible future interviews.
Many of the interviewers said that no time in
their life before, had such a detail history of their
illness been interrogated. Similar good
acceptance has been reported though the length
of the CIDI was criticised (Farmer et al., 1987;
Wittchen et al., 1991).

A very good acceptance of the CIDI by
the patients may be because of following
reasons: 1) it might be difficult for an interviewee
to refuse a doctor at home because in rural areas,
doctors are most respectable and visiting home
for a long interview is uncommon. 2) The CIDI
have diversity of questions that might have
generated curiosity in the interviewee who gave
responses confidently and seriously till the very
last question. 3) Rural people have plenty of time
if it is not a harvest season.

A significant amount of time was devoted
for the coding of each CIDI (Average time
110.56±34 minutes) which could be explained:

1) A large proportion (50%) of the CIDI
interviewees were illiterate. For them the CIDI
questions had been repeatedly read; 2) six CIDI
interviews were completed in two or three
testings which needed reorientation of
interviewer and respondents each time. Some
of the sections could be reduced for example,
somatoform disorders, depression, alcohol and
drug abuse and dependency section. Similar
recommendations were suggested by Wittchen
et al.(1991).

Limitation

The resident of community medicine was
not blind to the clinical diagnoses already made
by DSM-III-R criteria in the PHC while coding
on CIDI in the field, but the CIDI is a
comprehensive and fully structured interview
schedule that should not be influenced by
diagnostic bias.

The high predictive values of the CIDI is
expected because proportionally more DSM-III-
R clinically positive (60%) were selected for the
CIDI evaluation. As we know that the predictive
values of the test is getting affected by the
prevalence of disease. To avoid recall bias life
time history of mental disorders was not taken at
the time of clinical evaluation. Although the CIDI
provide life time prevalence of mental disorders
but it could not be compared with current clinical
diagnosis based on DSM-III-R criteria.

Another problem with recall is that some
of the mental illnesses for example depression
and anxiety, are not perceived as significant
mental illness by the community that could be
missed by patient recall of their mental illness.

A rural primary health care physician can
administer the CIDI easily but requires training
and if possible availability of a computer. Policy
makers should give an adequate attention for
the computerisation of primary health care
system, not only for better data keeping and
administration but also to provide better health
services to the community.

Some of the difficulties encountered while
using and translating English version of CIDI into
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