

# A Hindi Version of the Diagnostic Interview for Genetic Studies

by Smita N. Deshpande, Mohit N.L. Mathur, Shri K. Das, Triptish Bhatia, Shridhar Sharma, and Vishwajit L. Nimgaonkar

## Abstract

The validity of a Hindi version of the Diagnostic Interview for Genetic Studies (DIGS) was investigated. The original English version was initially translated into Hindi. The Hindi version was then back-translated and compared with the original. Next, a group of psychiatric inpatients and outpatients were interviewed using the Hindi version. The resultant diagnoses were compared with those obtained for the same patients using a Hindi version of the Present State Examination (PSE), and the clinical diagnoses given by the treating psychiatrists. The DIGS diagnoses were significantly correlated with both the PSE diagnoses (Cohen's kappa = 0.80) and the clinical diagnoses (kappa = 0.56). Interrater reliability between three interviewers for diagnoses obtained using the Hindi version of the DIGS varied (kappa = 0.45–1.00). Possible causes for this variability are discussed. The Hindi version of the DIGS fulfills the need for a current comprehensive interview schedule not only for psychiatric genetic research in India, but also for non-genetic research.

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Because family, twin, and adoption studies suggest a significant genetic predisposition to psychotic illnesses (Gottesman 1991), a worldwide effort to identify etiological genetic factors is under way. Such studies require careful characterization of phenotype (Levinson and Mowry 1991). To this aim, investigators collaborating with the National Institute of Mental Health (NIMH) Genetic Initiative developed the Diagnostic Interview for Genetic Studies (DIGS; Nurnberger et al. 1994), a structured interview schedule specifically designed for psychiatric genetic studies. It enables a careful assessment of major mood and psychotic disorders, as well as their spectrum conditions.

In addition, the course of illness, the chronology of target symptoms, and comorbidity can be assessed. Information from the DIGS can also be used in OPCRIT, a computerized polydiagnostic program (McGuffin et al. 1991). The reliability of the DIGS was investigated as part of a multi-institutional study (Nurnberger et al. 1994). A second version of the DIGS has now been developed (D. Wynne, NIMH, personal communication, January 1995). The DIGS has been translated into several languages, but to our knowledge, the diagnostic validity of these versions has not been published.

Current psychiatric genetic initiatives are largely confined to populations of Caucasian descent. Studies involving other large ethnic groups are infrequent. In particular, few such studies have been conducted in the Indian subcontinent, although epidemiological studies have shown that the clinical presentation, prevalence, incidence, and lifetime morbid risk of schizophrenia are similar to those in the West (Jablensky et al. 1992). Thus, a study at Chandigarh in Northern India estimated annual incidence rates of 3.8 to 4.4 out of 10,000 people, while another study in Madras in South India estimated rates of 2.1 to 4.1 out of 10,000 people (Rajkumar et al. 1993; Wig et al. 1993). It is interesting to note that a multinational study has suggested the outcome of schizophrenia to be better in a rural Indian setting than in developed countries (Jablensky et al. 1992). The difference has been attributed to sociological factors, but could well be due to inherited traits.

Research into schizophrenia in India has mainly focused on phenomenology, epidemiology, and clinical trials using antipsychotic drugs (Kulhara and Wig 1978; Murthy 1992; Tharyan and Kuruvilla 1994). Research in other areas, such as genetics, is sparse. Indeed, the

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Reprint requests should be sent to Dr. V.L. Nimgaonkar, Western Psychiatric Institute and Clinic, Rm. 993, 3811 O'Hara St., Pittsburgh, PA 15213.

authors' survey of publications in the *Indian Journal of Psychiatry* over the past 5 years revealed less than five such publications. Notably, a family history study of 102 patients with schizophrenia did not reveal excess consanguinity and suggested a polygenic mode of inheritance (Ponnudurai 1989). An earlier study of eight families multiply affected with schizophrenia did not find significant evidence for linking the illness with the Human Lymphocytic Antigen locus (Chaddha et al. 1986).

The paucity of scientific investigation into the etiology of schizophrenia highlights the neglected state of this field in India. The absence of adequate psychiatric interview schedules in Indian languages may be partly to blame. Although an early version of the Present State Examination (PSE; Wing et al. 1974) was translated into Hindi over a decade ago (Wig et al. 1982), a translation of the most recent version is not available. Moreover, this semistructured questionnaire does not include questions related to "spectrum conditions" such as schizotypal personality disorder and hypomania. A similar deficiency exists in the Hindi version of the General Health Questionnaire (Goldberg 1978). To enable psychiatric genetic studies in India, the second version of the DIGS was translated into Hindi. This article examines its diagnostic reliability.

## Methods

Following consultations with linguists and clinicians, the English version of the DIGS (version 2) was translated into Hindi. The Hindi translation was then back-translated by individuals who had not been involved in the initial translation. The back-translated version was virtually identical to the original English version, except for a few minor discrepancies, which were corrected. The Hindi version was next administered to psychiatric outpatients ( $n = 5$ ), who were asked to identify questions they did not understand. Those questions were suitably altered and the back-translation checked again.

Next, the diagnostic reliability of the Hindi DIGS was compared with the Hindi version of the PSE (Wig et al. 1982) and with unstructured clinical interviews. The PSE was originally designed to assess symptoms occurring over the 1-month period preceding the interview, whereas the DIGS provides information about both the present state and lifetime occurrence of symptoms. To make the two interview schedules compatible, the time-frame for each symptom in the PSE was modified to assess its lifetime occurrence.

A group of consenting inpatients ( $n = 10$ ) and outpatients ( $n = 10$ ) receiving psychiatric treatment were interviewed. Both men and women from all religious groups

were included. Preference was given to patients with psychotic symptoms, since the DIGS was originally designed for research into psychoses. The Hindi versions of the DIGS and the PSE were administered to each participant at 1-week intervals. If possible, corroborating information was sought from relatives and then supplemented by hospital case notes. The sample was divided equally between those who received the DIGS first and those who were first administered the PSE. Following each interview, diagnoses based on *DSM-IV* (American Psychiatric Association 1994) criteria were assigned by the interviewer. These diagnoses were based on the respective interviews, combined with the information available from the patient's clinical notes. The clinical diagnosis made by the treating psychiatrist was also noted in each case. Such diagnoses are based on ICD-9 (World Health Organization 1978) criteria following unstructured interviews. Thus, each patient received three diagnoses: the clinical diagnosis and those based on the DIGS and the PSE. The correlations between the three sets of diagnoses were examined.

Finally, interrater reliability for the DIGS-based diagnoses was examined among three of the authors. Dr. Deshpande (rater 1), a psychiatrist, and Dr. Bhatia (rater 2), a clinical psychologist, were trained in India, whereas Dr. Nimgaonkar (rater 3) received his psychiatric training in the United Kingdom and the United States. Over a 2-week period, both Dr. Deshpande and Dr. Bhatia received intensive training in the DIGS, using mock interviews with Dr. Nimgaonkar, as well as interviews with patients. Following the training, patients were interviewed by one of the clinicians, with either one or both of the other two observing. Following the interview, each clinician assigned a diagnosis. These diagnoses were used to test interrater reliability. At the end of the session, any diagnostic differences were discussed and consensus diagnoses assigned. Correlations were examined using Cohen's kappa (Cohen 1960). The computerized Statistical Package for Social Sciences (SPSS; Norusis 1992) was used for all analyses.

## Results

Demographic details and diagnoses for each participant are presented in table 1. There were 12 men and 8 women, with a median age of 37 years (range 19–86). The clinical diagnoses in this sample included schizophrenia ( $n = 10$ ), bipolar disorder ( $n = 5$ ), schizoaffective disorder ( $n = 2$ ), psychosis not otherwise specified ( $n = 1$ ), major depressive disorder ( $n = 1$ ), cannabis abuse ( $n = 1$ ), and generalized anxiety disorder ( $n = 1$ ). Using the DIGS and the PSE, four additional diagnoses (substance-induced mood

**Table 1. Demographic features and diagnoses of study participants**

No.	Age	Gender	Clinical	Diagnoses	
				DIGS	PSE
1	19	Male	Schizoaffective (D)	Schizoaffective (D)	Schizoaffective (D)
2	23	Female	Schizophrenia	Schizophrenia	Schizophrenia
3	42	Female	Schizophrenia	Schizophrenia	Psychosis, NOS
4	31	Male	Bipolar disorder	Bipolar disorder	Bipolar disorder
5	23	Male	Schizophrenia	Schizophrenia	Schizophrenia
6	33	Male	Bipolar disorder	Bipolar disorder, Alcohol dependence	Bipolar disorder
7	57	Male	Bipolar disorder	Bipolar disorder	Bipolar disorder
8	20	Female	Psychosis, NOS	Schizophrenia	Schizophrenia
9	48	Male	Schizophrenia	Schizophrenia	Schizophrenia
10	29	Female	Schizophrenia	Schizophrenia	Schizophrenia
11	38	Female	Bipolar disorder	Bipolar disorder	Bipolar disorder
12	39	Male	Schizophrenia, Can. Ab.	Sub. Ind. Mood Dis., Coc. Dep., Can. Ab.	Sub. Ind. Mood Dis., Coc. Dep., Can. Ab.
13	49	Male	Schizophrenia	Schizophrenia	Schizophrenia
14	53	Female	Schizoaffective (D)	MDD, psychotic	MDD, psychotic
15	54	Female	Schizophrenia	Schizophrenia	Schizophrenia
16	86	Female	Bipolar disorder	Bipolar disorder	Bipolar disorder
17	36	Male	Schizophrenia	Schizophrenia	Schizophrenia
18	34	Male	GAD, MDD	MDD, SP	GAD
19	38	Male	MDD, psychotic	Schizoaffective (D)	MDD, psychotic
20	23	Male	Schizophrenia	Schizophreniform	Schizophreniform

*Note.*—Schizoaffective (D) = schizoaffective disorder, depressed; NOS = not otherwise specified; Sub. Ind. Mood Dis. = substance-induced mood disorder; Coc. Dep. = cocaine dependence; Can. Ab. = cannabis abuse; MDD = major depressive disorder; GAD = generalized anxiety disorder; SP = social phobia; PSE = Present State Examination (Hindi version; Wig et al. 1982); DIGS = Diagnostic Interview for Genetic Studies (Numberger et al. 1994).

disorder, alcohol dependence, cocaine dependence, and social phobia) were made.

There was a highly significant correlation between the diagnoses obtained with the DIGS and the PSE (Cohen's kappa = 0.80; table 2). The correlation between the DIGS diagnoses and the clinical diagnoses was weaker, but still significant (kappa = 0.56). The correlation coefficient for the PSE diagnoses and the clinical diagnoses was more highly significant (kappa = 0.64).

The interrater reliability for diagnoses using the DIGS also varied (table 2, rater 1 vs. rater 2: kappa = 1.0,  $n = 5$ ; rater 1 vs. rater 3: kappa = 0.45,  $n = 6$ ; rater 3 vs. rater 2: kappa = 0.55,  $n = 6$ ). In all cases, discussions between the raters helped resolve the inconsistencies.

## Discussion

To our knowledge, the Hindi version of the DIGS is the most comprehensive modern structured psychiatric questionnaire presently available in Hindi. Compared with the PSE, a highly significant correlation in diagnoses was noted. The DIGS diagnoses were also in significant agreement with the clinical diagnoses, although the correlation was of a lower magnitude. The discrepancies may have

**Table 2. Diagnostic correlations**

Comparison	<i>n</i>	kappa
<b>Between interview schedules</b>		
DIGS vs. clinical diagnosis	20	0.56
DIGS vs. PSE	20	0.80
PSE vs. clinical diagnosis	20	0.64
<b>Interrater reliability</b>		
Rater 1 vs. rater 2	6	1.0
Rater 1 vs. rater 3	6	0.45
Rater 3 vs. rater 2	5	0.55

*Note.*—DIGS = Diagnostic Interview for Genetic Studies (Numberger et al. 1994); PSE = Present State Examination (Hindi version; Wig et al. 1982).

arisen because the clinical diagnoses were made following relatively brief unstructured interviews and were based on ICD-9 criteria. In support, the correlation between the PSE diagnoses and the clinical diagnoses was similar to that between the latter and the DIGS diagnoses. The present studies validate the applicability of the Hindi DIGS in an Indian clinical setting.

The analysis of the correlations belies the amount of clinical information obtained with the DIGS, which was well in excess of that obtained by the treating clinicians or

following the PSE. For example, additional diagnoses were made on two of the participants (#6, #18, table 1). A DIGS interview revealed that participant #6 clearly suffered from alcohol dependence in addition to bipolar disorder. Similarly, a further diagnosis of social phobia was made for individual #18. These diagnoses were made possible by the systematic nature of the DIGS, which provides information in relation to specific episodes. Thus, the temporal relationship between individual episodes can be dissected, and diagnoses for such episodes can be made unambiguously. This was especially helpful with individuals suffering from psychotic phenomena as well as affective disturbances.

The additional information obtained using the DIGS entailed a longer interview. The DIGS interviews lasted 2 to 3 hours, whereas the PSE required 1 to 2 hours. It was initially thought that the longer interview time would be impractical, but judiciously spaced breaks enabled complete interviews with even the most disturbed patients. It was also feared that the elaborate requirements for the delineation of specific episodes might be difficult in the Indian setting, but appropriate temporal cues made it possible to identify and delineate episodic psychopathology.

Shortening the interview further by judiciously eliminating some questions may also be possible. For example, most of the population has not served in the armed forces, so the questions relating to veteran status appear less relevant in the Indian context. Most patients did not understand the questions on the past history of medical conditions such as Huntington's chorea and multiple sclerosis. Other questions were misunderstood: For example, the question related to parental ethnic origins was often misconstrued as an inquiry into the respondents' caste—a sensitive issue for many.

The validity of the sections of the Hindi DIGS related to schizotypal personality disorder, anorexia nervosa, and pathological gambling could not be explored. The prevalence of these particular conditions in India is unknown. They are rarely noted in general psychiatric clinics. Another concern was the possible difficulty in correctly diagnosing depression presenting primarily as somatic symptoms (Kleinman 1977). Although such cases were not encountered in the present study, this may be attributable to its relatively small sample size. The usefulness of the DIGS in identifying such cases requires further investigation. Similarly, the small number of cases with schizoaffective disorder in the present study precludes comment on the reliability of the Hindi DIGS for this disorder. The English version has been reported to be less reliable for cases with this disorder, as compared with other psychoses (Nurnberger et al. 1994). If *DSM-III-R* (American Psychiatric Association 1987) diagnoses are used, the schizoaffective disorders are primarily confused

with schizophrenia (Faraone et al. 1996). However, clinical differentiation is feasible if specific clinical variables are used (Blehar et al. 1995/1996).

Interrater reliability among the three raters was also tested. Agreement between two of the interviewers was perfect, but concordance with the third was less satisfactory. The lower values could be attributable to the small samples or to the relatively short training period. Alternatively, they could be due to differences in training: The perfect agreement occurred between the raters trained in India, while their correlations with the psychiatrist trained outside India were less satisfactory. Such differences emphasize the need for thorough training and reliability exercises when the DIGS is used in a culturally novel setting. They also emphasize the need for consensus diagnoses, since the interrater differences were successfully resolved during the discussion following each interview.

In summary, compared with unstructured clinical interviews, as well as the PSE, the Hindi version of the DIGS provided sufficient information to enable satisfactory diagnoses. The DIGS interview yielded more clinical information than either the case notes or the PSE interview. Interrater reliability varied, but diagnostic differences between raters could be resolved and consensus diagnoses reached. The Hindi DIGS schedule is available from the authors on request. The Family Interview for Genetic Studies, a semistructured questionnaire designed to elicit family history of psychiatric illness, has also been translated into Hindi. An investigation of its validity is in progress.

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## The Authors

Smita N. Deshpande, M.D., D.P.M., is Consultant Psychiatrist; Mohit N.L. Mathur, Ph.D., is Senior Psychologist; Shri K. Das, Ph.D., is Senior Psychologist, Dr. Ram Manohar Lohia Hospital, New Delhi, India. Triptish Bhatia, Ph.D., is Research Associate, Indo-US Collaborative Study of Schizophrenia Genetics, New Delhi, India. Shridhar Sharma, M.D., D.P.M., F.R.C.Psych., is Professor of Psychiatry and Director, Institute for Human Behavior and Allied Sciences, Shahadara, New Delhi, India. Vishwajit L. Nimgaonkar, M.D., Ph.D., is Associate Professor, Department of Psychiatry, Western Psychiatric Institute and Clinic, University of Pittsburgh, School of Medicine and Department of Human Genetics, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA.

