

REVIEW ARTICLE

Child and Adolescent Psychiatric Epidemiology in India

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ABSTRACT

The increasing focus on child mental health in developing countries like India points to the importance of epidemiological data in developing training, service and research paradigms. This review attempts to synthesise and evaluate the available research on the prevalence of child and adolescent psychiatric disorders in India and highlight significant conceptual and methodological trends. It identified 55 epidemiological studies conducted between 1964 and 2002 in the community and school settings. Despite considerable progress, various methodological lacunae continue to limit the value of the epidemiological surveys. These include issues related to sampling, case definition methods, tools, multi-informant data and data analysis. The importance of a socio-culturally relevant research framework has been highlighted. The review suggests directions for future research to guide planning of services that meet the mental health needs of vulnerable children and adolescents

Key words: adolescent; children; epidemiology, prevalence; psychiatric disorders

India has among the world's highest population density and population growth figures, with children constituting almost 37% of the population. Epidemiological research can provide reliable prevalence estimates to inform service planning and resource allocation for this vulnerable group. Indian studies have been conducted in community and school settings, with substantial progress in the last decade. However, comparisons across studies are difficult because of variations in sample characteristics, source of information, method of elicitation and case definition. This review aims to provide a critique of earlier studies, highlight distinctive trends and directions for future research.

COMMUNITY BASED STUDIES

Twenty one community-based studies, conducted over a period from 1964 to 2001, were identified (Table I). Most early studies included children in the adult populations,

with many reporting only total prevalence rates. Often, the tools used were unsuitable for assessing disorders specific to children and adolescents. Table I indicates that the total prevalence rate ranged from 0.48% to 29.40%.

Most Indian studies report lower psychiatric morbidity than large-scale studies from other countries. A mean prevalence rate of 29% is found in studies from France, Germany, New Zealand, Puerto Rico, USA., Canada and the Netherlands. More recently, the prevalence rates from other countries continue to be higher than India: For example, Switzerland - 22.5% for 7-16 year olds (Steinhausen et al, 1998); USA — 21.0% for 9-17 year olds (Shaffer et al 1996); and Ethiopia — 17.7% for 5-15 year olds (Tadesse et al. 1999). This difference may not necessarily imply truly lower rates of psychiatric disorders in Indian children and adolescents. Other reasons could include poor awareness and psychological sophistication leading to lower sensitivity to

certain disorders, higher threshold of tolerance for certain symptoms and other socio-cultural factors. The number of affected children and adolescents is still staggering, given India's total population figures.

Mental retardation, epilepsy and enuresis are the priority disorders, with the highest reported prevalence rates. Internalising disorders like anxiety, depressive and obsessive compulsive disorders are infrequently reported in community studies. It is possible that cultural acceptance of internalising symptoms, particularly in girls, may be related to lower reporting. In addition, the dependence on parent or teacher reports in many studies means that the child's report of inner emotional states is missing. The existing community based studies also offer little conclusive information about psychiatric disturbances during adolescence.

The methodologically sophisticated ICMR study (ICMR, 2001) is a promising development. The forthcoming results will include information about developmental patterns of psychiatric morbidity, associated specific learning disabilities, intellectual impairment, abnormal psychosocial stressors, current level of functioning and felt need for treatment.

SCHOOL BASED STUDIES

Schools are important catchment areas for children, although the low literacy rates in India limit the generalisability of this data. Twenty three school-based, studies conducted over a period from 1978 to 2002, were identified (Table II). The total prevalence rates ranged from 3.23% to 36.50%.

The most prevalent disorders include enuresis, mental retardation and externalizing disorders such as conduct disorder and attention deficit hyperactivity disorder. School-based studies need to focus on other disorders of concern, like specific learning disabilities. Prevalence rates of specific disorders at the pre-school, middle and high school levels need to be reported separately. This information can provide guidelines for planning school-based services.

TABLE I : Prevalance Rates in Community Based Studies

Authors	Setting	Age range	N	Tool	Prevalance rate (%)
Surya et al (1996)	urban	0-15	2731	Screening Schedule	0.70 (MR)
Sethi et al (1967)	urban	0-10	540	Interview schedule	9.44 (Total) 5.74 (MR) 2.55 (enuresis)
Dube (1971)	mixed	5-12	8035	Interview schedule Clinical interview	11.69 (Total) 7.70 (MR) 0.62 (neurosis) 0.12 (Psychosis) 1.30
Elnager et al (1971)	rural	0-14	635	Interview schedule Clinical interview	1.30
Sethi et al (1972)	rural	0-10	877	Clinical interview	8.09 (Total) 6.84 (MR) 0.55 (epilepsy) 0.22 (neurosis)
Verghese & Beig (1974)	urban	4-12	747	Mental health item sheet, Clinical interview ICD-7	8.17 (Total) 8.70 (b); 7.60 (g) 5.22 (enuresis) 2.01 (MR) 0.81 (behavior disorder) 0.13 (sleepwalking)
Nandi et al (1975)	rural	0-11	462	Case detection schedule (p), Clinical interview	2.60 (Total) 2.24 (b); 2.93 (g) 1.29 (epilepsy) 0.87 (neurosis) 0.22 (MR; enuresis)
Thacore et al (1975)	urban	0-15	1191	Interview schedule (p) Clinical interview	6.90
Lal & Sethi (1977)	urban	0-12	272	Clinical interview DSM - II	17.27 (Total) 2.94 (MR) 2.57 (behaviour disorder, enuresis)
Shah et al (1980)	urban	<14	1089	Interview schedule & checklist (p), Clinical Interview	0.83
Kurup (1980)	rural	5-12	451	RQC	16.40
Singh et al (1983)	urban	1-14	279	Clinical interview ICD-9	29.40 (Total) 25.10 (special symptoms) 8.60 (CD) 4.70 (MR) 1.10 (development delays) 0.40 (hyperkinesis; conversion)

Sen et al (1984)	urban	0-14	NR	Case detection schedule (p), Clinical interview	0.56 (0-4 yrs.) 3.12 (5-14 yrs.)
Mehra et al (1985)	rural	<14	2012	IPSS (P), Clinical	1.84 (Total)
Nandi et al (1986)	rural	0-11	551	Case detection schedule (p), Clinical interview	0.48
Sachdeva et al (1986)	rural	0-14	660	Case detection schedule	1.06
Banerjee et al (1986)	urban(tribal)	0-14	320	IPSS (p)	
Premarajan et. al (1993)	urban	0-12	273	Interview schedule (p), Clinical interview	0.00 (0-4 yrs.) 1.15 (5-14 yrs.)
Hackett et al (1999)	rural	8-12	1403	IPSS (p), Clinical interview, ICD-9	5.86 (Total) 6.87 (b); 4.93 (g)
Nandi et al (2000)	rural	0-11	1173	CBQ (p & t), IW interview, ICD-10	9.40
ICMR (2001)	mixed	0-16	4389	Case detection schedule (p), Clinical Interview	2.73
				Screen checklist (p) CBL (p); CBQ (t); DISC (c & p)	12.50 (Bangalore centre) 12.10 (Lucknow center)

Abbreviations: NR : not reported; b: boys; g: girls; p: parent; c: child; t: teacher; MR: mental retardation; CD: conduct disorder; CBQ: Children's Behaviour Questionnaire (Rutter, 1967); CBCL- Child Behaviour Checklist (Achenbach, 1983); DISC- Diagnostic Interview Schedule for Children (NIMH, 1992); IPSS: Indian Psychiatric Survey Schedule (Kapur et al, 1974), IW interview: Isle of Wight Interview (Rutter et al, 1981); RQC: Reporting Questionnaire for Children (Giel et al, 1981)

Table II : Prevalence Rates in School-based Studies

Authors range	Setting	Age	N	Tool	Prevalance rate (%)
Rao (1978)	urban	13-16	428	GHQ - 60, Clinical interview	19.62 (Total) 18.80 (b), 22.80 (g)
John (1980)	urban	9-12	98	CBQ (t), Clinical Interview, ICD-9	15.21 (t) 21.43 (p)
Jiloha & Murthy (1981)	rural	5-12	715 (b)	Questionnaire (t), RQC (p), Clinical Interview; ICD-9	20.70 (Total) 8.80 (enuresis) 5.87 (MR) 2.10 (stammering) 1.67 (emotional disturbance) 1.60 (epilepsy)
Parvathavar hini (1983)	rural	5-12	309	CBQ (t)	10.60 (Total)
Sekar et al (1983)	urban	9-14	90	CBQ (t)	35.55
Kapur (1985)	rural	10-16	353 (b)	CBQ (t)	25.00
Rozario et al (1990)	urban	12-16	1371	CBQ (t)	6.42 (Total)
Bhargava et al (1988)	urban	4-12	6199	11.27 (b); 1.47 (g) Questionnaire	32.60 (p)

Dalal et al (1990)	urban	12-16	665 (g)	(p,t); DMS-II GHQ-30 (c)	38.10 (t) 30.92
Sarkar et al (1995)	urban	8-11	408	CBQ (t)	10.54 (Total)
Deivasigmani (1990)	urban	8-12	755	CBCL (p) CBQ (t), Clinical Interview (p & c) ICD-9	8.96 (b) 12.3 (g) 16.16 (t); 33.70 (p & c) 43.44 (b) 35.29 (g) 14.30 (enuresis) 11.13 (CD) 2.91 (MR) 1.72 (hyperkinesia)
Uma & Kapur (1990)	mixed	2 y, 10m	155	PBCL (p)	3.23 (Total)
Mehra et al (1991)	rural	-3y, 8m 6-12	2055	CBQ (t)	3.70 (urban); 2.97 (rural) 13.28 (Total)
Ruckmini (1994)	rural	5-12	271	CBQ (t)	14.53 (b) 10.20 (g) 13.60 (Total)
Sarkar et al (1995)	urban	8-11	408	CBQ (t)	13.10 (b) 14.50 (g) 10.54 (total)
Shenoy et al (1996)	urban	5-8	1535	CBCL, (p) CBQ (t); CBCL (t) CBCL (p)	8.96 (b) 1243 (g) 19.80 (t) 22.47 (b) 16.83 (g) 27.17 (p) 21.98 (b) 31.97 (g)
Banjerjee (1997)	rural	8-10	460	CBQ (t), Clinical interview (p), ICD-9	33.30 (Total) 41.90 (b), 19.80 (g) 13.50 (CD) 5.40 (MR) 4.00 (enuresis) 3.10 (disturbance of activity) 2.70 (relationship problems)
Sidha & Nijhawan (1999)	urban	8-10	300	GHQ- 60 (c)	27.67 (Total) 26.00 (b); 29.33 (g)
Dash et al (2000)	urban	8-11	NR	CBQ (t), Interview (c,p), CBCL (p), DICA - R (c) DSM - IIR	20.54
Bhatia et al (2000)	urban	3-5	100	PBCL (t)	22.00 (Total) 23.30 (b) 20.00 (g)
Mishra & Sharma (2001)	urban	12-18	1097 (g)	YSR (c)	13.76
Gupta et al (2001)	urban	9-11	957	CBQ (t), Clinical interview, ICD-10	36.50 (Total)
Malhotra et al (2002)	urban	4-11	963	CBQ (t) CPMS (p) Clinical Interview ICD-10	10.97 (t) 7.48 (p) 6.33 9.23 (b); 4.43 (g)

Abbreviations : NR: not reported; b: boys; g: girls; p: parent; c: child; t: teacher; y: years; m: months; MR: mental retardation; CD: conduct disorder; CBQ: Children's Behaviour Questionnaire (Rutter, 1967); CBCL- Child Behaviour Checklist (Achenbach, 1983); DICA Diagnostic Interview for Children and Adolescents- revised version (Reich et al, 1991), GHQ —30: General Health Questionnaire (Goldberg, 1972); PBCL: Preschool Behaviour Checklist (McGrille & Riebman (1986); RQC: Reporting Questionnaire for Children (Giel et al, 1981); YSR: Youth Self Report (Achenbach, 1991)

TABLE III : Prevalance Rates in Studies of Specific Disorders

Authors range	Setting	Age	N	Tool	Prevalance rate (%)
Mohan et al (1978)	school	14-16	2256 (b)	Questionnaire (c)	Substance abuse 34.20
Gade (1987)	school	5-10	321	Checklist (t), Rating scale (p), Clinical interview, DSM-III	ADHD 8.10 (Total) 7.17 (b) 0.94 (g)
Singh & Kamal Preet (1981)	communty	12-20	444	Questionnaire (c)	Substance abuse 15.34 (tobacco) 13.96 (alcohol) 8.50
Venugopal & Raju (1988)	school	9-10	137	PRS (t)	Leaing disabilities 20.61
Chawla & Shashi (1989)	school	6-12	2160	Checklist (t)	CD4.67
King & Bhugra (1989)	school	14-23	580 (g)	EAT - 26(c)	Eating disorder 29.00
Kushwaha et al (1992)	community	10-18		Questionnaire abuse	Substance 25.00 (slum) 15.00 (college)
Serrvan Schreiber et at (1998)	community (refugee)	61 8-17	c)	Questionnaire (c), Clinical interview DSM-IV	PTSD 11.50 (Total) 16.60 Depression 11.50 (Total)
Kumar et al (1999)	(refugee)	1100	c), Clinical interview DMS - IV		3.30 (b) 19.40 (g) 16.60 (b) 6.70 (g) Depression 11.50 (Total) 3.30 (b)
Kumar et al (1999)	school	13-19	C-YBOCS (c) DICA (s)	OCD	19.40 (g) 1.45 (Total) 2.01 (b)
Sinha et al (1999)	school	685			1.00 (g)
Bhola & Kapur (2000)	school	14-15	(b) GHQ-30 (c)		ED 5.69
	school	446	YSR (c)		
	school	13-16	(g) GHQ-30 (c) YSR (c)		ED 1999

Abbreviations : NR: not reported; b: boys; g: girls; p: parent; c: child; t: teacher; ADHD : attention deficit hyperactivity disorder; CD : conduct disorder, ED : emotional disorder, OCD : obsessive compulsive disorder; PDD : pervasive developmental disorder; PTSD : post traumatic stress disorder; DICA : diagnostic Interview for Children and Adolescent (Herjanic & Reich 1982); EAT : Eating Attitudes Test (Garner et al, 1982); PRS : Pupil Rating Scale (Myklebust, 1981); C-YBOCS : Yale - Brown Obsessive Compulsive Scale - Children's Version (Goodman et al, 1986)

STUDIES OF SPECIFIC DISORDERS

There are only 11 studies focusing on rates of specific psychiatric disorders and this is clearly an agenda for future research. Three of the studies were on substance abuse. This problem is rarely identified in community and school studies and perhaps requires specific tools and methodology. It is important to target disorders that appear to be underreported, disorders that have significant personal and/or social consequences or those that are priorities for local communities.

METHODOLOGICAL ISSUES: A CRITICAL APPRAISAL

The review identified 55 descriptive cross-sectional Indian epidemiological studies with heterogeneous research methods. Key methodological issues are examined in terms of their implications for the newer generation of studies.

Sampling : Sample sizes ranged from 61 to 8035 in community studies (mean size 1235; SD 1327; median size = 444) and 90 to 6199 in school studies (mean size — 913; SD 1170; median size = 520). The relatively small samples and the use of purposive or convenience sampling in many studies resulted in decreased precision in prevalence estimates. From a developmental perspective, it is critical to report separate prevalence rates for pre-school, childhood and adolescence (Sitholey & Chakrabarti, 1992). Large samples, spanning all three groups, would provide an understanding of developmental thresholds and changes in the prevalence of disorders by age. Some recent Indian studies ICMR, 2000; Malhotra et al, 2002) reflect the growing consensus about the use of multi-stage designs to estimate more accurate prevalence rates.

Case definition: Two methods to define "caseness" are the categorical classification using diagnostic systems like the Diagnostic Statistical Manual (APA, 1968; APA, 1980; APA, 1987; APA, 1993) and the International Classification of Diseases (WHO, 1964; WHO, 1978; WHO, 1993) or empirically derived classifications using psychometric assessments. Most community stud-

ies have relied on the former method, while the school studies have largely used the latter.

The majority of the studies have reported total prevalence rates with no information about prevalence of specific disorders or comorbid disorders. Recently, additional criteria are used as part of the diagnostic algorithm. These include severity of symptoms, associated psychosocial stressors, functional impairment and perceived need for mental health services. Indian studies provide little information, with two exceptions (Hackett et al, 1999). For example, the addition of impairment ratings significantly reduced the prevalence rate from 9.4% to 5.2% (Hackett et al, 1999).

Tools/Diagnostic Systems: The issue of selection of culturally appropriate and age/ developmental stage specific tools is a potential minefield. Many Indian studies have used researcher-developed questionnaires with inadequately tested psychometric properties. More recent studies, particularly those in the school setting, have used widely recommended tools like the CBQ (Rutter, 1967), CBQ (Achenbach, 1983) and the YSR (Achenbach, 1991). In concordance with epidemiological studies in the West the CBQ (Rutter et al, 1967) was the most reliable questionnaire. Both the ICD and DSM systems were used almost equally. Unspecified clinical interviews are yielding way to structured interview schedules like the DICA (Herjanic & Reich, 1982), DICA-R (Reich et al, 1991) and the DISC (NIMH, 1992).

Research exploring the applicability of Western tools in India is an encouraging trend. Studies have reported poor sensitivity and specificity of the CBQ (Malhotra et al, 2000; Malhotra et al, 2002; Sekar et al, 1983), particularly for detecting internalising problems (Sarkat et al 1995). Tools like the CBQ have no prior identifying conversion symptoms, commonly prevalent in India (Kapur, 1985). More recently, the Strengths and Difficulties Questionnaire (Goodman, 1997) has been proposed as a screening instrument with high sensitivity but moderate specificity in the Indian setting (Malhotra et al, 1999). The cutoff points of the CBQ (Banerjee, 1997) and CBI. (Shenoy et al, 1996) have been modified to reduce misclassification rates. The Childhood

Psychopathology Measurement Schedule (Malhotra et al, 1988) and the Developmental Psychopathology Checklist (Kapur et al, 1995) represent efforts at developing indigenous screening tools.

Multi-Informant Data: A consistent finding in the literature is the low agreement among these different informants - child, parents, teachers, peers, and clinicians (Achenbach et al, 1987). Some studies reported informant-specific prevalence rates (Bhargava et al, 1988; Deivasigamani, 1990; John, 1980; Shenoy et al, 1996; Malhotra et al, 2002), though most collected information from a single informant. Prevalence rates may vary depending on who identifies the disorder. For instance, one study (Rozarmo et al, 1990) reported an unexpectedly low prevalence rate of 1.47% among adolescent girls, using teachers as informants. Concordant with earlier findings from Western literature (Achenbach et al, 1987), this suggests that self-report measures may provide more accurate estimates for adolescents, particularly for those with emotional or internalising disorders. Although teachers are good informants, they may be less sensitive to certain symptoms or unaware of those that occur mainly at home (e.g. nocturnal enuresis). It is important to be aware that the reliability of informants may vary depending both on the developmental stage and the type of disorder.

Data Analysis: Most studies do not mention whether prevalence rates are point or period prevalence rates. Only three studies (Hackett et al, 1999; Malhotra et al, 2002; Servan-Schreiber et al, 1998) calculated the confidence intervals of the prevalence estimates. Despite available data, the odds ratios or separate prevalence rates based on gender or developmental stage are often not reported. More complex statistical procedures need to be used as epidemiological studies continue to expand the scope of their questions.

CROSS-CULTURAL ISSUES

Cross-cultural differences in epidemiological research may reflect actual differences in prevalence rates, problems related to adequacy or applicability of tools, or differences in expressions and thresholds of

distress, recognition of disorders and help seeking behaviour (Kleinman, 1988). Rates of conversion disorder are reported to be much higher in India than those reported in the West (Sitholey & Chakrabarti, 1992). Speculation includes the possibilities that physical symptoms are viewed as a "medical problem" and brought to clinics more often or that there is a genuinely higher prevalence rate reflecting socio-cultural factors. In India, child rearing tends to be more authoritarian with less free verbal expression of emotions (Malhotra & Charurvedi, 1984). Higher rates of mild mental retardation have been documented when compared to Western figures (Srinath & Girimaji, 1999), suggesting lacunae in health care facilities, maternal and child nutrition and education (Srinath & Girimaji, 1999).

Epidemiological research should also be responsive to the diverse ethnocultural communities within India. There are no substantive conclusions about rural-urban differences due to the disparate research methods used across studies. Studies suggest some differences, for example, lower rates of enuresis in rural settings. This could be related to tolerance of symptoms, toilet training methods and other socio-economic and cultural variations across rural and urban setting. The emerging results of the ICMR study should throw further light on this area. Sociocultural changes can also influence prevalence rates of psychiatric disorders. Traditionally in India, thinness has been associated with lower attractiveness, power and social status, perhaps partly due to the high rates of poverty and other distinct cultural ideologies (Varma & Chakrabarti, 1995). With rapid social changes, one can speculate that the rates of eating disorders among Indian children and adolescents may increase over time.

Distress is expressed differently across cultures and studies must use tools and methods that are cross-culturally valid or tailored for use in the Indian setting. For example, the instrument EAT-26 (Garner et al, 1982) used to identify eating disorders, has some questions reflecting culturally desirable behaviour, leading to inflated prevalence rates in an Indian sample. Culturally adapted tools need to reflect the vocabulary people use to think about and discuss illness, in keeping with this, Hackett

et al (1999) used broad divisions of internalising and externalising disorders instead of ICD-10 categories, based on the likelihood of recognition by rural South Indian parents. Translation of tools is a unique challenge in a country with 18 official languages, and many more in use. This perspective needs to be integrated into future epidemiological studies.

CONCLUSIONS AND FUTURE DIRECTIONS

Child psychiatric epidemiology has made many important methodological and conceptual advances and is moving towards firmer ground. Future studies must expand the lens to include the psychosocial correlates of psychiatric morbidity. One of the few substantive conclusions from Indian work is the higher prevalence of externalising disorders in boys and internalising disorders in girls. Recently; Hackett et al (1999; 2000) identified multiple correlates of psychiatric disturbance, including male gender, Muslim religion, lower socio-economic strains, less parental education, school failure, impaired reading and vocabulary and life events. Certain important questions can only be answered by longitudinal studies, which are completely absent in India. Large-scale methodologically sound multicentre studies with interdisciplinary collaboration are urgently needed. A database of patterns of service utilisation, felt need and barriers to recognition and helpseeking would be critical for a developing country. A response to these challenges and opportunities will increase the value of epidemiological data for both clinicians and policy makers in India.

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