

# Review Articles

## Epidemiology of Childhood Psychiatric Disorders

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### Introduction :

Epidemiological studies are important as they can give insight into the magnitude, distribution and aetiological factors of health problems, Child psychiatric epidemiology is principally aimed to determine the rates and distribution of child psychiatric disorder. The data obtained is useful for descriptive, administrative and analytic purpose<sup>1</sup>.

A sizeable number of epidemiological studies have been carried out in different parts of the world during the past 17 years. The studies have used either empirically-based quantitative taxonomy that aims to detect patterns of co-occurring problems or diagnostically-based classification systems and the assessment procedure was either two-stage approach or assessment in a single stage.

This review summarizes the representative epidemiological surveys on childhood psychopathology that have been carried out in particular geographic community, primary care and school settings in different parts of the world in terms of prevalence estimates and correlates. In addition, reports of hospital surveys in Bangladesh are described to give an idea about childhood psychiatric disorder in Bangladesh. Finally, some of the methodological aspects that includes cross-cultural issues for epidemiological research are also discussed.

### Prevalence of Psychiatric Disorders in Children: Developed Regions :

Several studies have been carried out in Western countries regarding prevalence of psychiatric disorders among children and adolescents. Table-I summarizes some of these studies. The Isle of Wight study<sup>2</sup> is the most prominent and frequently referred to when epidemiology issues are in question. In this study, a prevalence rate for psychiatric disorders of 6.8% was found within the total population for<sup>10-11</sup> year olds by using a two-stage screening procedure - Rutter parent scale and Rutter teacher scale in stage one and standardised clinical process of Rutter parent interview in stage two. Of these, conduct and mixed disorders were found in 4% and emotional disorder in 2.5%. Later, Rutter et al<sup>3</sup> compared the results of another sample of the Isle of Wight survey with those of inner London borough study. The prevalence figures were 12% and 25.4% respectively.

Thompson et al<sup>4</sup> found a 13.2% prevalence rate of psychiatric disorders in Southampton among 3 year old children. Similarly, Garralda and Baily<sup>5</sup> reported that 23% of children attending general practice in Manchester, as having psychiatric disorders. A prevalence of 16% was reported by Esser et al<sup>6</sup> in German school children. In France, Fombonne<sup>7</sup> had reported 12.4% of school children to be psychologically disordered. In North America, Kashani et al<sup>8</sup> identified 18.7% as having a psychiatric disorder in an adolescent population of 14-16 year olds of age in Columbia. In the Ontario Child Health Study, Offord et al<sup>9</sup> examined a large sample of children of 4-16 years old in the Canadian province of Ontario. A prevalence rate of 18.1% was found for one or more psychiatric disorders. Cohen et al<sup>10</sup> found approximately 12% of New York children and adolescents to be suffering from some form of psychiatric problems.

Prevalence of childhood and adolescence disorders in developed countries has been reflected in several reviews. Links<sup>11</sup> in a review of community surveys on prevalence of child psychiatric problems examined 16 studies. The vast majority of these are in the developed world, mainly Britain, USA, Denmark and Australia. The prevalence rate in these studies ranged from 3.7% to approximately 50%. In a similar review<sup>12</sup> of 5 community samples the prevalence rate varied between 17.6% and 22%, where DSM III criteria were employed. In another review of 8 epidemiological surveys done in the Netherlands, Norway, New Zealand, Canada and other countries, the prevalence rates ranged between 5.0% and 26%<sup>13</sup>. Recently, Bird<sup>14</sup> listed the important epidemiological studies done on childhood psychiatric disorders in different cultural settings within the developed countries over the past fifteen years. He stated 12-15% prevalence rates of child psychiatric disorders. The psychiatric diagnoses of these studies were based on either ICD-9 or DSM-III/DSM III-R criteria.

### Prevalence of Psychiatric Disorders in Children : Developing Countries :

Epidemiological studies in developing countries also demonstrate significant morbidity of child psychiatric disorders. The summary of some of these studies is given in Table-II. In his pioneering study, Cederblad<sup>15</sup>



**Table-I**  
*Summary of Child Psychiatric Epidemiological Studies in Western Countries*

| Study                 | Location                                    | Sample Size | Age (years) | Sampling frame                            | Method   | Assessment procedure  |  | Case Definition               | Findings               |   |
|-----------------------|---|-------------|-------------|---|----------|---|--|-------------------------------|------------------------|---|
|                       |   |             |             |   |          | Stage 1   | Stage 2  |                               | Prevalence             | Associated factors  |
| Rutter et al 1970     | Isle of Wight UK                            | 3316        | 10-11       | Attending schools                         | 2-stage  | Rutter Scale A-P<br>Rutter Scale B-T  | Rutter Parent I  | Clinical                      | 6.8%                   | Low IQ<br>Chronic Physical Illness  |
| Rutter et al 1975     | Isle of Wight<br>Inner London Borough<br>UK | 1689        | 10-11       | Attending Schools                         | 2-stage  | Rutter Scale B2 T   | Rutter Parent interview  | As above                      | ILB - 2.5%<br>10 W-12% | Family discord<br>Parental deviance<br>Social disadvantages<br>School characteristics |
| Garralda & Baily 1986 | Manchester UK                               | 276         | 7-12        | Attending 7 GP Practices (Primary care)   | 2-stage  | Rutter Scale A-P<br>DS Questionnaire  | Rutter Parent I<br>Gen health quest<br>Social Stress & Support Interview | As above                      | 23%                    | Excess of girls<br>family disruption<br>family history of disorder                    |
| Thomson et al 1996    | Southampton UK                              | 1618        | 3           | Children registered with GP               | 1-stage  | Behavioural checklist (BCL)<br>EAS Temperament Questionnaire<br>WWP Activity scale<br>Gen health Quest. | -  | Score > 10 in BCL             | 13.2%                  | Overcrowding  |
| Esser et al 1990      | Maneheim Germany                            | 1444        | 8           | School children                           | 2-stage  | Rutter Scale A-P<br>Rutter Scale B2 - T   | Rutter Parent I<br>ICD - 9   | Clinical<br>Rutter definition | 16.2%                  | Stressful life events<br>Learning disabilities<br>Family adversity                    |
| Forbonne 1994         | Charatres France                            | 2441        | 6-11        | School children                           | 2- Stage | Child behaviour checklist (Mother)<br>Rutter Scale B2 (Teacher)   | Rutter Parent I<br>ICD -9  | As above                      | 5.9%                   | Excess of boys<br>Children with special educational needs                             |
| Offord et al 1987     | Ontario Canada                              | 2679        | 4-16        | Attending school                          | 1-stage  | Interview with modified CBCL scales   | -  | DSM-III                       | 18.1%                  | Age & Sex difference<br>Family dysfunction<br>Academic failure<br>Sexual relations    |
| Kashani et al 1987    | Columbia Ml. USA                            | 150         | 14-16       | attending school                          | 1-stage  | Interview with DICA (Child)<br>DICA -P (parents)  | -  | DSM III                       | 18.7%                  | Physical abuse<br>Low self concept<br>sexual relations                                |
| Cohen et al 1993      | Upstate New York, USA                       | 975         | 9-18        | Children of family with multiple children | 1-stage  | Interview with DISC -C (Child)<br>DIS-P (parents)   | -  | DSM III                       | 12.0%                  | Low SES<br>Low maternal education<br>Family structure<br>pregnancy problems           |

**Table-II**  
*Summary of Child Psychiatric Epidemiological Studies in Non-Western Countries.*

| Study              | Location                                  | Sample Size | Age (years) | Sampling frame                          | Method                            | Assessment procedure   |   | Case Definition               | Findings            |  |
|--------------------|---|-------------|-------------|---|-----------------------------------|--|---|-------------------------------|---------------------|--|
|                    |   |             |             |   |                                   | Stage 1  | Stage 2   |                               | Prevalence          | Associated factors   |
| Cederblad 1968     | Khartoum<br>Sudan                         | 1700        | 3-15        | Suburb household sample                 | 2-stage                           | Structural questionnaire (parents)                                   | Clinical parent I<br>Clinical child interview<br>Good enough Human figure Drawing | Clinical                      | 8.0%                | Poor physical health<br>Extended family  |
| Minde 1975         | Buganda<br>Uganda                         | 577         | 7-15        | Children of 3 schools                   | 2 - stage (only 1 stage Reported) | Rutter Scale B-T   | -   | Cut off on questionnaire      | 19%<br>10.5%<br>24% | Household with >2 adults<br>Poor academic record<br>broken home<br>Poor nourishment  |
| Giel et al 1981    | Colombia<br>India<br>Sudan<br>Philippines | 925         | 5-15        | Children Attending primary care setting | 2-stage                           | Reporting Questionnaire for children<br>Health staff Rating (author) | Clinical interview & follow up interview for school children                      | Clinical                      | 12-29%              | -  |
| Bird et al 1988    | Puerto Rico                               | 843         | 4-16        | Probability sampling of households      | 2-stage                           | Child Behaviour checklist (Parent and child versions)                | DISC-C, DISC-P<br>Children Global Assessment scale                                | Clinical<br>Rutter definition | 15-18%              | -  |
| Yu-Feng et al 1989 | Beijing<br>China                          | 2432        | 7-14        | School children                         | 1-stage                           | Rutter scale B (teacher)   | -   | Cut off 9 on questionnaire    | 8.3%                | Quarrelling family<br>Parental divorce<br>Broken family<br>Less parental involvement |
| Weisz et al 1993   | Embu<br>Kenya                             | 90          | 11-15       | household sample                        | 1-stage                           | Child behaviour checklist (Parent version)                           | -   | Clinical                      | 19.7%               | Somatic problem of child   |
| Mulatu 1995        | Jimma<br>Ethiopia                         | 611         | 6-11        | household sample                        | 2-stage                           | Reporting questionnaire for children                                 | Child Behaviour problem questionnaire   | Cut off of $\geq 1$           | 23.2%               | Maternal psychopathology<br>family stresses<br>child disability                      |



surveyed three complete Sudanese village near Khartoum and found an average psychiatric morbidity of 8% among children aged 3-15 years. A further 20% of all children presented with 'moderate symptoms'. Minde<sup>16</sup> investigated Ugandan School children aged 7-15 years in different setting and found that 10.5% of youngsters in a rural sample and 24% of those in urban settings, scored within the clinical range on a valid symptom checklist. A four-country study done in primary health care settings in Sudan, Colombia, India and the Philippines gave a prevalence rate which varied from 12 to 29% for child psychiatric disorders<sup>17</sup>. Bird and colleagues<sup>18</sup> in a community survey in Puerto Rico, revealed 15-18% of children suffering from moderate to severe psychopathology. In China, a controlled study of school children in urban areas of Beijing reported that the rate of behaviour problems in primary school was 8.3%<sup>19</sup>. In Kenya, an epidemiological survey revealed 19.7% of children suffering from behavioural and emotional problems<sup>20</sup>. Research findings in South Africa reported a very wide range of prevalence of child psychiatric disorders which were reviewed by Parry<sup>21</sup>. He concluded that the range of child psychiatric morbidity was between 17 and 40%. In Ethiopia, Mulatu<sup>22</sup> reported 23.2% prevalence rate of psychopathology among children of 6-11 years. All of these studies show that the rate of psychiatric morbidity among children and adolescents in developing countries is very close to the rates of disturbances reported from studies in developed countries.

It can be observed from the studies reviewed above that the prevalence, though similar in many parts of the world, still shows considerable variation ranging from as low as 3.7% to over 51%. This emphasizes the importance of assessing the exact rates in individual areas. The differences in prevalence rates in all these surveys are not unexpected. The sources of variability include the characteristics of target samples, the sampling methods, case definition, types of informants, assessment procedure and sociocultural context. Despite variations in the prevalence rates, it has been estimated that at the very least, 12% of children and adolescents have clinically important mental disorders, and at least half of them are deemed severely disordered or handicapped by their mental illness<sup>23</sup>.

### ***Psychiatric Disorders in Children – Bangladesh Perspective :***

Psychiatric disorder among children of Bangladesh has not yet been studied. According to the analytical predictions, prevalence would be roughly 10-20% among children and adolescents as reported from other developing countries. A considerable number of children suffering from psychiatric problems attend psychiatric units of different hospitals in Bangladesh. A study of psychiatric outpatient attendance at the Institute of Mental health and Research in Dhaka revealed that 8.6% of cases were children or adolescents<sup>24</sup>. In a different analysis of psychiatric morbidity among the Institute outpatients, emotional disorder was found to be the largest group with 32.5%, followed by conduct disorder 18.8%; mental retardation comprised 16.2%, psychoses and allied conditions 11.2%, epilepsy with behavioural problems 12.5% and the rest 8.5% comprised of other groups of disorders, according to ICD -9 criteria<sup>25</sup>. In a survey among the children in a child guidance clinic at the Bangladesh Institute of Child Health and Dhaka Children's Hospital, Rabbani and Quamaruzzaman<sup>26</sup> assessed psychiatric morbidity by using the Rutter Multiaxial diagnostic system. Their findings revealed that conduct disorder was 8.9%, somatoform disorders 7.1%, attention deficit hyperactivity disorder 6.8%, and autism 6% of the cases. Specific delays in development was found to be 10% and mental retardation was 17.8% of the cases. These studies indicate that psychiatric morbidity among children in Bangladesh is likely to be comparable with other countries.

### ***Risk Factors for Development of Childhood Psychiatric Disorders :***

Various child psychiatric epidemiological research studies have reported many variables that can be said to be aetiologically linked to the child psychiatric disorders either in a favourable or unfavourable direction. Here, some specific correlates have been evaluated along with its proposed possible mediating mechanism on the basis of empirical findings.

#### ***Age and Sex***

In community surveys, the prevalence of one or more disorders tends to be less in the younger age group than in the older age group, and overall to be more common in boys than girls. In the Isle of Wight survey, psychiatric disorder was, in general, twice as



prevalent in boys, although within the category of emotional disorder there was a slight excess of girls<sup>2</sup>. In the Ontario Child Health Study<sup>9</sup> for children 4 to 11 years old, prevalence was higher among boys (19.5%) than girls (13.5%), while the reverse was true among children 12 to 16 years (18.8% for boys versus 21.8% for girls).

### **Racial and Ethnic Minorities**

There is evidence from several community studies that the rate of emotional and behavioural problems varies in race and ethnic minority. For instance, in a total population survey of 10-year old children in an inner London borough, more behavioural problems were reported among children from West Indian immigrant families compared with children from non-immigrant families<sup>3</sup>. Conversely, children of Asian origin in Britain appear to have comparable rates or slightly reduced frequencies of psychiatric disorders compared to white children<sup>27</sup>. Difficulty in performing satisfactorily in school and growing up in adverse family conditions appear to be two major factors that place children in certain racial and ethnic groups at increased risk for emotional and behavioural problems<sup>28</sup>.

### **Chronic Health Problems**

A consistent finding in general population surveys of children is the increased rate of psychiatric problems with chronic health problems, as compared to healthy children<sup>2,29</sup>. Possible aetiological variables include low self-esteem, poor peer relationships and poor school performance<sup>30</sup>.

### **Brain damage**

Children with brain damage are at increased risk for psychiatric disorder. In the Isle of Wight study, the rate of psychiatric disorder was increased five times in youngsters with cerebral palsy, epilepsy or some other disorders above the brain stem<sup>2</sup>. Several studies indicate that brain damage puts children at risk for psychiatric disorder in general rather than a specific type of disturbance<sup>31-33</sup>. Possible mediating variables include psychosocial disadvantages<sup>31,32</sup>, intellectual and cognitive disability leading to poor school performance<sup>2,31</sup> and abnormal temperament<sup>31</sup>.

### **Temperament**

Individual children differ from one another in certain behavioural patterns such as activity level,

behavioural inhibition and sociability<sup>34</sup>. It has been found that among a general population sample of children at age 7, those who were judged to be temperamentally difficult, compared to those with an easy temperament, had more psychiatric disorders at age 12<sup>35</sup>.

### **IQ, Learning Disorders**

Children who do poorly in school, whether because of low IQ or a specific learning disorder are at increased risk for psychiatric disorders<sup>2,36</sup>. This is particularly true for conduct disorder<sup>2</sup> and hyperactivity<sup>37</sup>.

### **Psychosocial Factors**

#### **Parental Psychopathology**

Parental psychiatric disorder is associated with increased rates of emotional or behavioural problems in offspring<sup>2,38</sup>. Weisman and colleagues<sup>39</sup> found that offspring, aged 6 to 23, of depressed parents had significantly higher rates of major depression, substance abuse, mean number of psychiatric diagnoses, psychiatric treatment, poor social functioning and school problems, compared to the offspring of normal parents.

#### **Family Factors**

Poor parenting, marital discord and family dysfunction have all been associated with an increased rate of psychiatric disorder. For example, prevalence of discordant family relationships<sup>2</sup>, lack of emotional warmth displayed towards the child and marital discord<sup>40</sup> are all associated with antisocial behaviours in children. Child-identified but not parent-identified anxiety disorders have been reported to be significantly associated with family difficulties<sup>12</sup>. Large family size (usually four or more children) has been associated with increased rates of conduct disorder and delinquency in boys<sup>2</sup>.

#### **Social Class**

Rutter et al<sup>2</sup> found no significant relationship between social class and psychiatric disorder as determined by parental occupation based on occupational prestige. In contrast, when social class is measured in terms of economic disadvantage, there is a strong and consistent relationship with child psychiatric disorders<sup>28</sup>.

#### **Urban-Rural Dwelling**

A number of studies have reported increased rates of child psychiatric disorder in urban as compared to



rural settings<sup>3,9</sup>. These elevated rates are especially marked in pre-adolescents rather than adolescents and are related particularly to chronic disorder of early onset<sup>34</sup>. In a comparison of the rate of child psychiatric disorder in the Isle of Wight (a predominantly rural setting) and inner London borough (an inner city area), it was found that a two-fold increase in the prevalence of psychiatric disorder in the urban setting was accounted for entirely by the increased rates of psycho social adversity and disadvantaged schools in the inner city area<sup>38</sup>. Other characteristics of the urban environment, such as the physical design and layout of large housing complexes, which make it difficult to supervise children adequately, and the lack of social support for parents in this setting, may also contribute to the elevated rates of child disturbance<sup>41</sup>.

#### **Protective Factors in Prevention of Childhood Psychiatric Disorders :**

Within the child, several types of protective factors have been identified<sup>2,34,42</sup>. These are female sex, above average IQ, easy temperament and considerable self-understanding. Family protective factors include a high degree of cohesiveness within the family and a good relationship with one parent. The reported protective factors in the wider community include excellent schools and social development and recreational programmes. Mediating mechanisms for protective factors include reducing the impact of risk factors on the individual, lessening a chain of negative events and increasing the self-esteem and self-efficacy of the individual<sup>34</sup>.

#### **Correlates of disorders in Bangladesh**

Similar to other less developed countries, Bangladeshi children are subject to a large diversity of conditions, which may affect negatively their physical and psychological well-being. These conditions include malnutrition and illiteracy. Conversely, Bangladesh has strong family support and a high degree of cohesiveness within the family inherent in the culture. These factors can be considered as major protective factors.

In Bangladesh, analysis of hospital surveys among children with psychiatric disorders revealed some correlates of psychiatric morbidity. For instance, poor socio-economic condition, physical illness, malnutrition and inadequate social amenities were identified as suspected aetiological factors for the development of psychiatric disorders among children<sup>25</sup>. Association of conduct disorder with

marital discord in parents, parental mental and physical illness were reported<sup>26</sup>. Family discord was identified as the most frequent stress, significantly related with deliberate self-harm among teenagers<sup>43</sup>. As the samples of these studies are biased, conclusion based on these must be viewed with caution. The epidemiological research will more reliably identify the factors influencing the development of child psychopathology in a favourable or unfavourable direction in Bangladesh.

#### **Discussion on Issues :**

The selected issues in the child psychiatric epidemiology field are briefly disclosed in this section.

##### *Measurement of disorders*

It is expected that an epidemiological study of child psychiatric disorders will yield important results, which can be used in different ways and aspects. There are two major types of instruments used to measure child psychiatric disorder in epidemiological surveys : structured interviews and problem checklists. These instruments have informant-rated (parents, teachers etc.) and self-rated versions, offer many advantages. By using reliable and valid instruments in a two-stage procedure and by minimizing all possible biases, it would be possible to obtain a valid and reliable picture of child psychiatric pathology.

##### *Disagreement among Informants*

A uniform finding in the literature is the low agreement among informants about children's behaviours. Case ascertainment depends heavily on who provides information for assessment. Prevalence rates of disorders and the patterns of associated features can vary depending on who identified the child as having disorder. Therefore, the identification of childhood disorders is much influenced by the perception of informants and the contexts in which assessments are done. Traditionally, psychiatric assessment of children has considered data from multiple information, each may provide information about different aspects of the child's functioning<sup>14</sup>.

Many experienced clinicians and researchers in child psychiatry believe that information from multiple informants facilitates the best estimate of diagnosis in the individual case<sup>44</sup>. This strategy should be adapted in the screening procedure of an epidemiological survey to obtain a comprehensive picture of the children's behaviour.



### *Measurement of other variables.*

Reliable and valid measures of correlates and associated features are just as important as psychometrically sound measures of disorder if the aim is to describe accurately the strength of the relationship between disorder and correlates. Though there is a good number of reliable and valid measures in this aspect, unresolved issues remain. What is needed are reliable and useful measures of impairment that are independent of the usual informants.

### *Cross Cultural Issues*

Cultural factors are very important to consider in designing epidemiological studies, particularly in the field of child psychiatry, where there are wide variations of measures, cultural differences in judgments of behaviour and unresolved issues on cross-cultural application of standardized assessment procedures (especially validity). There is evidence of trans-cultural variation in the pattern of child psychiatric disorders and their prevalences, the risk and protective factors and the degree of vulnerabilities<sup>14,19,46</sup>. Research can be made culturally sensitive through a continuing repeated and open-ended series of questions and insertion of adaptations designed to match the process of enquiry with the cultural characteristic of the group being studied. Examples include pre-testing and planning of research, collection of data and translation instruments, instrumentations of measures and analysis and interpretation of data<sup>45</sup>. Moreover, cross-cultural epidemiological studies are essential for establishing a common methodology that is needed to test the generalibility of findings<sup>1</sup>.

### **Conclusion :**

Epidemiological surveys in the field of child psychiatry have made important contributions to our understanding of childhood psychiatric disorders. They have advanced our knowledge by their prevalence findings, their correlate data, and in terms of instruments and methodology, generating and testing hypothesis. Information based on epidemiological research is lacking in Bangladesh. Culturally sensitive and comparable, carefully designed community studies can lead to a scientifically based information and greater understanding of the nature and extent of psychiatric disorder among the children in Bangladesh.

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