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Screening for emotional and behavioural problems amongst 5–11-year-old school children in Karachi, Pakistan

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Abstract *Background* While a number of studies in the western countries have provided estimates of prevalence for child psychiatric morbidity and associated risk factors, relatively little is known about child psychiatric problems and risk factors in developing countries like Pakistan. *Method* A cross sectional survey of 5–11-year-old children attending main stream private and community schools in Karachi was conducted. Seven private and eight community schools agreed to participate. About 1488 consent forms were sent to 700 parents of private school and 788 parents of community school children. A total of 675 parents agreed to participate in the study. The response rate was 45.4%. Assessment of children's mental health was conducted using Strength and difficulties questionnaire (SDQ) by parents based on cut-off provided by Goodman. *Results* About 47% children were rated as normal, 19% as borderline and 34% as abnormal by the parents. Ordinal regression was used to identify factors associated with parent's rating. The odds of female children of being normal was 1.5 times relative to male children, adjusting for school type and mother's education (ORadj = 1.5, 95% CI: 1.1–2.0). Children attending private schools were more likely to be normal as compared to community school children, adjusting for child's gender and mother's education (ORadj = 2.3, 95% CI: 1.3–4.0). *Conclusion* In the present study, prevalence of child mental health

problems was higher than reported in studies from other countries. Prevalence was higher amongst children attending community schools. Consistent with most studies, male children were at a higher risk than females. There is a need for developing programs to train, sensitise and mobilize teachers and parents regarding child's psychological, emotional and behavioural problems with special attention to community schools. Since the male child is at a greater risk we should be cognizant of this while evaluating children for psychopathology.

Key words Pakistan – child mental health – prevalence – risk factors

Introduction

In reviewing 52 epidemiological studies of child and adolescent disorders mental health Roberts et al. [22] found tremendous variations in prevalence rates ranging from 1% to 50% with a mean prevalence rate of 15.8%. These authors also observed that the rates varied, depending on age, gender and other factors, with approximate rates of 8% for preschoolers and 12% in studies including wider age ranges.

The high prevalence of psychiatric disorders in children and adolescence is not exclusive to Western societies. The range of disorders seen in children in developing countries is not too different from that in the West, and includes emotional disorders (anxiety, depression, and phobias), behavioural disorders (conduct), Neuropsychiatric disorders (Hyperkinetic disorders), learning disabilities and pervasive developmental disorders (autism, Asperger's Syndrome). Also neurological disorders such as epilepsy are very prominent.

The importance of early detection of emotional and behavioural problems is being recognized worldwide. However, up until now there has been

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little systematic research into childhood psychiatric disorders in the developing countries [20]. In the past year, two more studies have been carried out in developing countries exploring the prevalence of child psychiatric disorders. A study carried out in Bangladesh on a sample of 922, 5–10-years-old children [18], found an estimated prevalence for any ICD-10 diagnosis around 15%. Another study carried out in India [26] indicated a prevalence rate of 12.5% among children aged 0–16 years.

The presenting features of mental disorder in children can be associated with one or more risk factors. These add to the complexity of the condition, influence severity and so may determine the nature of the service required. There is a wide range of predisposing and precipitating factors which can result in an equally wide range of difficulties. A review of English-language journals published since 1990 and three global mental health reports identified 11 community studies among adult population from six countries in Africa (Lesotho and Zimbabwe), Asia (Indonesia and Pakistan) and Latin America (Brazil and Chile). The findings of these studies suggested an association between poverty and common mental disorders in six low- and middle-income countries. Most studies showed an association between indicators of poverty and the risk of mental disorders, the most consistent association being with low levels of education [21].

Social factors are clearly implicated in the genesis and maintenance of these and in their extension into adulthood [24]. Such factors include the quality of the parents' relationship; family structure and aspects of family function; parental mental health, parent's education and occupation, total family income, the socioeconomic status of the family, child's school experiences and broader environmental circumstances such as adequacy of housing [6, 11, 13, 17]. There is also good evidence that childhood difficulties can be the precursors of adult criminality and mental disorder [4, 14] Child and adolescent mental health is directly and indirectly influenced by genetic factors, physical health, developmental status and educational ability.

There is increasing evidence of interaction between all of these and other psychosocial factors in the genesis of mental health difficulties [2, 23].

While a number of risk factors associated with childhood psychopathology have been identified in the western culture, it cannot be assumed that the same factors will operate universally. Most of the world's youth live in developing countries like Pakistan in a setting that carry a wide range of risk factors including poverty, malnutrition, infectious diseases, inadequate schooling, child labor etc.

Available evidence suggests that specific cultural and socio demographic variables are important in determining the risk in any given community [3, 7, 12].

Population-based epidemiological studies among adults show the prevalence of common mental disorders in Pakistan to be one of the highest in the developing world—higher even than developing countries with similar socio-economic indicators [19]. These figures range from a low of 25% (urban areas) to a high of 72% (rural areas) for women and between 10% (urban) and 44% (rural) for men [19]. In Pakistan, the current scarcity of child mental health services mirrors the scarcity of epidemiological studies. There is a lack of mental health services for children, partly reflecting a lack of adequate information about the magnitude of the needs that should be met, or even the most basic information about what are the main behavioural and emotional problems. There has been only one study carried out in Lahore, capital city of the province of Punjab which aimed to establish the prevalence of emotional and behavioural problems in school children using the Rutter rating scales. The study found a prevalence of 9.3%, with antisocial problems being the commonest [15]. The Lahore study used a questionnaire as the only measure for emotional and behavioural problems and indicated a wide range of mental health problems among this age group. No such study has been carried out since then. The timing is therefore right for a larger-scale and better designed epidemiological study on the mental health needs of Pakistani school children. This should address the important issues, including questions like; what is the prevalence of behavioural and emotional disorders amongst Pakistani school children? And how do they correlate with specific cultural and socio-economic factors?

The objective of the present study is to estimate the prevalence of emotional and behavioural problems among 5–11-year-old school children. Moreover, we also aimed to identify socio demographic characteristics of children associated with their mental health status. The factors that were examined included those suggested by previous studies [1, 3, 7, 12] as well as other factors based on the peculiarities of the cultural setting in the area.

Method

■ Setting

The study was conducted in Karachi, which is located in south-east of Pakistan, its population at the time of the survey was estimated as 15 million. Karachi is divided into 18 towns each having its own union council and district "Nazim" (mayor). Karachi is the largest city of Pakistan and is the main industrial and business hub.

■ Sampling strategy

The educational setup in Pakistan comprises of public or government run schools, community schools and private schools, with the latter offering much better quality of education and facilities. In order to give equal representation we aimed to collect data from all

school types. However, despite our efforts we were unable to obtain permission from government school authorities for participation in our research study. Therefore data was collected from community and private schools. Community schools are run by non-governmental organizations (NGOs) and mostly have a low fee structure and cater for lower socio economic class. Sindh Education Foundation (SEF) was established in 1992 as a semi-autonomous organization with the main aim to provide education to disadvantaged communities. A town-wise list of all the community schools in Karachi was obtained from SEF. They advised us to select nine towns assuring that school authorities in these towns were most likely to cooperate with us. From each of these nine towns one community school was selected. In seven of these towns we were also able to identify a private school. Two of the private and three community schools selected declined to take part in the study, asserting that the topic might upset parents or was irrelevant to their pupils. We contacted three other community schools in the same towns of which two agreed to participate, of the two other private schools contacted in the same towns both agreed to participate. Hence a total of seven private and eight community schools agreed to participate. From each school 100 children were selected, 20 from each class (grades 1–5). If there were less than 20 children in a class all were selected and if there were more than 20 then 20 were selected from the class attendance register using alternate odd–even serial number to select children from each class (grades 1–5). A total 1488 children were selected and consent forms and information sheets were sent to their parents. The consent forms were collected by the teachers. About 675 parents gave consent to participate in the study. The response rate was 45.4%. Those who agreed to participate in the study were called on a later date to the school for data collection. Active parental consent was required before a child could be considered for inclusion in the study. Consequently, children of those parents who did not give consent were excluded. Information on non respondents was not collected and therefore not part of the analysis. Children were eligible for the study if they were over 5 year of age and had not yet reached their 12 birthday. This age range was chosen mainly because this is the age for compulsory schooling in Pakistan according to “Compulsory Primary Education Ordinance (2001)”.

■ Protocol and instruments

Screening of all children was carried out by means of parental questionnaire.

Socio-demographic parent performa (SDPP)

This 13-item Performa was developed based on existing literature and expert discussions. It elicited details like, child age, gender, type of schooling, parental education, parental occupation, age of parents, residential area, informant, name of the head of the household, family income, family type, physical illness/disability, languages spoken at home. The socio economic status was determined on the basis of the categories provided by the Federal Bureau of Statistics, Pakistan [5].

Strengths and difficulties questionnaire (SDQ) is a brief mental health-screening questionnaire that measures 25 attributes, some positive and others negative [8]. The 25 items are grouped into five sub scales of five items each, generating scores for conduct, hyperactivity, emotional, peer problems, and prosocial behaviour. All scales excluding the last are summed to generate a Total Difficulties score (0–40). Category bands and total difficulties scores can be classified as normal, border line and abnormal. These bands which are not adjusted for age or gender have been chosen so that approximately 80% of children in the community are considered to be in normal category, 10% in the borderline and 10% in abnormal category [8]. SDQ can be completed by the parents or the teachers of 4–16 year olds.

Besides common areas of emotional and behavioural difficulties, the extended SDQ also has an impact supplement, inquiring whether the informant thinks that the child has a problem in these

areas and, if so, asks about resulting distress and social impairment [9]. The present study on Pakistani school children has not included the analysis of impact scores. The SDQ has been shown to be of acceptable reliability and validity, performing at least as well as the longer-established Rutter Questionnaires and Child Behaviour Checklist [10]. Originally published in English [9] the SDQ has subsequently been translated into over 40 languages, including Urdu, the national language of Pakistan. (<http://www.sdqinfo.com>). A study to test the validity of the Urdu version of the Strength and Difficulty Questionnaire (SDQ) was carried out in Pakistan [25].

Data collection procedure

The data was collected from January to March 2006 for the private schools and from April to June 2006 for the community schools. In order to obtain consent from schools a meeting was held with the educational authorities and school principals. They were provided with consent forms, an information sheet, and a brief outline of the research procedure and the kind of assistance required by the schools. The materials were available in English, Urdu the national language as well as Sindhi the regional language spoken in some areas of Karachi. For the schools that consented to participate in the study, a meeting was held with the parents and teachers of selected students separately at the school.

Parents were given a short presentation on child mental health disorders explaining the rationale of the study. The purpose of the presentation was to provide awareness as there is a lack of information on child psychiatric problems in the country, as well as encouraging survey participation, and reducing the number of dropouts. SDQ was filled by parents.

As most parents of private school children could read, they filled the questionnaires, however in the community schools majority of parents were uneducated. For those parents needing assistance the principal researcher (SH) along with other interviewers helped fill in the questionnaires. A team of five interviewers assisted with data collection. All had master's degrees with two of them including the principal investigator having master's degree in Psychology. Before data collection, they were all trained by various means in interviewing style, concepts and coding conventions including interviews of volunteers, role-play and recorded interviews. All data was entered into a specially designed database and verified by independent double entry.

■ Statistical analysis

Descriptive statistics were computed for the socio-demographic characteristics of children and parents. Mean and standard deviation of SDQ scores were calculated. Mean SDQ scores for private and public schools, and for male and female children were compared using *t*-tests. The frequency distribution for the 'normal', 'borderline' and 'abnormal' categories on total SDQ and subsets was computed. Subscales ratings were compared with respect to gender and school type using Chi-square test of independence respectively. The association of socio-demographic variables with total SDQ rating was examined using ordinal regression analysis. Data was analysed using the software package SPSS version 14.5 and SAS version 9.1.

Results

Thirty five questionnaires were excluded, as they didn't meet the criteria, (over/under age of child). Data analysis was carried out on 640 parent forms.

Table 1 reports the descriptive statistics for socio-demographic variables. The mean age of the children in the study sample was 8.4 years with standard deviation (SD) of 1.85 years. About 42% children were

Table 1 Socio-demographic variables ($n = 640$)

	n (%)
Gender	
Male	339 (53)
Female	301 (47)
School type	
Private school	271 (42.3)
Community school	369 (57.7)
SES ^a	
Lower	492 (78.6)
Middle	113 (18.1)
Upper	21 (3.3)
Mother education	
Not educated	319 (49.8)
<10 years of schooling	85 (13.3)
10–12 years of schooling	161 (25.2)
Graduate degree/higher	75 (11.7)
Father education ^b	
Not educated	202 (31.6)
<10 years of schooling	120 (18.8)
10–12 years of schooling	166 (25.9)
Graduate degree/higher	151 (23.6)

^amissing data $n = 626$

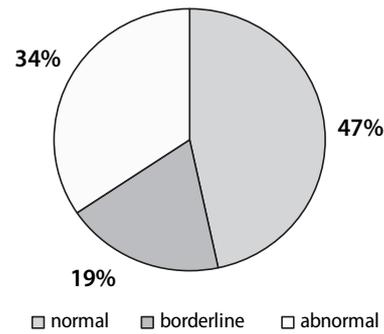
^bmissing data $n = 639$

going to private while 57% were going to the community schools. Mean age of the mothers of these children was 35 years ($SD \pm 7$ years). A total of 50% of mothers and 32% fathers were uneducated. Only 12% of mothers and about 24% of fathers had graduate/higher education. Majority of the mothers were housewives (89%) and belonged to lower socioeconomic status (79%). Ethnically our sample was very diverse. Since languages or dialects represent different ethnic groups in Pakistani culture, spoken language is often the most appropriate determinant of ethnicity. A total of 16 different linguistic or ethnic groups were represented in our sample. Urdu was the language spoken by 42% of the households with 12% Sindhi and Balochi each, 9% Pashto and 7.5% Punjabi. Other respondents reported many different languages spoken in the Subcontinent as their primary means of communication.

Based on parent's rating on SDQ, the mean and standard deviation of scores was 14.4 and 5.9 respectively. The mean score for private schools (13.0) and that for community schools (15.4) were significantly different (P -value = 0.000). The mean scores for male (14.9) and for female (13.8) children were also significantly different (P -value = 0.013).

Parents rated 46.7% as "normal", 18.9% as "Borderline" and 34.4% of children as falling under the "abnormal category on SDQ (Fig. 1). Amongst community school children 40.4% and among private school children 26.2% were rated as 'abnormal'. Among male children 40.1% and among females 27.9% were rated as abnormal.

On the individual behavioural subsets scores 37.3% were rated as abnormal on emotional subset, 42.3% on conduct problems, 18.8% on hyperactivity, and 37.8% on peer problems subset (Table 2). Gender

**Fig. 1** Percentage of children rated Normal, Borderline, Abnormal on SDQ by parents

wise analysis of the individual behavioural subsets rating showed that there was no significant difference between males and females for emotional, peer problems and pro social subsets (Table 2). However there was a highly significant difference for conduct (48.7% of males and 35.2% females were abnormal) and hyperactivity subscales (23.6% males and 13.3% females were abnormal).

School wise analysis of the individual behavioural subsets rating showed that there was a highly significant difference between community and private schools for emotional (31.4% private and 41.7% community school children were abnormal) and conduct problems subsets (29.5% private and 51.8% community school children were abnormal) (Table 2). For hyperactivity, peer problems and prosocial subsets the difference in SDQ ratings were not significantly different between private and community schools (P -value > 0.05). However, for the former two subsets there was a tendency for more hyperactivity and peer problems in community school children compared to private schools as evidenced by the difference in the proportion of abnormal children (Table 2).

Ordinal regression analysis was conducted to identify factors associated with total SDQ behaviour ratings. The univariate ordinal regression analysis is reported in Table 3. The potential predictor variables we considered were gender of the child, school type, mother's education, father's education and socio economic status (SES). In the univariate ordinal regression gender, school type, mother's education and father's education were significant whereas SES was not significant. Variables with P -value less than 25% were selected for inclusion in the multivariable ordinal regression model. The final multivariable regression model is reported in Table 4. Both mother's and father's education were insignificant in the multivariable model, however the former was confounding the effect of school type on the response. Hence the final model included gender, school type and mother's education. The proportional odds assumption for the final ordinal regression model was satisfied (P -value for the score test = 0.329).

Table 2 Number and (percentage) of children rated Abnormal by parents in SDQ subscales ratings; by gender; by school type

SDQ subscales	Male	Female	P-value*	Private	Community	P-value*	Total
Emotional	125 (36.9)	114 (37.9)	0.927	85 (31.4)	154 (41.7)	0.000	239 (37.3)
Conduct	165 (48.7)	106 (35.2)	0.001	80 (29.5)	191 (51.8)	0.000	271 (42.3)
Hyperactivity	80 (23.6)	40 (13.3)	0.000	43 (15.9)	77 (20.9)	0.079	120 (18.8)
Peer problems	133 (39.2)	109 (36.2)	0.733	91 (33.6)	151 (40.9)	0.065	242 (37.8)
Pro social	41 (12.1)	36 (12.0)	0.359	25 (9.2)	52 (14.1)	0.114	77 (12.0)

*P-value is obtained from chi-square test of independence

We interpret the results from the final regression model as follows. The odds of female children of being normal were 1.5 times the odds for male children, adjusting for school type and mother's education (adjusted OR = 1.5, 95% CI: 1.1–2.0). The children attending private schools were more likely to be rated normal on SDQ by parents as compared to community school children, adjusting for child's gender and mother's education (adjusted OR = 2.3, 95% CI: 1.3–4.0) (Table 3).

Discussion

This survey was carried out with the objective to screen the psychological state of school children aged 5–11 years and determine the associated risk factors in Karachi. Most studies report the prevalence of psychiatric morbidity among children from community samples between 10 and 20% [27]. These estimates vary and depend on the instrument used and the study design. Screening tools yield higher results while diagnostic interviews of the screened population often result in lower estimates. A range of 1–51% has

been reported in a review of literature from the past 40 years with a mean prevalence of 15.8% [22].

In our study 34% of all children were categorized as 'abnormal' based on parent's rating on SDQ. Estimates of emotional and behavioural problems may have been higher in our study because these frequencies are being reported based on screening questionnaire alone. A recent study on Sir Lankan school children using similar method showed significantly higher rates of behavioural problems compared to the British population [16].

Since there is a lack of child mental health studies, we reviewed studies in child mental health research from other countries as well as adult literature in Pakistan to determine the risk factors for psychopathology. Based on literature reviews we looked at socio demographic factors associated with psychiatric morbidity among children such as gender, school type and parental education as well as socioeconomic status. According to the present study male gender and attending community school were significantly associated with psychopathology in children aged 5–11 years. Male gender has been consistently reported in literature as a predictor of psychopathology. A

Table 3 Univariate ordinal regression analysis for identifying factors associated with parent's rating of school children (Normal/Borderline/Abnormal), $n = 640$

Variables	Normal	Boderline	Abnormal	Odds ratio	95% CI	P-value ^a
Gender						0.008
Male	147	56	136	1.0	–	
Female	152	65	84	1.5	(1.1, 2.0)	
School type					0.000	
Community	146	74	149	1.0	–	
Private	153	47	71	2.0	(1.4, 2.6)	
Mother's Education						0.005
Not Educated	130	65	124	1.0	–	
>10 years of school	39	13	33	1.1	(0.7, 1.8)	
10–12 years of school	92	27	42	1.9	(1.3, 2.7)	
Graduate/Higher	38	16	21	1.5	(0.95,2.5)	
Father's education ^b						0.004
Not educated	81	42	79	1.0	–	
>10 years of school	47	23	50	0.9	(0.6, 1.4)	
10–12 years of school	88	27	51	1.6	(1.1, 2.3)	
Graduate/Higher	82	29	40	1.8	(1.2, 2.6)	
SES ^c						0.271
Lower	221	99	172	1.0	–	
Middle	60	16	37	1.3	(0.9, 1.9)	
Upper	12	4	5	1.7	(0.7, 3.9)	

^aLikelihood ratio test

^bmissing data $n = 639$

^cmissing data $n = 626$

Table 4 Multivariable ordinal regression analysis for identifying factors associated with parent's rating of school children (Normal/Borderline/Abnormal) ($n = 640$)

Variables	Adjusted odds ratio ^a	95% CI ^a
Gender		
Male	1.0	–
Female	1.5	(1.1, 2.0)
School type		
Community	1.0	–
Private	2.3	(1.3, 4.0)

Likelihood ratio test, P -value < 0.0001

Score test for proportional odds assumption, P -value = 0.329

^aAdjusted for mother's education

higher prevalence among boys was found in most studies except the one conducted in Alain which found a female preponderance [3]. School type has not so far been reported in the literature searched by the authors except one study carried out in Brazil, where similar to our findings the most striking difference by school type was the substantially higher prevalence of psychiatric disorders as a whole among children attending public schools as opposed to private schools [7]. In Pakistani setting community schools are generally over crowded and under funded thus leading to poor quality education and lack of discipline which may result in expression of behavioural problems. In our present study parents of community schools children rated higher estimates of mental health problems amongst their children compared to children attending private schools. Nearly half the number of community school children were rated by their parents with conduct problem (Table 2). The same trend is also seen in the Brazilian study where children attending public schools had a higher prevalence of oppositional—conduct disorders [7].

Limitations of the study

- The sampling unit for the present study was schools, which was most feasible method of recruiting and assessing children in Pakistan, similar to studies in many other developing countries. However it must be noted that not all children in developing countries including Pakistan have access to formal education, therefore the generalizability of findings of this study is limited only to school attending children.
- Most parents in private schools were able to fill out the questionnaires, however parents in community schools were assisted by the researcher in filling out the forms this could have resulted in some bias.
- The selected population was representative of school children in Karachi, however since no record was maintained for the characteristics of non respondents, it could be that the respondents were more motivated

and aware regarding mental health issues.

- The low response rate of the study could be due to the stigma, low literacy levels and a lack of awareness amongst the general population.
- Despite reassurance to the parents, due to a general lack of research culture parents may be apprehensive about the findings and how the results will be dealt with, this could also have lead to a lower response rate.
- Although we gave a brief presentation to the parents proving information on child mental health issues prior to data collection, its important to carry out more awareness campaigns and workshops aiming to sensitise parents towards child psychiatric problems and encouraging participation in research studies. Subsequent studies by the same author has noted that approaching parents on school program like parents-teachers meeting day, improves chances of participation.
- Optimal assessment of child psychopathology is based on multi informants ratings, the present study is based only on parents report. However in Pakistani school setting there are an average of 35 students in a class, this puts a lot of pressure on one teacher to fill out the questionnaires for each child.
- A major limitation of the study is the use of screening tools as a measure to determine prevalence as opposed to a diagnostic interview and therefore resulting in prevalence higher rates.

Conclusions and implications

This survey was carried out with the main aim to better understand the emotional and psychological state of school aged children of Karachi and determine the associations of psychopathology. This exploratory study suggest that estimates of child mental health problems was higher than reported in studies from other countries. Problems were higher amongst children attending community schools. Consistent with most studies risk was greater for males than females. Findings of this study suggest that incorporating mental health problems into the wider spectrum of educational objectives would be beneficial. There is a need especially in community schools to design programs to train, sensitise and mobilize teachers and parents regarding child's psychological, emotional and behavioural problems to be able to at least identify those children most needy of mental health attention, and be able to make appropriate and timely referrals. Also keeping in view the limitations of the present study it is important to carry out further research with multi informants and wider age range.

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