

Social and educational risk factors for child mental health problems in Karachi, Pakistan

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There are limited studies examining risk factors associated with child mental health problems in developing countries. To explore the association between social and educational factors and child mental health problems among primary school age children in Karachi, children aged 5–11 years were randomly selected from 27 mainstream schools in Karachi. The Strengths and Difficulties Questionnaire and a socio-demographic checklist were completed by 968 parents and 793 teachers. Poor physical health, male gender, urban neighbourhood, head of family other than father figure, school type (government and community), lower teacher's qualifications, less teaching experience, poor child school attendance and academic performance were significantly associated with the likelihood of child mental health problems. The multiple factors associated with child mental health in Pakistan are broadly consistent with previous findings from other countries. Public health and education programmes to foster child mental health require multiple targets. As Pakistan does not currently have any organized child mental health services, it is important not only to develop specialist services but also to disseminate basic assessment and treatment skills more widely to other professionals, including teachers and paediatricians, and also to establish strong links between frontline and specialist services.

Keywords: child mental health; risk factors; socio-educational; predictors; Pakistan

Introduction

According to the World Health Organization (WHO), about 10–20% of children worldwide have mental health problems. Furthermore, many of the affected children do not have access to appropriate resources for recognition, support and treatment (Eisenberg & Belfer, 2009; WHO, 2005). In several studies, the overall prevalence of mental disorders among children in high-income countries like Great Britain is around 10%, with this rate rising as high as 20% for problems that may require non-specialist support, particularly in deprived areas (Meltzer, Gatward, Goodman, & Ford, 2000). Similar findings have been established in other Western countries (Costello, Egger, & Angold, 2005) as well as in low-income developing countries such as India (Malhotra, Kohli, & Arun, 2002).

Substantial research literature, mostly from developed countries, suggests a complex socio-economic framework of risk factors operating in multiple contexts that are central to children's lives, namely family, school and neighbourhood (Boys

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et al., 2003; Ford, Goodman, & Meltzer, 2004; Patel, Flisher, Nikapota, & Malhotra, 2007). A few studies from low- and middle-income countries have identified similar factors (Eapen, Al-Gazali, A., Bin-Othman, S., & Abou-Saleh, 1998; Fleitlich & Goodman, 2001; Walker et al., 2007). The child's family environment, including the family type of extended, nuclear or single parent families, has been found to have an important effect on children's mental health. Extended family is known to serve as a protective factor against mental health problems among children, mainly in developing countries (Rahman, Mubbashar, Harrington, & Gater, 2000). Linked to the family environment is the child's wider community. This is an important factor in developing countries, particularly in deprived neighbourhoods (Goodman & Des Santos, 2005; Meltzer, Vostanis, Goodman, & Ford, 2007; Mullick & Goodman, 2005), as poverty is associated with poor health and increased mortality, crime, substance misuse and social exclusion (Heitzman, 2007). The impact of poverty on child mental health appears to be more marked for males than females. Epidemiological and clinical studies consistently show major gender differences in the rates of different types of psychopathology (Maughan, 1989; Rutter, Caspi, & Moffitt, 2003), with the prevalence of externalizing disorders including attention deficit-hyperactive disorder (ADHD) and behavioural disorders being markedly higher in males (Moffitt, Caspi, Rutter, & Silva, 2001). In contrast, internalizing presentations, including emotional and mood disorders are more common among females (Wade, Cairney, & Pevalin, 2002). From the earliest epidemiological UK study conducted by Rutter in the 1970s, a comparison of urban and rural environment demonstrated an excess of child mental health problems in cities, which was largely explained by the concentration of disadvantaged families within these areas (Rutter, Tizard, Yule, Graham, & Whitmore, 1976). Similar trends have been established in other studies from developed (Costello et al., 2005) and developing countries (Goodman & Des Santos, 2005).

School also plays a major role in a child's life. The literature indicates that it is not just the quality of education, but also the type of school environment and climate that can serve both as risk and protective factors for children's mental health (Fleitlich & Goodman, 2004). While many children surmount individual risk factors, those who endure multiple risks simultaneously are more likely to develop mental health problems, as such factors have been found to have a cumulative effect (Essex et al., 2003).

The aim of this study was to establish the relationship between socio-economic factors and emotional and behavioural problems among Pakistani school children. Such findings would be important in the future planning of child mental health and related services.

Methods

Setting

The study was conducted in Karachi, which is located in south-east Pakistan, with a population of 15 million, of which nearly five million were under 16 years old. 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.

Sample

The sampling unit consisted of schools selected from the various districts in Karachi. The educational set-up in Pakistan comprises of public or government run, community (non-governmental organisation) and private schools. In order to maximize the representativeness of the sample, we collected data from all three main school types. Central Karachi has a total of 1380 primary schools located across the city (Federal Bureau of Statistics, 2001). A city-wide list of all primary schools in Karachi was obtained from the educational authorities. They suggested selecting 11 out of the 18 towns in Karachi city, as school authorities in these towns were most likely to co-operate. From each of these 11 towns, one community school was selected. In nine towns we were also able to identify one private school and seven government run schools. Of those 27 schools, 22 agreed to participate, including seven private, seven government and eight community schools. Of the selected schools, five, including two private and three community schools, declined to take part in the study, asserting that the topic might upset parents or was irrelevant to their pupils.

From each school, 100 children were selected, 20 from each class (grade 1–5). If there were less than 20 children in a class, all children were selected, while if there were more than 20, then 20 were selected from each class attendance register, using alternate odd-even serial numbers. Children were eligible for the study if they were over five years of age and had not yet reached their 12th birthday. This range was chosen, as it represents the age for compulsory schooling in Pakistan (Department of Education, 2001).

A total of 2188 children were selected and consent forms and information sheets were sent to their parents. 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. Consent forms were collected by the teachers. Parents who agreed to participate were invited to the school on a later date for data collection. Of parents, 1003 agreed to participate in the study, of whom 35 were excluded due to missing data or the children being outside the age selection criteria. Information from non-respondents was not collected, it was thus not possible to ascertain the characteristics of those invited who did not respond, other than state that they came from the same school population as those who took part. The final analysis was based on 968 parents and 793 teachers who completed SDQ questionnaires and socio-demographic proformas. The response rate was 44%.

Measures

Parents and teachers completed the following questionnaires:

Socio-Demographic Parent Proforma

This 17-item proforma was developed based on existing literature. It elicited details, including: child age, gender, type of schooling, parental education, occupation, age, residential neighbourhood, social class, head of the household, family income, family type, physical illness/disability (past 12 months) and ethnicity. Parental occupation, education and income were rated as categorical variables. Occupation was grouped into five major categories. These included non-earning, business, government

employees, skilled labour and private jobs. Parental education was grouped into four categories based on the education system of Pakistan, including uneducated (no formal education), less than 10 years of schooling, 10 years of schooling and higher education. Monthly household income was grouped into three categories, i.e. low, middle and high income, based on cut-offs provided by the Federal Bureau of Statistics, Government of Pakistan (FBS, 2001).

Teacher Proforma

This was designed to provide information about the child, derived from the teacher and included a four-point rating scale on the child's school performance and attendance. Based on the education system of Pakistan, teachers' qualifications were grouped into four categories: Matric (10 years of schooling), Intermediate (12 years of schooling), undergraduate or Bachelors degree and postgraduate or higher qualification.

Strengths and Difficulties Questionnaire (SDQ)

This well established and validated mental health measure includes 25 attributes, five positive and 20 negative (Goodman, 1997). The 20 difficulties items are grouped into four subscales for conduct, hyperactivity, emotional and peer problems. The SDQ can be completed by parents or teachers of 4–16-year-olds. It has been shown to have acceptable reliability and validity (Goodman & Scott, 1999). Originally published in English (Goodman, 2001), the SDQ has subsequently been translated into over 60 languages, including Urdu, the national language of Pakistan (www.sdqinfo.com). The validity of the Urdu version of the SDQ was previously established in Pakistan (Samad, Hollis, Prince, & Goodman, 2005).

Research procedure

As there was no formal research ethics committee in Pakistan, the study was discussed in detail and approved by the educational, health and welfare authorities. In order to obtain consent from schools, a meeting was initially held with the educational authorities and school principals. They were provided with consent forms, information sheets and a brief outline of the research procedure, including the kind of assistance required by the schools. The materials were available in English, Urdu and Sindhi, the regional language spoken in some areas of Karachi. After the schools had consented to participate, the researcher (SH) identified the sample through the attendance register.

Parents of selected children were sent an information sheet and consent form, asking whether they were willing to participate and whether they gave permission for their child's teacher to be approached. Parents who agreed were invited to a meeting held at the school. They were given a short presentation on child mental health problems and the rationale of the study was explained. Following the presentation, SDQ data was collected from parents. At the same time, teacher SDQ questionnaires were distributed and collected at a later date from the school. As most parents of private school children were educated, they completed the questionnaires; in contrast, the majority of parents in the community and government schools were illiterate. For those parents needing assistance, the principal researcher (SH) and a

group of four research assistants helped them to fill in the questionnaires. The team of five researchers also assisted with data collection. Three had a social sciences master's degree and two, including the principal investigator, had a psychology master's degree. Before data collection, researchers were trained in interviewing techniques, research methods and data coding. Training tools included interviews of volunteers, role-play and recorded interviews. All data was entered into a database and was verified by independent double entry.

Statistical analysis

Descriptive statistics were computed for the socio-demographic characteristics. Analysis of variance tests were carried out to determine the difference between total SDQ continuous scores according to school type and gender. Since the main purpose of this study was to determine the association of different factors with the 'likelihood' of child mental health problems, rather than to establish questionnaire-based prevalence rates, hence a binary regression model was used. Data from the SDQ was recoded into two categories, SDQ abnormal (case) and SDQ normal and borderline (non-case). Data was analysed using the software package SPSS version 14.5 and SAS version 9.1.

Results

Socio-demographic characteristics

The children's median age was 9.0 years (*SD* 1.85, range 5–11). Of those, 28.1% attended private schools, 38.0% community schools and 33.9% attended government schools. The mothers' median age was 35.0 years (*SD* 7, range 20–65); 61.1% of mothers and 35.1% fathers were uneducated. Only 7.9% of mothers and about 16.2% of fathers had graduate/higher education. The majority of mothers were housewives (74.9%) and 81.3% of families were of lower socio-economic status. Most of the teachers had at least an intermediate degree (32.9%), while a small number had a postgraduate degree (11.0%). Of teachers, 38.6% had more than five years of teaching experience and about (8.8%) had less than one year teaching experience. Most of the children resided in urban areas (54.8%) and attended government schools (41.3%). Of the children, 45.2% resided in slums and most of them attended community schools (40.2%). Only 10.2% of the children lived in rural areas, the majority of whom (45.2%) also attended community schools. Parents rated 46.7% as 'normal', 18.9% as 'borderline' and 34.4% of children as falling under the 'abnormal' category on SDQ, whereas teachers rated 36.4% were 'normal', 13.5% 'borderline' and compared to parents slightly higher 'abnormal' ratings, 35.8%, of children on SDQ. Detailed results have been published (Syed, Hussein, & Haidry, 2009).

Child mental health problems according to school type and gender

As the SDQ total scores were normally distributed, analysis of variance was carried out to determine whether there were significant differences between schools and, following those, overall ANOVA post-hoc tests were conducted to ascertain where any differences lay. For parents, the overall ANOVA was significant ($F = 167.2$, [2,965], $p < 0.0001$). Post-hoc tests showed that all pair-wise differences were highly

significant (government versus private: $p < 0.0001$; government versus NGO: $p < 0.0001$; private versus NGO: $p < 0.0001$). However, the overall ANOVA was not significant for teachers' SDQ ratings based on school type ($F = 1.12$, [2, 790], $p = 0.327$).

Gender differences in SDQ ratings according to the two types of informants were also calculated using independent t -tests. For parent SDQ scores, there was a significant difference between males and females, with males scoring higher than females ($t = 2.41$ [1,966], $p = 0.016$). The mean (95% CI) male score was 17.5 (16.9–18.2) and the mean female score was 16.4 (15.7–17.1). For teachers, there was also a significant difference between males and females, with males scoring higher than females ($t = 3.2$ [1,791], $p = 0.0014$). The mean (95% CI) male score was 17.7 (16.8–18.5) and the mean female score was 15.6 (14.7–16.6). The association between parents' and teachers' SDQ ratings was investigated using Pearson's product moment correlation coefficient. There was a significant correlation between parent and teacher total SDQ scores ($r = 0.41$, $p < 0.0001$). This correlation remained significant for the subscales, although this was low for emotional ($r = 0.13$, $p < 0.0003$), moderate for conduct ($r = 0.31$, $p < 0.0001$) and high for hyperactivity scores ($r = 0.56$, $p < 0.0001$).

Association between social-educational variables and SDQ scores: univariate regression analyses

Univariate binary regression analysis was conducted to identify socio-economic factors associated with total SDQ scores. Two separate sets of univariate analyses compared children with SDQ scores within the abnormal range versus those with SDQ scores within the borderline and normal range. Scores were based on parent and total teacher scores, with a range of socio-economic variables as candidate predictors. For parent ratings, factors which significantly increased the odds of being rated as 'case' on the SDQ included individual child-level variables: male gender (OR = 1.38, 95%CI = 1.09–1.76, $p < 0.0077$) and physical illness (OR = 4.10, 95% CI = 2.89–5.83, $p < 0.0001$); school type: government versus NGO (OR = 4.83, 95% CI = 3.52–6.67, $p < 0.0001$), government versus private (OR = 9.43, 95% CI = 6.67–13.33, $p < 0.0001$) and NGO versus private school type (OR = 1.95, 95% CI = 1.45, 2.62, $p < 0.0001$); and family variables, including nuclear family versus extended family (OR = 1.29, 95% CI = 1.01–1.65, $p < 0.0350$), lack of maternal (OR = 1.85, 95% CI = 1.18–2.90, $p < 0.0074$) and paternal education (OR = 1.31, 95% CI = 1.18–2.50, $p < 0.0045$), head of family other than the father (OR = 1.51, 95% CI = 1.17–1.96, $p < 0.0017$), urban neighbourhood (OR = 18.89, 95% CI = 9.2–38.65, $p < 0.0001$) and lower social class (OR = 1.78, 95% CI = 1.43–2.56, $p < 0.0012$). The child's ethnicity and age were not significantly associated with child mental health problems according to parent SDQ ratings.

Based on teachers' SDQ ratings, the following socio-demographic variables were found to be significant predictors of the 'abnormal' SDQ category: male gender (OR = 1.64, 95%CI = 1.25–2.14, $p < 0.0003$), lower teacher qualification (OR = 2.41, 95%CI = 1.51–3.86, $p < 0.0002$), limited teaching experience (OR = 0.38, 95% CI = 0.21–0.67, $p = 0.0008$), poor school attendance (OR = 2.39, 95%CI = 1.69–3.39, $p < 0.0001$) and worse academic performance (OR = 1.71, 95%CI = 1.21–2.42, $p < 0.0024$).

Multivariate regression models

Variables with a *p*-value less than 0.01 were selected for inclusion in the multivariate regression models. The final multivariate regression models are reported in Tables 1 and 2. The multivariate analyses were adjusted for gender and school type, as these two variables were among the sample selection criteria.

Model 1: parent SDQ

The final parent multivariate model was selected using backward stepwise regression. Variables with *p*-values > 0.05 were successively removed from the model in an iterative process which involved re-running the model after each non-significant variable had been removed. Only variables with a *p*-value < 0.05 were retained in the final model (Table 1). Odds (95% CI) of being in a abnormal SDQ category were a consequence of: being male (OR = 1.47, 1.12–1.96, *p* < 0.0054); attending a public rather than NGO (OR = 4.17, 2.94–6.25, *p* < 0.0001) or private school (OR = 8.33, 5.55–12.5, *p* < 0.0001); being physically ill (OR = 2.83, 1.89–4.23, *p* < 0.0001); residing in an urban rather than rural neighbourhood (OR = 46.34, 21.7–99.1, *p* < 0.0001) or slums (OR = 1.73, 1.3–2.3, *p* < 0.0002); and having a head of the family other than the father (all categories significantly worse than father being the head of family).

Model 2: teacher SDQ

The final teacher multivariate model was selected using similar backward stepwise regression (Table 2). Odds (95% CI) of being in a abnormal SDQ category were a consequence of: being male (OR = 1.48, 95%CI = 1.11–1.96, *p* < 0.0078); teacher not having a post-graduate qualification (OR = 3.76, 95%CI = 2.20–6.41, *p* < 0.0001) or having less teaching experience (OR = 0.12, 95%CI = 0.06–0.25,

Table 1. Multivariate regression analysis of association between risk factors and likely child mental health problems based on parent-rated total SDQ scores.

Predictor	Adjusted OR	95% CI	<i>p</i> -value
Gender			
Male versus female	1.48	(1.12, 1.96)	0.0054
School type			< 0.0001*
Government versus NGO	4.17	(2.94, 6.25)	< 0.0001
Government versus private	8.33	(5.55, 12.5)	< 0.0001
Private versus NGO	0.50	(0.36, 0.70)	< 0.0001
Physical illness			
Ill versus not ill	2.83	(1.89, 4.23)	< 0.0001
Neighbourhood			< 0.0001*
Urban versus rural	46.3	(21.7, 99.1)	< 0.0001
Urban versus slums	1.73	(1.3, 2.3)	0.0002
Head of family			< 0.0001*
Grandfather versus Father	1.88	(1.39, 2.54)	< 0.0001
Grandmother versus Father	3.45	(1.44, 8.24)	0.0053
Mother versus Father	2.43	(1.17, 5.03)	0.0172
Other versus Father	2.41	(1.05, 5.41)	0.0324

Note: *Overall group analysis.

Table 2. Multivariate regression analysis of association between risk factors and likely child mental health problems based on teacher-rated total SDQ scores.

Predictor	Adjusted OR	95% CI	<i>p</i> -value
Gender			
Male versus female	1.48	(1.11, 1.96)	0.0078
Teacher qualifications			< 0.0001*
Postgraduate versus Bachelors	1.29	(0.75, 2.21)	0.3501
Postgraduate versus Intermediate	1.50	(0.91, 2.46)	0.1073
Postgraduate versus matric	3.76	(2.20, 6.41)	< 0.0001
Years of teaching experience			< 0.0001*
0–1 versus > 10 years	0.33	(0.14, 0.77)	0.0103
1 versus > 10 years	0.16	(0.07, 0.34)	< 0.0001
2–4 versus > 10 years	0.16	(0.08, 0.32)	< 0.0001
> 5 versus > 10 years	0.12	(0.06, 0.25)	< 0.0001
Attendance			0.0103*
Good versus very good	1.41	(0.93, 2.12)	0.1006
Not satisfactory versus very good	1.62	(1.01, 2.61)	0.0463
Satisfactory versus very good	0.81	(0.48, 1.35)	0.4130
Performance			< 0.0001*
Good versus very good	2.58	(1.69, 3.92)	< 0.0001
Not satisfactory versus very good	2.68	(1.62, 4.43)	0.0001
Satisfactory versus very good	2.90	(1.77, 4.75)	< 0.0001

Note. *Overall group analysis.

$p < 0.0001$); unsatisfactory school attendance (OR = 1.62, 95%CI = 1.01–2.61, $p < 0.0463$); and not having very good academic performance (OR = 2.68, 95%CI = 1.62–4.43, $p < 0.0001$).

Discussion

To date there has been limited knowledge on the nature and extent of socio-economic factors associated with child mental health problems in Pakistan and other developing countries. A previous study conducted in Pakistan that used the Strengths and Difficulties Questionnaire (SDQ) among primary school children, reported elevated rates among Pakistani children compared to studies in other countries using the same instrument (Syed et al., 2007a). Research evidence indicates that child psychiatric disorders have long-term consequences specifically with respect to delinquency, crime and substance abuse. Early recognition and prompt treatment may relieve the psychosocial burden, which will otherwise continue to hamper children's future functioning (Eapen & Abou-Saleh, 2003). This is important in the planning of welfare and health services in countries like Pakistan, where policy makers are faced with difficult choices, constrained by limited resources, in particular specialist services.

The association between school type and child mental health problems has not so far been reported in the literature, except in one study carried out in Brazil where, similar to our findings, the most striking difference was by school type, with the substantially higher prevalence of psychiatric disorders among children attending public as opposed to private schools (Fleitlich & Goodman, 2004). In the Pakistani educational system, government and community schools are generally over-crowded and under-funded, thus leading to poor quality education and lack of discipline,

which may result in behavioural and other mental health problems (Rahman, 2005). In this study, parents of children attending government schools reported higher rates of mental health problems compared to children attending private schools. The same trend was established by the Brazilian study, where children attending public schools had a higher prevalence of conduct disorders (Fleitlich & Goodman, 2004).

Previous research has found that quality of the school environment can serve as a vulnerability factor for learning and emotional problems thus increase the risk for early drop-outs from education (Patel & De Souza, 2000). Other studies examining the causes of school failure have found that behavioural, emotional and learning difficulties constitute prominent risk factors for children, thus both sets of factors can act as cause and effect. For example, an Indian study found that mental health problems were independent risk factors for later school drop-outs (Patel, Flisher, Nikapota et al., 2007). Another case-control study from Brazil reported a strong association between school drop-out and conduct disorder (Tramontina et al., 2001).

These findings can be attributed to the well established relationship between levels of deprivation and the 'quality' of schools in an area (Lupton, 2004, 2005). This is especially important in developing countries, where educational systems are already challenged by inadequate resources, crowded classrooms and inconsistent quality and can be particularly prominent in urban areas. Early research demonstrated an excess of child mental health problems in cities, which was largely explained by the concentration of disadvantaged families (Rutter et al., 1976). This study also found higher rates of mental health problems amongst children living in urban neighbourhoods compared to other areas. Similar trends have been established in other studies from developed (Boyle & Lipman, 2002; Costello, Keeler, & Angold, 2001; Kalff et al., 2001) and developing countries (Goodman & Des Santos, 2005). Rapid urbanization is known to have negative effects on child mental health, through increase in stressful life events, poor social networks and growth of cities because of immigration (Turan, 2008).

The established link between physical and mental health problems was consistent with previous findings from the general population (Ford, Goodman, & Meltzer, 2003; Hysing, Elgen, Gilberg, Lie, & Lundervold, 2007) and clinical studies (Glazebrook, Hollis, Heussler, Goodman, & Coates, 2003). An interesting finding was that, in families where fathers were the head of the family unit the children were better protected against mental health problems; this finding is also in line with earlier studies (Flouri & Buchanan, 2003). This is of particular interest in Pakistan where most families still live in extended units, grandparents often serve as the head of family and the father's role is limited to providing financial support while not playing an active role in the child's emotional development. This finding suggests the need for highlighting the role of fathers in future research and for providing support and early interventions to high risk families.

Of the school related variables investigated, experienced and qualified teachers reported significantly higher rates of emotional and behavioural problems. It is plausible to hypothesize that more experienced teachers may also be more skilled in detecting pupils with mental health problems, as they have better understanding of developmentally appropriate behaviours. This is an important implication for future training, particularly as previous studies have demonstrated that educational interventions can improve the accuracy of both teacher and GP identification of children with mental health problems (Gledhill, Kramer, Iliffe, & Garralda, 2003; Moor et al., 2000). Similar findings have been established for teacher recognition of

ADHD and classroom-based management techniques (Barbarese & Olsen, 1998; Sayal, Hornsey, Warren, MacDiarmid, & Taylor, 2006). In a recent study in Pakistan, qualified teachers who had attended a brief course on child mental health were more able to identify children with behavioural difficulties and to manage such difficulties in the classroom environment (Syed & Hussein, 2009). These findings are particularly relevant to low-income countries with limited mental health resources and where schools and teachers can adopt a more prominent preventive role (Mubbashar, 2003; Syed et al., 2007b; Patel et al., 2007b).

This study has a number of limitations. The sampling unit consisted of schools, which was the most feasible method of recruiting and assessing children in Pakistan, similar to studies in other developing countries. However, it must be noted that a substantial proportion of children in the country do not have access to formal education, therefore the generalizability of the findings of this study is confined to school attending children. Furthermore, the representativeness of the sample may have been affected by the response rate of 44% and the selection of 'educational authorities' that were more likely to agree to the study. Since data from non-respondents was not collected, mainly due to time and financial constraints, it could be that the respondents were more motivated and aware regarding mental health issues, therefore, they could have over-estimated the symptoms.

Most parents in private schools were able to complete the questionnaires, while parents in community and government schools were assisted by the researchers, and this could have resulted in bias. Although we attempted to educate participating parents about potential child mental health problems, the low response rate could be due to stigma, low literacy levels and lack of mental health awareness amongst the general population. Although studies have found that multiple and corroborative informants such as teachers, parents and self-reports by children and young people, offer a more comprehensive and accurate picture of child mental health problems (Ford et al., 2003), the likelihood of child mental health problems associated with teachers' experience and qualifications may be suggestive of confounding, rather than a direct risk factor effect. Further studies should explore teachers' role and impact in more detail. A further drawback was not including the SDQ supplement, which would have provided information on children's impairment. A major limitation was the use of a rating scale as opposed to a diagnostic interview, which should be the focus of future research. This could build on a recent study that adapted the diagnostic interview K-SADS and translated it into Urdu, the official language of Pakistan (Hussein & Vostanis, 2008).

Conclusion

Several policy, service and practice implications can be derived from these findings. Educational institutions represent the most coherent system embracing children and adolescents and provide the predominant venue for health-related interventions (Rahman, 2005). Rahman et al. (2000) demonstrated a feasible and cost-effective school-based programme for children in low-income developing countries. The findings of our study on differences of child mental health problems between the three main school types highlight the importance of providing flexible interventions and services for different educational institutions. There is also an urgent need to train teachers to be able to identify child mental health problems, apply school-based

management techniques and make appropriate and timely referrals of children with more complex disorders to the sparse specialist services.

There are also training implications for both specialist and primary care practitioners (Mubbashar, 2003; Tareen et al., 2009). Children with mental health problems or disorders are regular attenders within primary care and most parents acknowledge that it is appropriate to discuss concerns about psychosocial issues in this setting (Sayal, 2006). This is of particular relevance to developing countries like Pakistan, where primary care serves as the first line of contact for most service users (Mubbashar, 2003). Primary healthcare workers can, therefore, play a crucial role in effective interventions. A study in Pakistan reported that integration of mental health care into primary care can prove cost effective (Chisholm et al., 2000). Further studies are required in Pakistan to investigate the role of primary healthcare in enhancing mental health service provision.

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Panos Vostanis is Professor of Child Psychiatry at the University of Leicester. His research includes the impact of trauma on child mental health; the evaluation of interventions and services, particularly for vulnerable children; and international service evaluation. In his clinical capacity, he provides a mental health service for vulnerable children (in public care, adopted, refugee, homeless, and young offenders).

John Bankart is Lecturer in Medical Statistics at the University of Leicester. His research includes primary care, psychopathology (especially autism), neural networks, respiratory disease, renal disease and non-response bias in mental health surveys.

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