

Trends and factors associated with mental health problems among children and adolescents in Malaysia

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Studying trends in mental health morbidity will guide the planning of future interventions for mental and public health services. To assess the trends in mental health problems among children and adolescents aged 5 through 15 years in Malaysia from 1996 to 2011, data from the children's mental health component of three population-based surveys was analysed using a two-stage stratified sampling design. Mental health problems were assessed using the Reporting Questionnaire for Children. The prevalence of mental health problems among children and adolescents aged 5 through 15 years showed an increasing trend from 13.0% (95% Confidence Interval [CI]: 11.5–14.6) in 1996 to 19.4% (95% CI: 18.5–20.3) in 2006 and 20.0% (95% CI: 18.8–21.3) in 2011. In 2011, male children and adolescents and those who were in less affluent families were significantly associated with mental health problems. The findings indicate that even though mental health problems among children and adolescents in Malaysia are increasing, the rate of increase has decreased in the past five years. Socially and economically disadvantaged groups were most vulnerable to mental health problems.

Keywords: trend; mental health; National Health and Morbidity Survey; RQC; Malaysia

Introduction

The World Health Organisation defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1946). Although adolescents are generally perceived as a healthy group, 20% of them, in any given year, experience a mental health problem, most commonly depression or anxiety (WHO, 2012). Emotional health and wellbeing of adolescents have implications on self-esteem, behaviour, attendance at school, educational achievement, social connectedness and quality of health (Rao, 2001). Adolescents with a good sense of mental well-being possess problem-solving skills, social competence and a sense of purpose. These assets make them resilient and help them thrive in the face of adverse circumstances. They then avoid risk-taking behaviour and generally lead productive lives (Nintachan, 2007).

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Antecedents to mental disorders in adults can be detected in children and adolescents. Studying trends in mental health morbidity will guide future directions in planning interventions for mental and public health services. Studies in Asian countries have revealed that the prevalence of mental health problems among children and adolescents ranges from 10 to 20% (Amstadter et al., 2011; Farbstein et al., 2010; Khan et al., 2009; Leung et al., 2008; Mullick & Goodman, 2005; Srinath et al., 2005; Syed, Hussein, & Mahmud, 2007; Woo et al., 2007). Srinath et al. (2005) also reported that adolescents from urban areas had a higher prevalence of mental disorders. Mental health problems also associated with males, marital discord and lower socioeconomic status.

In Malaysia, mental health services for children were mainly provided in over 30 general hospital psychiatric units situated throughout the country. The services were mainly provided by general psychiatrists and less than 10 child psychiatrists. Since early-2000, the services have been integrated into primary care through the establishment of primary care mental health services (Parameshvara Deva, 2004). However, a review based on quantitative estimates, suggested a total of 1.4 million children in Malaysia with mental health difficulties that interfere with normal functioning and development did not receive adequate services for intervention (Peters, 2010).

To date, there is no report looking into the trend of mental health problems among children and adolescents in Malaysia. This article aims to look at the trend of mental health problems among children and adolescents based on the three large-scale, community-based surveys conducted in Malaysia over a 15-year period.

Methodology

Sample and design

The data was extracted from three nationwide community-based studies, namely the National Health and Morbidity Survey (NHMS) 1996, 2006 and 2011 (Institute for Public Health [IPH], 1997a, 2006, 2011). These surveys were done at particular intervals to provide data to policy makers to review health priorities and evaluate the implemented programmes. The mental health of children and adolescents was one of the areas covered in the surveys. Care-givers assessment of the mental health of their respective children and adolescents were done in all three cross-sectional surveys using a validated self-administered questionnaire (IPH, 1997b). The questionnaire was translated to *Bahasa Malaysia* and back-translated to English in 1996. A validation study done in 1996 noted a sensitivity and specificity of 91 and 82%, respectively (IPH, 1997b). All three surveys examined the mental health of children and adolescents residing in randomly selected non-institutional living quarters in Malaysia. The NHMS 1996 examined a representative sample of 14,550 5–16-year-olds, while NHMS 2006 examined 11,949 5–16-year-olds and NHMS 2011 examined another 5768 children and adolescents in the same age group. The 1996 and 2006 surveys aimed to analyse data up to the state level, while the 2011 survey only aimed to analyse up to the national level, hence the reduction in the sample size. The surveys used multi-stage stratified sampling design involving all residents, where children and adolescents within the specified age group from selected living quarters were included. Consent was obtained from the parents or caregivers at the beginning of the data collection process. All surveys were reviewed and approved by the Medical Research and Ethics Committee Ministry of Health Malaysia (NMRR-10-757-6837). Details of the sampling strategy are provided in the respective NHMS reports (13–15).

Study instrument

The bilingual Reporting Questionnaire for Children (RQC) was completed by the caregivers of the respective children and adolescents. The RQC is a 10-item instrument, developed as part of a World Health Organization (WHO) collaborative study involving seven countries in 1981 (Giel et al., 1981). The tool was designed as part of a two-stage screening and assessment protocol. The RQC was intended to be a first stage screen for developmental disability, significant degrees of emotional and behavioural disorder and psychotic disorders in children and adolescents in the age group 5 to 16 years (Giel et al., 1981). The child or adolescent was considered to be having a mental health problem if a positive response was found on any of 10 listed items.

The items include:

- Is the child's speech in any way abnormal? (retarded, incomprehensible, stammering)
- Does the child have sleep problems?
- Did the child ever have fit or fall to the ground for no apparent reason?
- Does the child suffer from frequent headaches? (at least twice a week over a period of one month or more)
- Does the child run away from home frequently? (on three or more occasions)
- Does the child steal things from home?
- Does the child get scared or nervous for no good reason?
- Does the child in any way appear backward or slow to learn when compared with other children of about the same age?
- Does the child nearly never play with other children?
- Does the child wet or soil him/herself? (more than three times a month in children more than seven years old)

In all three NHMS, the RQC was used as the screening instrument. No second stage was performed.

Analysis

As the sampling was multi-stage stratified in design, the analysis was done accordingly to ensure sample weight and design effect were accounted for during the analysis. The overall prevalence of mental health problems as well as the prevalence of positive responses in each item was determined. Bivariate analysis was done looking into the association between independent variables and mental health problems. Prevalence of mental health problems by socio-demographic profiles in the three surveys was then compared to look for any trend. Comparison of the findings is possible as the three surveys used the same methodology.

For the year 2011, a multivariable logistic regression model was fitted to assess factors related to mental health problems. The variables independently associated with mental health problems versus no mental health problems that were analysed included locality, sex, ethnicity, household income, age group, guardian's education level and guardian's marital status. Urban, male, Malay, income quartile 4, age group five-to-six years, guardian's tertiary education level and guardian's single marital status were chosen as the categories of reference for the independent variables. As the dependent variable was dichotomous, we used a logistic regression model to produce crude odds ratios (OR) as a measure of association. The ENTER variable selection method was used to obtain significant variables in the model. The statistical significance of the individual regression

coefficient was tested using Wald chi-square statistic. The adjusted OR, with their respective 95% confidence intervals (CIs), was then calculated. A *p*-value of less than 0.05 was considered significant.

Variables definition

Age groups were classified based on the Malaysian education system. In Malaysia, children from the ages of five to six years are in pre-school, children from the ages of seven to nine years are in lower-primary, while children from the ages of 10 to 12 years are in upper-primary school. Children from the ages of 13 to 15 years are in lower-secondary school.

In our surveys, ethnicity was classified based on three major ethnic groups in the country, namely Malay, Chinese and Indian, followed by 'Other Bumiputra' and 'Other'. Other Bumiputra comprises indigenous groups and local Sabahans and Sarawakians, while 'Other' was mostly foreigners, immigrants, both legal and illegal, residing in Malaysia.

Education levels of the caregivers were also based on the Malaysian education system. Caregivers of the respondents were considered as having no formal education if they had not attended any formal schooling. Those who had completed up to six years of primary school were considered as having attained primary education, while those who had completed 11 years of formal schooling were considered as having attained secondary education. Caregivers of the respondents with diploma or higher qualifications were considered as having attained tertiary education.

Results

Comparing the sociodemographic profile of the respondents from the three surveys, the percentage by sex was similar in all. By age group, there were more respondents from the younger age group in 1996 compared to more respondents from the older age group in the years 2006 and 2011. A detailed sociodemographic profile is shown in [Table 1](#).

The prevalence of mental health problems among children and adolescents aged 5–15 years increased 49.2% from 13.0% (95% CI: 11.5–14.6) in 1996 to 19.4% (95% CI: 18.5–20.3) in 2006, and 20.0% (95% CI: 18.8–21.3) in 2011.

By sex, the prevalence was significantly higher in males compared to females in NHMS 2006 and NHMS 2011. The trend was similar from 1996 to 2006, with 53.2% increment among males and 57.0% increment among females. From 2006 to 2011, the prevalence showed an improvement among females ([Table 2](#)).

In 1996 and 2006 there was a direct relationship between the prevalence of mental health problems and age groups up to the 10–12-year-old group. In 2011, the prevalence was higher among the 5–6 and the 13–15-year-old groups. In the 5–6-year-old group, the prevalence almost doubled from 1996 to 2006. The prevalence among the 7–9-year-old and the 10–12-year-old groups increased 54.5 and 33.5%, respectively, from 1996 to 2006. Among the 13–15-year-old group, the prevalence showed an increment throughout the three surveys. In this group the prevalence almost doubled in 2011 compared to 1996.

By ethnicity, the prevalence of mental health problems was significantly lowest among Chinese in 1996, and remained lowest in 2006 and 2011. The prevalence was highest among 'Other Bumiputra' in 1996 and 2011, and among Indian in 2006. The prevalence among Chinese increased tremendously (a 366.7% increment) from 1996 to

Table 1. Sociodemographic profiles of the respondents, NHMS 1996, NHMS 2006 and NHMS 2011.

Variable	NHMS 1996 N (%)	NHMS 2006 N (%)	NHMS 2011 N (%)
Sex			
Male	7370 (51.5)	7217 (51)	3278 (51.2)
Female	6929 (48.5)	6939 (49)	3130 (48.8)
Age group (years)			
5–6	4189 (28.8)	2737 (19.3)	1069 (16.7)
7–9	2945 (20.2)	3980 (28.1)	1835 (28.6)
10–12	6435 (44.2)	4036 (28.5)	1800 (28.1)
13–15	980 (6.8)	3403 (24)	1704 (26.6)
Ethnicity			
Malay	7725 (53.8)	8691 (61.4)	4077 (63.6)
Chinese	2601 (18.2)	2069 (14.6)	939 (14.7)
Indian	831 (5.8)	1006 (7.15)	431 (6.7)
Other Bumiputra	2692 (18.7)	1962 (13.9)	739 (11.5)
Other	509 (3.5)	428 (3.0)	222 (3.5)
Locality			
Urban	7783 (51.1)	7702 (54.4)	3588 (56)
Rural	7440 (48.9)	6454 (45.6)	2820 (44)
Caregiver's highest education level			
No formal education	83 (1.4)	493 (3.5)	168 (4.5)
Primary education	2452 (16.1)	2001 (14.1)	737 (19.9)
Secondary education	2512 (16.5)	3822 (27)	1880 (50.8)
Tertiary education	706 (12.3)	3403 (24.0)	836 (22.6)
Caregiver's marital status			
Not married	89 (1.3)	167 (1.3)	67 (1.1)
Married	6032 (91.5)	11927 (92.3)	5348 (91.2)
Divorcee/widow/widower	470 (7.1)	823 (6.4)	450 (7.7)
Household income by quartile ^a			
Quartile 1	1459 (25.1)	3438 (24.3)	1602 (25)
Quartile 2	1490 (25.6)	3423 (24.2)	1609 (25.1)
Quartile 3	1552 (26.7)	3423 (24.2)	1599 (25)
Quartile 4	1308 (22.5)	3425 (24.2)	1598 (24.9)

^aQuartile: quartile 1 represents the lowest quarter; quartile 4, the highest.

2006, but improved from 2006 to 2011. Among 'Other Bumiputra' and 'Other', ethnicity the prevalence decreased 13.1 and 26.2%, respectively, from 1996 to 2006 but increased 36.6 and 76.5%, respectively, from 2006 to 2011.

In NHMS 1996, the prevalence of mental health problems was significantly higher in rural areas compared to urban areas. However there was no significant difference in the prevalence by locality in 2006 and 2011. The prevalence of mental health problems in urban localities in 2006 almost doubled that of 1996. From 2006 to 2011, the prevalence decreased. In rural localities, the prevalence increased by 36.8% from 1996 to 2006 and did not increase further from 2006 to 2011.

In 2006, the prevalence of mental health problems was lower among children of caregivers with no formal education and those with tertiary education, as well as children

Table 2. Prevalence of mental health disorders and rates of increase by sociodemographic profile, NHMS 1996, NHMS 2006 and NHMS 2011.

	NHMS 1996	Rate of increase (%)	NHMS 2006	Rate of increase (%)	NHMS 2011
	(95% CI)	1996 to 2006	% (95% CI)	2006 to 2011	% (95% CI)
Sex					
Male	14.1 (12.1–15.9)	+53.2	21.6 (20.4–22.8)*	+0.9	21.8 (21.1–23.7)*
Female	12.1 (10.1–14.1)	+57.0	19.0 (17.9–20.2)	–4.7	18.1 (16.4–20.0)
Age group (years)					
5–6	9.7 (7.5–11.9)	+87.6	18.2 (16.7–19.8)	+6.6	19.4 (16.3–23.0)
7–9	12.3 (9.7–14.9)	+54.5	19.0 (17.6–20.4)	–0.5	18.9 (16.4–21.7)
10–12	15.5 (13.4–17.5)	+33.5	20.7 (19.4–22.1)	–9.7	18.7 (16.6–21.1)
13–15	13.4 (9.0–17.9)	+43.3	19.2 (17.7–20.7)	+22.4	23.5 (20.6–26.6)
Ethnicity					
Malay	11.9 (9.9–13.9)	+71.4	20.4 (19.3–21.6)	–10.3	18.3 (16.9–19.8)
Chinese	3.6 (0.6–6.6)	+366.7	16.8 (14.7–19.1)	–13.7	14.5 (11.9–17.6)
Indian	24.6 (18.1–31.2)	+8.5	26.7 (22.8–30.9)	+1.9	27.2 (22.1–32.9)
Other	23.6 (20.1–27.1)	–13.1	20.5 (18.0–23.2)	+36.6	28.0 (23.8–32.6)
Bumiputra					
Other	27.1 (18.3–36.0)	–26.2	20.0 (15.8–25.0)	+76.5	35.3 (25.8–46.1)
Locality					
Urban	10.5 (8.4–12.7)	+87.6	19.7 (18.5–21.0)	–2.5	19.2 (17.6–20.9)
Rural	15.5 (13.3–17.7)*	+36.8	21.2 (19.9–22.7)	+2.4	21.7 (19.8–23.8)
Caregiver's highest education level					
No formal education	15.4 (10.6–20.0)	–19.5	12.4 (9.6–15.9)	+170.2	33.5 (24.1–44.3)
Primary education	14.9 (14.0–15.7)	+24.2	18.5 (16.7–20.3)	+57.8	29.2 (25.2–33.6)
Secondary education	13.4 (12.5–14.2)	+62.7	21.8 (20.4–23.2)	+31.2	28.6 (26.0–31.3)
Tertiary education	9.0 (7.7–10.1)	+55.6	14.0 (11.8–16.6)	+52.9	21.4 (18.2–24.9)
Caregiver's marital status					
Not married	17.4 (12.5–22.2)	–47.1	9.2 (5.1–16.1)	+115.2	19.8 (9.8–36.0)
Married	13.7 (13.1–14.4)	+45.3	19.9 (18.9–20.9)	+2.0	20.3 (18.6–22.2)
Divorcee/ widow/ widower	15.5 (13.4–17.5)	+8.4	16.8 (14.0–20.0)	+16.1	19.5 (14.6–25.7)
Household income by quartile^a					
Quartile 1	17.2 (16.0–18.4)	+10.5	19.0 (17.2–21.0)	+29.5	24.6 (21.1–28.5)
Quartile 2	14.1 (13.0–15.2)	+50.1	21.2 (19.5–23.1)	–1.4	20.9 (17.9–24.2)
Quartile 3	12.6 (11.4–13.7)	+67.5	21.1 (19.3–22.9)	–9.0	19.2 (16.4–22.2)
Quartile 4	11.3 (10.2–12.4)	+51.3	17.1 (15.6–18.7)	–7.6	15.8 (13.5–18.5)

CI = confidence interval; ^aquartile 1 represents the lowest quarter; quartile 4, the highest; *significant difference ($p < 0.05$).

from families with the lowest and highest household incomes. In 1996 and 2011, by categories of level of education as well as for household income, there was an inverse relationship in the prevalence of mental health problems. The prevalence among children of caregivers with no formal education almost tripled from 2006 to 2011, while the prevalence among children in lowest household income increased by 29.5% during the similar period (Table 2).

Results from the logistic regression analysis based on the NHMS 2011 indicate that male children and adolescents and those who were from less affluent families were significantly associated with a mental health problem. By ethnicity, ‘Other’ were 2.4 times more likely to have a mental health problem, while ‘Indian’ and ‘Other Bumiputra’ were 68 and 58% more likely to have a mental health problem, respectively (Table 3).

Table 3. Factors associated with mental health problems among children, NHMS 2011.

	Crude OR (95%CI)	Wald test	Adjusted OR (95%CI)	p-value
Locality				
Urban	1			NS
Rural	1.13 (1.0–1.29)			
Sex				
Male	1	15.621	1.30 (1.14–1.48)	< .001
Female	1.29 (1.13–1.46)			
Ethnicity				
Malay	1			
Chinese	0.77 (0.62–0.95)	4.555	0.79 (0.65–0.98)	.033
Indian	1.65 (1.30–2.09)	18.500	1.68 (1.33–2.13)	< .001
Other Bumiputra	1.70 (1.40–2.05)	21.703	1.58 (1.31–1.92)	< .001
Other	2.59 (1.92–3.49)	33.220	2.44 (1.80–3.30)	< .001
Household income by quartile^a				
Quartile 1 ≤ 680.00	1.64 (1.36–1.96)	15.697	1.46 (1.21–1.76)	< .001
Quartile 2 680.01–1250.00	1.34 (1.11–1.61)	5.187	1.25 (1.03–1.51)	.023
Quartile 3 1250.01–2200.00	1.16 (0.95–1.39)	.922	1.10 (0.91–1.33)	NS
Quartile 4 2200.01+	1			
Age group (years)				
5–6	1			
7–9	0.98 (0.8–1.2)			
10–12	1.11 (0.91–1.34)			NS
13–15	1.35 (1.1–1.64)			
Guardian’s education level				
No formal education	1.32 (0.89–1.96)			NS
Primary education	1.51 (1.18–1.91)			
Secondary education	1.37 (1.12–1.67)			
Tertiary education	1			
Guardian’s marital status				
Not married	1			NS
Married	0.83 (0.45–1.51)			
Divorcee/widow/widower	0.85 (0.44–1.63)			

OR = odds ratio; NS = not significant; ^aquartile 1 represents the lowest quarter; quartile 4, the highest.

Discussion

Mental health problems among children and adolescents in Malaysia demonstrated an upward trend from 1996 to 2006 and appear to have improved between 2006 and 2011. In Malaysia, the increased prevalence of mental health problems from 1996 to 2006 may be due to heightened awareness among caregivers as a result of the various mental health promotional programmes conducted nationwide since 2000 (Ministry of Health, Malaysia, 2012). The improvement in prevalence from 2006 to 2011 might be related to the implementation of various strategies by the Ministry of Health, Malaysia, and non-government agencies. The Ministry of Health, Malaysia, has restructured the mental health services, with the integration of the mental health services at the primary-care level in the 1995 (Parameshvara Deva, 2004). Furthermore, since 2001, Ministry of Education, Malaysia, has implemented a special education programme to address the needs of children with learning disorders, which is one of the most prevalent mental health problems among children (Peters, 2010). Other non-government organizations, such as Malaysian Mental Health Association and other societies, have also play their role in creating public awareness and advocacy for provision of better mental health services (MMHA, 2012).

The prevalence in 2006 and 2011, however, is higher than the prevalence in Singapore (12.5%) in 2007 (Woo et al., 2007) but lower than in India (24.5%) in 2005 (Srinath et al., 2005). The difference in these rates should be interpreted with caution as these two studies used a different methodology to our surveys. The increasing trend of mental health problems among children and adolescents is also seen in the UK (Collishaw, Maughan, Goodman, & Pickles, 2004; Maughan, Iervolino, & Collishaw, 2005). This increase in mental health problems could be due to factors such as drastic changes in lifestyle, the negative effect of media and increased awareness among parents resulting in increased reporting (Al-Sharbati, Al-Hussaini, & Antony, 2003; Collishaw et al., 2004). In the USA, on the other hand, a negative trend was noted from 2001 to 2007 (Pastor, Reuben, & Duran, 2012).

There is extensive literature to suggest that being a male child or adolescent predicts psychopathology (Canino et al., 2004; Ford, Goodman, & Meltzer, 2003; Heiervang et al., 2007; Pastor et al., 2012; Ravens-Sieberer et al., 2008; Syed et al., 2007). In Malaysia, this association was noted in the 2006 and 2011 surveys.

Mental health problems among children of five-to-six years of age almost doubled from 1996 to 2006. Several factors may be contributory to this. In 1997 to 1998, Malaysia and several other countries underwent a severe economic crisis, which resulted in widespread social and economic problems (Knowles, Pernia, & Racelis, 1999). Some of the social problems that emerged included family difficulties, parental separation and divorce and the breakdown of traditional styles of parenting. These, coupled with the economic problems, may have resulted in this increase. In addition, the increasing awareness of mental health problems by caregivers probably resulted in improved recognition and reporting of psychopathology in their children.

By ethnicity, the prevalence of mental health problems among Chinese tripled between 1996 and 2006. This increase might not be a true increment. The low prevalence among Chinese in 1996 was probably underreported. Various studies revealed that mental illness among Chinese was very much stigmatised, and parents possibly refused to disclose their children's symptoms (Yang, 2007; Yang & Kleinman, 2008). Based on the survey in 2006, it was postulated that the perception of and attitude to mental health among Chinese parents has changed as a result of effective health promotion.

Furthermore, there was no significant difference in the mental health problems in Chinese compared to the Malays in 2011. Analysis using logistic regression for data in 2011 noted a higher prevalence of mental health problems among Indians, 'Others' and 'Other Bumiputra' as compared to Malays. The difference in the prevalence by different ethnic groups is also seen in other studies (Green, McGinnity, Meltzer, Ford, Goodman, 2004; Samaan, 2000). In Malaysia, this might be due to the ethnic groups mentioned above being mainly in the more disadvantaged and economically less affluent quarters of Malaysian society. This could result in higher childhood adversities in the said ethnic groups.

Studies have revealed mixed evidence with regard to urban/rural locality (Cortina, Sodha, Fazel, & Ramchandani, 2012; Fleidich & Goodman, 2001; Howell & McFeeters, 2008). However, our three surveys revealed no difference by locality. Accessibility in Malaysia for basic health needs is generally regarded to be comparable to developed countries. This could be one of the reasons for the similar findings. The presence of urban slum areas and the rural poor could be another plausible reason for the lack of difference in the two localities.

There appears to be a negative relationship between caregiver's educational level and the prevalence of mental health problems. This inverse relationship is also noted between household income and prevalence of mental health problems in the children and adolescents. Similar findings have also been reported in several studies (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Pastor et al., 2012; Samaan, 2000; Syed et al., 2007).

Strengths and limitations

The use of a large nationally representative sample in all three surveys with similar sampling design allowed for reliable trending studies spanning 15 years. The three surveys also used the same validated tool (RQC), which has unambiguous questions, which are easy to answer and related to recognizable aspects of the behaviour of the child. Another strength is that the findings from these surveys were used by policy makers and programme managers in the planning and implementation of preventive measures to tackle mental health problems in Malaysia.

One limitation of this article is the cross-sectional nature of these surveys, which prevents the identification of causal relationships between identified factors with mental health problems. Another limitation of these surveys is the absence of a second-stage interview/assessment to identify the psychiatric diagnoses. Certain sociodemographic profiles, for example, caregiver's highest education level, marital status and household income in 1996, could not be compared with 2006 and 2011 due to the unavailability of one database with both caregivers and children data in the 1996 survey.

Conclusion

This article examines trends in mental health problems among children and adolescents in Malaysia from 1996 to 2011. The findings indicate that these problems have improved in the past five years but are still a cause of concern and a challenge to public health work. The socially and economically disadvantaged groups appear to be the most vulnerable to mental health problems. This study underscores the importance of focusing mental health services towards this group.

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References

- Al-Sharbati, M. M., Al-Hussaini, A. A., & Antony, S. X. (2003). Profile of child and adolescent psychiatry in Oman. *Saudi Medical Journal*, *24*(4), 391–395.
- Amstadter, A. B., Richardson, L., Meyer, A., Sawyer, G., Kilpatrick, D. G., Tran, T. L., ... Aciermo, R. (2011). Prevalence and correlates of probable adolescent mental health problems reported by parents in Vietnam. *Social Psychiatry and Psychiatric Epidemiology*, *46*(2), 95–100. doi:10.1007/s00127-009-0172-8
- Canino, G., Shrout, P. E., Rubio-Stipec, M., Bird, H. R., Bravo, M., Ramirez, R., ... Martinez-Taboas, A. (2004). The DSM-IV rates of child and adolescent disorders in Puerto Rico: prevalence, correlates, service use, and the effects of impairment. *Archives of General Psychiatry*, *61*(1), 85–93. doi:10.1001/archpsyc.61.1.85
- Collishaw, S., Maughan, B., Goodman, R., & Pickles, A. (2004). Time trends in adolescent mental health. *Journal of Child Psychology and Psychiatry*, *45*, 1350–1362. doi:10.1111/1469-7610.2004.00842
- Cortina, M. A., Sodha, A., Fazel, M., & Ramchandani, P. G. (2012). Prevalence of child mental health problems in Sub-Saharan Africa: A systematic review. *Archives of Pediatrics and Adolescent Medicine*, *166*, 276–281. doi:10.1001/archpediatrics.2011.592
- Costello, E., Mustillo, S., Erkanli, A., Keeler, G., & Angold A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, *60*, 837–844. doi:10.1001/archpsyc.60.8.837
- Farbstein, I., Mansbach-Kleinfeld, I., Levinson, D., Goodman, R., Levav, I., Vograft, I., ... Apter, A. (2010). Prevalence and correlates of mental disorders in Israeli adolescents: Results from a national mental health survey. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *51*, 630–639. doi:10.1111/j.1469-7610.2009.02188.x
- Fleidich, B., & Goodman, R. (2001). Social factors associated with child mental health problems in Brazil: Cross sectional survey. *British Medical Journal*, *323*, 599–600. doi:10.1136/bmj.323.7313.599

- Ford, T., Goodman, R., & Meltzer, H. (2003). The British Child and Adolescent Mental Health Survey 1999: The prevalence of DSM-IV disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42, 1203–1211. doi:10.1097/01.chi.0000081820.25107.ac
- Giel, R., de Arango, M. V., Climent, C. E., Harding, T. W., Ibrahim, H. H., Ladrado-Ignacio, L., ... Younis, Y. O. (1981). Childhood mental disorders in primary health care: Results of observations in four developing countries. A report from the WHO collaborative Study on Strategies for Extending Mental Health Care. *Pediatrics*, 68(5), 677–683.
- Green, H., McGinnity, A., Meltzer, H., Ford, T., Goodman, R. (2004). Mental health of children and young people in Great Britain. Retrieved from www.statistics.gov.uk
- Heiervang, E., Stormark, K. M., Lundervold, A. J., Heimann, M., Goodman, R., Posserud, M., ... Gillberg, C. (2007). Psychiatric disorders in Norwegian 8- to 10-year-olds. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(4), 438–447. doi:10.1097/chi.0b013e31803062bf
- Howell, E., & McFeeters, J. (2008). Children's mental health care: Differences by race/ethnicity in urban/rural areas. *Journal of Health Care for the Poor and Underserved*, 19, 237–247. doi:10.1353/hpu.2008.0008
- Institute for Public Health. (1997a). *National Health and Morbidity Survey II (NHMS II). Volume 1: The Scope and Methodology of the Survey*. Kuala Lumpur: Ministry of Health Malaysia.
- Institute for Public Health. (1997b). *National Health and Morbidity Survey. Volume 7: Psychiatric morbidity in children and adolescents*. Kuala Lumpur: Ministry of Health Malaysia.
- Institute for Public Health. (2006). *National Health and Morbidity Survey III (NHMS III)*. Kuala Lumpur: Ministry of Health Malaysia.
- Institute for Public Health. (2011). *National Health and Morbidity Survey 2011 (NHMS 2011). Volume 1: Methodology and general findings*. Kuala Lumpur: Ministry of Health Malaysia.
- Khan, N. Z., Ferdous, S., Islam, R., Sultana, A., Durkin, M., & McConachie, H. (2009). Behaviour problems in young children in rural Bangladesh. *Journal of Tropical Pediatrics*, 55(3), 177–182. doi:10.1093/tropej/fmn108
- Knowles, J. C., Pernia, E. M., & Racelis, M. (1999). *Social consequences of the financial crisis in Asia*. Papers. (60). Manila: Asian Development Bank.
- Leung, P. W., Hung, S. F., Ho, T. P., Lee, C. C., Liu, W. S., Tang, C. P., & Kwong, S. L. (2008). Prevalence of DSM-IV disorders in Chinese adolescents and the effects of an impairment criterion: a pilot community study in Hong Kong. *European Child and Adolescent Psychiatry*, 17, 452–461. doi:10.1007/s00787-008-0687-7
- Parameshvara Deva, M. (2004). Malaysia mental health country profile. *International Review of Psychiatry*, 16, 167–176. doi:10.1080/09540260310001635203
- Maughan, B., Iervolino, A. C., & Collishaw, S. (2005). Time trends in child and adolescent mental disorders. *Current Opinion in Psychiatry*, 18, 381–385. doi:10.1097/01.yco.0000172055.25284.f2
- Ministry of Health, Malaysia. (2012). Mental Health Promotion. Retrieved from www.infosihat.gov.my/infosihat/kchs/KCHS_2000/index.php
- MMHA. (2012). Malaysian Mental Health Association. Retrieved from <http://www.mentalhealth.org.my/index.cfm?menuid=3>
- Mullick, M. S., & Goodman, R. (2005). The prevalence of psychiatric disorders among 5–10 year olds in rural, urban and slum areas in Bangladesh: An exploratory study. *Social Psychiatry and Psychiatric Epidemiology*, 40, 663–671. doi:10.1007/s00127-005-0939-5
- Nintachan, P. (2007). *Resilience and risk-taking behavior among Thai adolescents living in Bangkok, Thailand* (Ph.D). Richmond, VA: Virginia Commonwealth University. (AAT 3283115)
- Pastor, P. N., Reuben, C. A., & Duran, C. R. (2012). *Identifying emotional and behavioral problems in children aged 4–17 years: United States, 2001–2007* (National health statistics report no. 48). Hyattsville, MD: National Center for Health Statistics.
- Peters, Huberta. (2010). Mental health: Special needs and education. *Asean Journal of Psychiatry*, 11(1; June), 1–7.
- Rao, M. (2001). Promoting childrens emotional well-being by Ann Buchanan and Barbara Hudson [Book review]. *Journal of Public Health Medicine*, 23(2), 168–169. doi:10.1093/pubmed/23.2.168
- Ravens-Sieberer, U., Wille, N., Erhart, M., Bettge, S., Wittchen, H. U., Rothenberger, A., ... Döpfner, M. (2008). Prevalence of mental health problems among children and adolescents in Germany: Results of the BELLA study within the National Health Interview and Examination Survey. *European Child and Adolescent Psychiatry*, 17(Suppl 1), 22–33. doi:10.1007/s00787-008-1003-2

- Samaan, R. A. (2000). The influences of race, ethnicity, and poverty on the mental health of children. *Journal of Health Care for the Poor and Underserved, 11*(1), 100–110. doi:[10.1353/hpu.2010.0557](https://doi.org/10.1353/hpu.2010.0557)
- Srinath, S., Girimaji, S. C., Gururaj, G., Seshadri, S., Subbakrishna, D. K., Bhola, P., & Kumar, N. (2005). Epidemiological study of child & adolescent psychiatric disorders in urban & rural areas of Bangalore, India. *Indian Journal of Medical Research, 122*(1), 67–79.
- Syed, E. U., Hussein, S. A., & Mahmud, S. (2007). Screening for emotional and behavioural problems amongst 5–11-year-old school children in Karachi, Pakistan. *Social Psychiatry and Psychiatric Epidemiology, 42*(5), 421–427. doi:[10.1007/s00127-007-0188-x](https://doi.org/10.1007/s00127-007-0188-x)
- WHO. (1946, June 19–22). *Preamble to the constitution of the World Health Organization*. Adopted by the International Health Conference, New York. Geneva: Author.
- WHO. (2012). *Adolescent mental health: Mapping actions of nongovernmental organizations and other international development organizations*. Geneva: Author.
- Woo, B. S., Ng, T. P., Fung, D. S., Chan, Y. H., Lee, Y. P., Koh, J. B., & Cai, Y. (2007). Emotional and behavioural problems in Singaporean children based on parent, teacher and child reports. *Singapore Medical Journal, 48*, 1100–1106.
- Yang, L. (2007). Application of mental illness stigma theory to Chinese Societies: Synthesis and new direction. *Singapore Medical Journal, 48*, 977–985.
- Yang, L. H., & Kleinman, A. (2008). 'Face' and the embodiment of stigma in China: The cases of schizophrenia and AIDS. *Social Science & Medicine, 67*, 398–408. doi:[10.1016/j.socscimed.2008.03.011](https://doi.org/10.1016/j.socscimed.2008.03.011)