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
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

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

|                         | NHMS 1996 (95% CI) | Rate of increase (%) 1996 to 2006 % (95% CI) | NHMS 2006 (95% CI) | Rate of increase (%) 2006 to 2011 % (95% CI) | NHMS 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)     | +152                                        | 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** |                    |                                             |                    |                                             |                    |
| 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; *quartile 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** |                |           |                     |         |
| 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; *quartile 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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