C Leung 梁　敏
S Leung 梁士莉
R Chan 陳淑薇
K Tso 曹家碧
F Ip 葉麗賢

ORIGINAL ARTICLE

Child behaviour and parenting stress in Hong Kong families

香港家庭的兒童行為及親職壓力

Objectives. To examine parent perception of child behaviour problems and parenting stress in Hong Kong, and to assess the extent to which they are related to socio-demographic factors and the availability of social support.

Design. Cross-sectional survey by using a questionnaire.

Setting. Maternal and Child Health Centres, Hong Kong.

Participants. Parents of children aged 4 years who were registered with Maternal and Child Health Centres and were living in Hong Kong between September 2002 and February 2003.

Main outcome measures. Child behaviour problems and parenting stress.

Results. A total of 1009 questionnaires were returned giving a participation rate of 67.0%. About one tenth of parents were experiencing difficulties with their children's behaviour. Parenting stress and children's behaviour problems were associated with presence or absence of social support. Parenting stress was also associated with household income.

Conclusions. The prevalence of child behaviour problems in Hong Kong is comparable with international figures. Intervention programmes should be targeted at parents who experience difficulties with their children's behaviour and parenting.

目的：探討香港家長面對的兒童行為問題及親職壓力，並評估兩者與個人背景和社會支援的相關程度。

設計：橫斷面問卷調查。

安排：母嬰健康院，香港。

參與者：2002年9月至2003年2月期間於香港居住及在香港母嬰健康院登記其子女均為4歲的父母。

主要結果測量：兒童行為問題及親職壓力。

結果：共收回問卷1009份，參與率為67.0%。約一成家長表示在處理子女行為問題上出現困難。此外，親職壓力及兒童行為問題與社會支援存在與否有關，而親職壓力亦與家庭收入有關。

結論：香港的兒童行為問題的普遍程度與外國數據相近。介入計劃應以難以處理子女行為問題及出現親職壓力的家長為目標。

Family Health Service, Department of Health, Wu Chung House, 213 Queen's Road East, Wanchai, Hong Kong
C Leung, MSc, PhD
S Leung, MB, BS, MPH
R Chan, BSc, PhD
K Tso, MB, BS, MPH
F Ip, BSc, MSocSc

Correspondence to: Dr C Leung
(e-mail: fhssro@dh.gov.hk)

Introduction

Psychosocial problems in adolescents, including drug abuse, delinquency, suicide, and mental disorders, are causing increased concern.[1-4] Many of the problems can be traced back to early childhood behaviour problems.[5-7] Harsh and ineffective parenting, poor parental monitoring, lone parent status, and low socio-economic status are some of the major factors associated with child behaviour problems.[8-10] Ineffective parenting is also related to the level of parenting stress.[11] Parenting stress arises as a result of the interplay between child characteristics and parental characteristics, and situational variables including major life events that may occur in the parents' life, such as redundancy and immigration.

Other factors that have an effect include availability of social support, lone parent status, maternal employment, and socio-economic status.[9,10,12-15]

There are few data on parents' perception of child behaviour problems and associated parenting stress among the general population of families with preschool children in Hong Kong. Previous studies have concentrated on older children,[16,17] or on children with learning or behaviour problems.[18,19] The present study aimed to examine parent perception of child behaviour problems and parenting stress, and related factors, in a general preschool population.

Methods

Survey
The source population were Chinese parents with children registered with Maternal and Child Health Centres (MCHCs) in Hong Kong. These centres provide care for over 90% of all newborns in Hong Kong. All Chinese parents with children aged 4 years (standard deviation, 6 months) who had registered with an MCHC and were living in Hong Kong during the study period (September 2002 to February 2003) were eligible for inclusion. This age-group was chosen because the lowest age limit of validated Chinese versions of questionnaires about child behaviour problems is 4 years. A multi-stage cluster sampling method was used. Hong Kong was divided into four regions and a certain number of MCHCs randomly selected from each region. The number of MCHCs selected and the total number of selected clients in each region were proportional to the population in that region. The MCHC client register was used as the sampling frame, and target participants were randomly selected. In each selected centre, the number of clients selected was proportional to the number of babies born between March 1998 and February 1999 and registered at that centre.

Materials
Eyberg Child Behaviour Inventory
Eyberg Child Behaviour Inventory (ECBI[20]) is a 36-item multi-dimensional measure of parental perception of disruptive behaviour in children (eg non-compliance, temper tantrums). It incorporates two scores: the intensity score and the problem score. The intensity score indicates the frequency of problematic behaviour and the problem score indicates the number of behaviour considered problematic by parents. High scores indicate a high frequency and high number of problematic behaviour. The Chinese version of the ECBI has been validated by the Educa-

tion and Manpower Bureau, Hong Kong Special Administrative Region Government. The validation sample included 461 parents of children aged 4 to 16 years recruited from kindergartens, primary and secondary schools in Hong Kong, and 55 parents of children referred for psychological services because of behaviour problems. The reliability estimates in the validation study for the intensity and problem scales were 0.94 and 0.93, respectively.

Parenting Stress Index: short form
Parenting Stress Index: short form (PSI[10,21])—a 36-item questionnaire—considers three factors: parental distress (PD) measuring an impaired sense of parental competence and depression, parent-child dysfunctional interaction (PCDI) measuring unsatisfactory parent-child interaction, and difficult child (DC) measuring behavioural characteristics of the child. High scores indicate greater difficulties. Only PD and PCDI (12 items in each factor) were measured in this study because there is an overlap between the DC subscale and the ECBI that both measure child problem behaviour. The Chinese version of the PSI was validated using 475 parents of children in a local primary school in a low-income area.[21] The structure of the Chinese version was similar to the original structure. No cut-off point for the Chinese version was reported. The overall reliability was 0.89.[21]

Social support
Participants were asked three questions to indicate the availability of support in three areas: emergency childcare, sharing in times of stress, and financial assistance. The answers were coded as 1 (availability of support) or 0 (no support).

Socio-economic and demographic information
Participants were requested to supply information on sex, age, length of residence in Hong Kong, and educational level of target child; age, length of residence in Hong Kong, educational attainment, and occupation of both parents; household income; family type (eg nuclear, extended, or lone-parent family); marital status; relationship of participant to target child; and social security status.

Ethics approval
This study was approved by the Ethics Committee, Department of Health, Hong Kong Special Administrative Region Government.

Statistical analysis
Questionnaire data were coded and entered into the Statistical Package for the Social Sciences (Windows

Table 1. Comparison of sample characteristics with census data

Characteristic	Present sample		Census data[23]	
	Father	Mother	Male	Female
Educational level				
No schooling/kindergarten	0.6%	1.1%	1.1%	1.5%
Primary	10.3%	8.7%	14.2%	11.6%
Lower secondary	29.0%	24.4%	26.8%	23.0%
Upper secondary	35.2%	47.5%	27.7%	38.1%
Matriculation	3.6%	4.0%	8.1%	9.2%
Tertiary: non-degree course	4.5%	4.6%	4.6%	4.2%
Tertiary: degree course	16.8%	9.7%	17.6%	12.4%
Occupation				
Managerial/administrative	17.8%	13.3%	19.8%	11.0%
Professional	15.7%	13.5%	20.8%	28.8%
Clerical	9.2%	49.3%	5.4%	35.7%
Sales/service	14.9%	20.0%	14.4%	15.9%
Skilled/manual	42.4%	3.9%	39.7%	8.6%
Household income				
<$4000		2.6%		1.5%
$4000-$9999		18.5%		11.9%
$10 000-$19 999		34.6%		30.2%
$20 000-$29 999		16.4%		18.4%
$30 000-$39 999		11.5%		11.7%
≥$40 000		16.4%		26.2%

version 12.0; SPSS Inc, Chicago [IL], United States). Multiple regression analyses were carried out with household income (above and below median domestic household income in Hong Kong), family type (dummy coded into two variables: extended families and lone-parent families), maternal employment, new immigrant status (either parent having resided in Hong Kong for less than 7 years), social support (emergency childcare, sharing in times of stress, financial assistance) to assess their association with child behaviour problems and parenting stress. These variables are known to influence the occurrence of child behaviour problems and parenting stress. All variables were entered at the same time.

Results

The sample
A total of 1505 questionnaires were sent out: 374 target participants were not contactable (letters returned by the post office; follow-up phone contact not possible because phone line was cut; follow-up phone contact indicated that target participant was no longer at that number and address unknown; nobody answered the phone despite repeated attempts). Among the remaining 1131 target participants, 122 refused to participate in the study. A total of 1009 questionnaires were returned giving a participation rate of 67.0% (1009/1505) and a response rate of 89.2% (1009/1131).[22] Among the 1009 questionnaires, 55 had incomplete data and 12 had been completed by participants not normally resident in Hong Kong. These 67 questionnaires were excluded from further analysis. The final analysis included 942 participants.

Comparison of participants with non-participants
The socio-economic and demographic information of the non-participants were compared with a randomly selected group of 120 participants. The information was based on their MCHC records 4 years before. The two groups differed only with regard to father's age (t_{235}=2.98; P=0.003). The mean father's age of the non-participants (36.93 years; 95% confidence interval [CI], 35.45-38.41 years) was older than that of participants (34.15 years; 95% CI, 33.04-35.26 years).

Comparison of participants included in the analysis with those excluded because of incomplete data
There were differences between participants with complete and incomplete data in terms of relationship with target child, χ^2_3=18.59, P<0.001; mother's working status, χ^2_1=4.90, P=0.027; and living status, χ^2_2=6.58, P=0.037. Among those with incomplete data, there was a higher percentage of fathers (23.6%, n=13), working mothers (61.8%, n=34), and parents who lived with their children only during weekends (9.3%, n=5). The corresponding figures for those with complete data were 13.5% (n=127, fathers), 46.5% (n=436, working mothers), and 3.1% (n=29, living with children during weekends). This may have been because parents who were less familiar with

Table 2. Reliability estimates

Questionnaire scale*	Cronbach's Alpha
ECBI-problem	0.91
ECBI-intensity	0.92
PSI-PD	0.85
PSI-PCDI	0.79

* ECBI denotes Eyberg Child Behaviour Inventory; PSI-PD parental distress of the Parenting Stress Index: short form; and PSI-PCDI parent-child dysfunctional interaction of the Parenting Stress Index: short form

their children due to work or living arrangements were less likely to complete the questionnaires.

The study sample

The study sample included parent or caregivers of 506 (54%) boys and 436 (46%) girls. The children's sex ratio was similar to the 2001 census figures.[23] The participants included 808 biological mothers, 127 biological fathers, one foster mother, and six others. Information on household income, parents' educational level and occupation, and the corresponding 2001 census figures based on households with at least one child aged 3 to 4 years are shown in Table 1. Compared with the census data, there were fewer families with income at or above $20 000 per month in the present sample. According to the 2001 census, the median domestic household income was $18 705.00 per month.[23] In this study, there were fewer mothers with a professional occupation but more with a clerical occupation. Among the participants, there were 186 (19.7%) from various countries who had lived in Hong Kong for less than 7 years (new immigrants). Although no exact comparison could be made, in the 2001 census there were 31 797 children aged 5 years or below (8.95% of all children aged 5 years or below[24]) with one or both parents coming from the Mainland China who had resided in Hong Kong for less than 7 years (PMRs). This PMR refers to persons who (i) were born in Mainland China; (ii) were of Chinese nationality with place of domicile in Hong Kong; and (iii) had been resident in Hong Kong for less than 7 years.

Reliability estimates of the questionnaires

The reliability estimates (Cronbach's Alpha) of the questionnaires are shown in Table 2. All were above 0.70.

Prevalence of behaviour problems and parenting stress

Scores for children on the ECBI-intensity scale were normally distributed (Fig 1a). For ECBI-problem scale, the distribution was skewed (Fig 1b). The mean scores of the ECBI-intensity scale and ECBI-problem scale were 117.13 (95% CI, 115.67-118.59) and 7.18 (95% CI, 6.73-7.63), respectively. There was a significant difference in ECBI-intensity for girls and boys (t_{940}=3.99; P<0.001). Parents of boys reported higher scores (mean, 119.87; 95% CI, 117.92-121.82) than parents of girls (mean, 113.95; 95% CI, 111.78-116.13). To judge the need for further evaluation of potentially significant psychopathology, a clinical cut-off point of 131 on the ECBI-intensity scale was recommended by Eyberg and Pincus.[20] A clinical cut-off point of 15 on the ECBI-problem scale indicated that parents were significantly troubled by the child's behaviour.[20] In the Hong Kong validation of the ECBI, the mean ECBI-intensity score and ECBI-problem score of a referral case group (children referred for psychological services because of behaviour problems) were 129.15 and 12.38, respectively, and they were reasonably consistent with the original cut-off scores of the English version. Using the original English version standard, 99 (10.5%) children could be classified as being above the cut-off point (at or above cut-off point for both ECBI-intensity and problem scores). There were 265 (28.1%) children at or above the clinical cut-off point for ECBI-intensity, and 143 (15.2%) at or above the clinical cut-off point for ECBI-problem. Using the Hong Kong figures (at or above 129.15 and 12.38 for ECBI-intensity and ECBI-problem scores, respectively), there were 282 (29.9%) children above the cut-off point for ECBI-intensity and 195 (20.7%) children above the cut-off point for ECBI-problem. There were 129 (13.7%) children above the cut-off point for both ECBI-intensity and ECBI-problem scores.

Parenting stress was measured using the PSI-PD and PSI-PCDI scales. Scores on the PSI-PD and PSI-PCDI were normally distributed (Fig 2). The mean scores for the PSI-PD and PSI-PCDI scales were 34.05 (95% CI, 33.56-34.55) and 27.17 (95% CI, 26.81-27.54), respectively. In the validation of the Chinese version of PSI, the mean PSI-PD and PSI-PCDI scores of the validation sample (a low-income group) were 34.11 and 32.39, respectively.[21] In the Education and Manpower Bureau study, the respective mean scores were 31.86 and 28.85.

Scores above the 90th percentile (PSI-PD: 36; PSI-PCDI: 27) indicate a clinically significant level of stress.[11] Scores within the 15th to 80th percentile are considered within the normal range. However, the Abidin norms are based on a non-random western sample and appropriateness for the Chinese community needs further investigation. In the present sample,
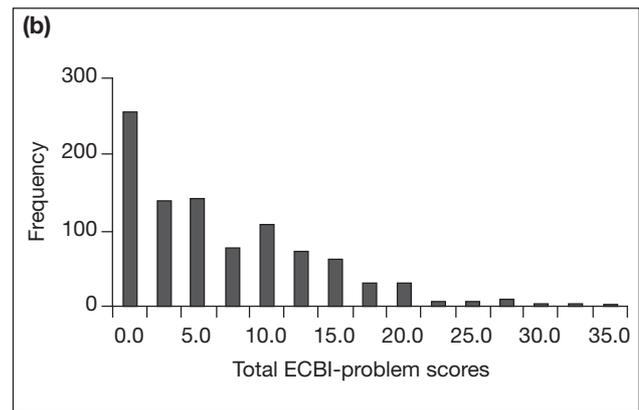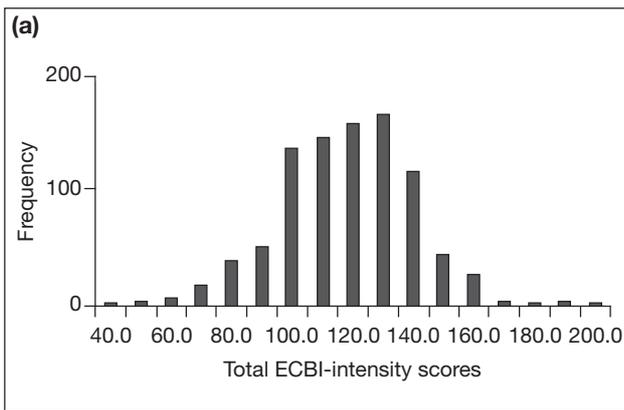
* ECBI denotes Eyberg Child Behaviour Inventory

Fig 1. Distribution of (a) ECBI-intensity scores and (b) ECBI-problem scores*
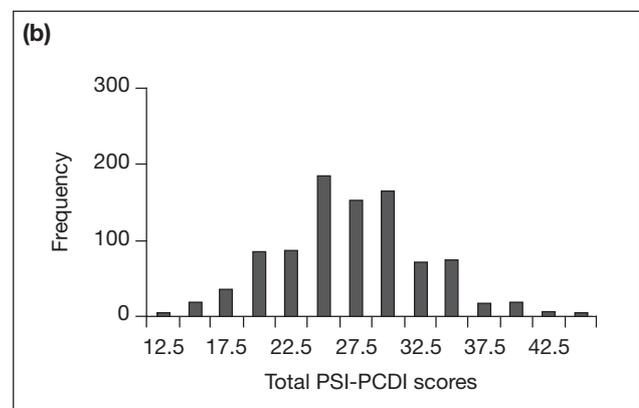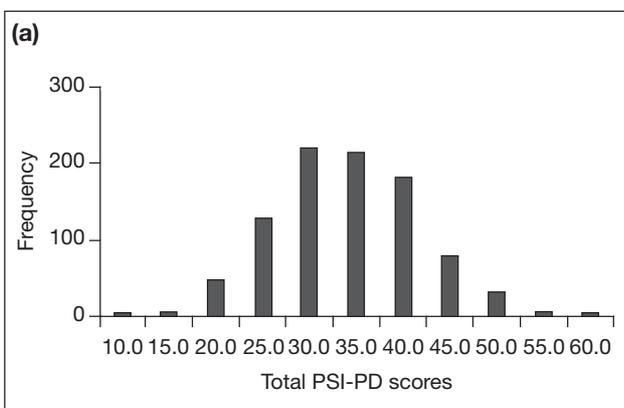
* PSI denotes Parenting Stress Index, PD parental distress, and PCDI parent-child dysfunctional interaction

Fig 2. Distribution of (a) PSI-PD scores and (b) PSI-PCDI scores*

the PSI-PD and PSI-PCDI scores corresponding to the 90th percentile were 43 and 34, respectively.

Variables associated with child behaviour problems
To examine the variables associated with child behaviour problems, two multiple regression analyses were performed. The dependent variables were ECBI-intensity and ECBI-problem scores. The independent variables were availability of social support, maternal employment, family type, new immigrant status, and household income. Household income was used as a measure of socio-economic status. Household income may also reflect parent educational attainment and parent occupation status.

The results of the multiple regression analysis showed that social support (sharing in times of stress) [P=0.001] was associated with ECBI-intensity, adjusted for maternal employment, family type, new immigrant status, household income, and other forms

of social support. Families with someone to share stress reported lower ECBI-intensity scores (mean, 115.90; 95% CI, 114.32-117.48) than those without support (mean, 123.33; 95% CI, 119.66-126.99). The regression results are shown in Table 3.

As ECBI-problem is positively skewed, square root transformation was performed. Social support (sharing in times of stress) [P=0.002] was associated with ECBI-problem, adjusted for other forms of social support, household income, maternal employment, family type, and new immigrant status. Families with someone to share stress reported lower ECBI-problem scores (mean, 6.80; 95% CI, 6.32-7.28) than those without support (mean, 9.05; 95% CI, 7.87-10.23). The regression results are shown in Table 3.

Variables associated with parenting stress
Two multiple regression analyses were performed.

Table 3. Regression results for Eyberg Child Behaviour Inventory (ECBI)–intensity and ECBI-problem scores

Result	B	β	95% confidence interval for B		t	r	sr^2
			Lower bound	Upper bound			
ECBI-intensity: $F_{8,919}$=3.26, P=0.001, adjusted R^2=0.02							
Social support (childcare)	0.66	0.01	-4.44	5.76	0.26	-0.03	0.0001
Social support (sharing)	-7.49	-0.12	-11.73	-3.25	-3.47*	-0.13	0.0128
Social support (financial assistance)	-2.74	-0.05	-6.78	1.30	-1.33	-0.07	0.0018
Household income	-1.95	0.04	-5.44	1.53	-1.10	-0.05	0.0013
New immigrant	-3.54	-0.06	-7.55	0.47	-1.73	-0.06	0.0031
Maternal employment	1.05	0.02	-2.29	4.39	0.62	0.05	0.0004
Lone parent	-4.00	-0.02	-16.59	8.59	-0.62	-0.02	0.0004
Extended family	2.39	0.05	-1.01	5.79	1.38	0.03	0.0020
ECBI-problem (square root transformation): $F_{8,919}$=3.13, P=0.002, adjusted R^2=0.02							
Social support (childcare)	-0.06	-0.01	-0.39	0.27	-0.38	-0.06	0.0001
Social support (sharing)	-0.44	-0.11	-0.71	-0.16	-3.14†	-0.13	0.0104
Social support (financial assistance)	-0.11	-0.03	-0.37	0.195	-0.82	-0.08	0.0007
Household income	0.03	0.01	-0.19	0.25	0.26	0.05	0.0001
New immigrant	0.22	0.06	-0.04	0.47	1.66	0.08	0.0029
Maternal employment	-0.01	0.00	-0.21	0.22	0.09	-0.03	0.0000
Lone parent	-0.29	-0.02	-1.10	0.51	1.42	-0.03	0.0005
Extended family	0.16	0.05	-0.06	0.38	1.42	0.06	0.0021

* P≤0.001
† P<0.01

Table 4. Regression results for parental distress scores of the Parenting Stress Index: short form (PSI-PD) and parent-child dysfunctional interaction scores of the Parenting Stress Index: short form (PSI-PCDI)

Result	B	β	95% confidence interval for B		t	r	sr^2
			Lower bound	Upper bound			
PSI-PD: $F_{8,919}$=13.73, P<0.001, adjusted R^2=0.10							
Social support (childcare)	-1.24	-0.05	-2.89	0.41	-1.48	-0.16	0.0021
Social support (sharing)	-4.15	-0.20	-5.52	-2.78	-5.95*	-0.27	0.0342
Social support (financial assistance)	-1.74	-0.09	-3.04	-0.43	-2.61†	-0.21	0.0066
Household income	1.25	0.08	0.12	2.38	2.18‡	0.16	0.0046
New immigrant	-0.06	-0.00	-1.36	1.24	-0.09	0.08	0.0000
Maternal employment	-0.99	-0.06	-2.07	0.09	-1.80	-0.13	0.0031
Lone parent	3.85	0.06	-0.23	7.92	1.85	0.07	0.0034
Extended family	0.13	0.01	-0.97	1.23	0.23	0.00	0.0001
PSI-PCDI: $F_{8,919}$=12.70, P<0.001, adjusted R^2=0.09							
Social support (childcare)	-0.90	-0.05	-2.11	0.32	-1.45	-0.14	0.0020
Social support (sharing)	-2.14	-0.14	-3.15	-1.13	-4.16*	-0.21	0.0169
Social support (financial assistance)	-0.88	-0.06	-1.84	0.09	-1.79	-0.17	0.0031
Household income	1.96	0.17	1.13	2.79	4.64*	0.24	0.0210
New immigrant	0.66	0.05	-0.30	1.61	1.35	0.14	0.0018
Maternal employment	-0.18	-0.02	-0.98	0.61	-0.45	-0.13	0.0002
Lone parent	0.26	0.01	-2.74	3.26	0.17	0.02	0.0000
Extended family	0.53	0.04	-0.28	1.34	1.29	0.06	0.0016

* P≤0.001
† P<0.01
‡ P<0.05

The dependent variables were PSI-PD and PSI-PCDI scores. The independent variables were the same as those used for child behaviour problems.

Social support (sharing in times of stress) [P<0.001], social support (financial assistance) [P=0.009], and household income (P=0.03) were associated with PSI-PD, after adjusting for family type, maternal employment status, new immigrant status, and social support (childcare assistance). Families with social support (sharing in times of stress) reported lower PSI-PD scores (mean, 33.10; 95% CI, 32.57-33.63) than those without support (mean, 38.60; 95% CI, 37.53-39.67). Families with access

to financial assistance reported lower PSI-PD scores (mean, 33.17; 95% CI, 32.62-33.72) than those without (mean, 37.30; 95% CI, 36.32-38.28). Families whose household income was below the median domestic household income reported higher PSI-PD scores (mean, 35.20; 95% CI, 34.56-35.83) than families with household income above the median domestic household income (mean, 32.61; 95% CI, 31.85-33.36). The regression results are shown in Table 4.

Household income (P<0.001) and social support (sharing in times of stress) [P<0.001] were associated with PSI-PCDI, adjusted for other forms of social support, family type, new immigrant status, and maternal employment. Families with social support (sharing in times of stress) reported lower PSI-PCDI scores (mean, 26.64; 95% CI, 26.26-27.03) than families without (mean, 29.98; 95% CI, 28.86-30.70). Families with a household income below the median domestic household income reported higher PSI-PCDI scores (mean, 28.38; 95% CI, 27.91-28.84) than families with income above the median domestic household income (mean, 25.69; 95% CI, 25.15-26.24). The regression results are shown in Table 4.

Discussion

Using the original Eyberg and Pincus[20] cut-off point and the Hong Kong Education and Manpower Bureau findings, the results of this study indicate that in a Chinese community, approximately 10% to 13% of 4-year-old children display behaviour that should be further evaluated for diagnosis of potentially significant psychopathology. Parents are extremely concerned about the children's behaviour problems. The present findings are comparable with most other research on child behaviour problems where the consensus is that roughly 10% to 15% of preschool children have behaviour problems.[25]

Parental perception of child behaviour problems was associated with the availability of social support (sharing in times of stress). However, the results did not show an association between parent-perceived child behaviour problems and household income as reported in the literature.[8]

Parenting stress was related to household income and the availability of social support (sharing in times of stress and financial assistance). The results are consistent with others' findings of a negative relationship between social support and parenting stress,[12] and differences in parenting stress by parent socio-economic status.[13] The results indicated that a group of low-income families and families without social support were experiencing considerable parenting stress.

This study highlights the association between the availability of social support and parenting stress as well as parent-perceived child behaviour problems. In the regression analyses of child behaviour problems and parenting stress, social support, in particular having someone to share in times of stress, remains associated with child behaviour problems and parenting stress, after controlling for other forms of social support, household income, maternal employment status, new immigrant status, and family type.

In terms of service implications, research has shown that parent training can reduce child behaviour problems and maternal anxiety and stress.[26] Such parent training programmes could be made available to parents who are experiencing problems with their children's behaviour, and parents with high parenting stress. Frontline service providers should be alert to the needs of parents who have difficulty managing their children, high parenting stress, or little social support and help them access to appropriate services.

Limitations of the study

First, there was some concern about the representativeness of the study sample. Although the MCHC client register was considered the best available sampling frame because it covered approximately 90% of newborns, the 10% of parents not using the service could not be studied. The relatively low participation rate of 67.0% was due to a high proportion (25% of eligible parents) of uncontactable parents. While we were unable to obtain sufficient information to compare the contactable and uncontactable groups of parents, there was no reason to suggest any systematic differences between the two. Among parents contacted, the response rate was appreciable (89.2%). It is important to note that high-income parents and mothers in a professional occupation were under-represented compared with census figures.

Second, the lack of an established local norm with regard to the cut-off scores of the parenting stress questionnaire meant that no firm conclusions could be drawn about the prevalence of parenting stress in Hong Kong. Nonetheless, the information collected can help understand the relationship between social support, parenting stress, and child behaviour problems. This can also be used for future comparisons.

Third, being a cross-sectional survey, it could not determine the causal relationship between child behaviour problems, parenting stress, and social support.

Conclusions

The present study is the first large-scale community survey of parents of 4-year-old children in Hong Kong, with reasonable representativeness. The study indicates that the prevalence of parent-perceived child behaviour problems is about 10%. Social support is associated with parent-perceived child behaviour problems and parenting stress. Low household income is also associated with parenting stress. Parents with perceived child behaviour problems and parenting stress, especially those with low social support and household income, may benefit from parent training and support programmes.

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