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Research Article

The Relationship Between Parenting Style, Child Behaviour and Socioeconomic Status: A Mediation Analysis

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Abstract

Objective: Parenting styles and Family Socioeconomic Status **(SES)** are associated with child behaviour problems, but less is known about the mediating role of parenting styles. The aim of the study is to examine the relationship between parenting styles, socioeconomic status **(SES),** and child behaviour in Hong Kong. **Participants and Method:** Hong Kong parents (n=1,393) with primary school-aged children were evaluated for their sociodemographic parenting styles (Parenting Styles and Dimensions Questionnaire, **PSDQ**), with child behaviour assessed by (Strengths and Difficulties Questionnaire, **SDQ**). A mediation model examined the indirect effect of SES on child behaviour through different parenting styles. **Results:** While SES factors inherently affected child behaviour, with lower income and education levels correlated with more behavioural problems in children. Parenting styles mediated the relationship between parental income and parental education level in child difficulties. Authoritative parenting style might mitigate the adverse effects of lower SES on child behaviour, **Conclusion:** This study suggests the mediating role of effective parenting styles could be important amenable abilities in enhancing child behaviour despite the limitations of education and income in some families. Developing parental educational programs that focus on training parents in authoritative parenting techniques, which balances warmth and autonomy-granting with reasonable control, may strengthen favourable child behaviour regardless of socioeconomic circumstances.

Keywords: Parenting style; Socioeconomic status; Authoritative parenting; Permissive parenting; Authoritarian parenting

Introduction

Childhood represents a phase of significant growth, especially between the ages of 6 and 12, which marks a crucial transition toward increasing independence, as well as enhanced social and cognitive skills [1]. During this formative stage, children must learn to navigate new settings and modify their behaviours accordingly. Additionally, it is a time when children begin to move beyond earlier behavioural issues. Previous research has focused on identifying behavioural challenges (both internalizing and externalizing behaviours) during these early years and their impact on future development [2,3]. Increasing evidence suggests that early and continuous behavioural issues are linked to negative long-term outcomes, including poor academic performance [4] and problematic conduct in adolescence [5].

A wide array of genetic, biological, and developmental environmental factors e.g., maternal mental health, child personal factors, adoption of parenting styles and socioeconomic status **(SES)** are closely related to the development of child behaviour [6,7]. For instance, parents' mental health significantly impacts child development, with maternal depression associated with a range of developmental and behavioural issues in children [8]. Child personal factors including gender, and age could also affect child behaviour [9]. Furthermore, the adoption of specific parenting styles and SES have been shown to be associated with child developmental outcomes in both cross-sectional [10-12] and longitudinal studies [13].

Parenting styles, as defined by Baumrind [14] and further expanded by Maccoby and Martin [15], encompass "a constellation of attitudes toward the child that are communicated to the child and create an emotional climate in which the parent's behaviours are expressed" [11]. These behaviours include various aspects of the parent-child interaction that transmit emotional attitudes but are not necessarily focused on achieving specific goals. Such aspects include the tone of voice, body language, lack of attention, and spontaneous outbursts of anger [16]. Parenting styles encompass authoritarian, permissive, and authoritative styles, which are characterized by varying levels of warmth/support, demands/control, and psychological pressure and influence child development and parental stress [14,15,17]. The effect of parenting style has been widely documented as having an association with child behaviour problems, especially for children aged between 6-12 [18]. While authoritarian and permissive parenting is associated with behavioural problems in children [19], and higher stress, depression, and irritability [20]; authoritative parenting, which balances high responsiveness and high demand, is associated with more favourable child outcomes [16,21]. Within the Chinese cultural context, parenting styles are influenced by traditional Confucian values emphasizing filial piety and parental authority as well as more modern Western ideologies promoting autonomy and independence [22,23]. Chinese parents in Hong Kong must navigate co-existing Chinese and Western cultural influences, and their parenting styles tend to reflect an integration of these traditions.

Families of lower SES, specifically lower parental education and household income, typically have fewer resources to invest in their children and experience more strain, which can undermine parenting quality and child adjustment [24]. Constrained levels of education can undermine health literacy and resilience, exacting, and encumbering child-rearing. Though studied in Western populations, the mediating role of parenting styles in the relationship between SES factors and child outcomes is less understood in Chinese families [25]. While socioeconomic circumstances may be challenging to change, parenting styles are potentially adaptable, but little is known about the buffering effect of parenting styles on these SES factors and child behaviour.

Hong Kong provides a unique cultural context to explore these issues, as traditional Chinese values shape parenting ideals but Western influences are also prominent. Filial piety emphasizes authoritarian parenting styles focused on strict control, while contemporary progressive values promote more autonomy-granting approaches [26]. This cultural shift may exacerbate tensions between generations regarding appropriate childrearing practices. At the same time, income inequality in Hong Kong has increased, subjecting more families to socioeconomic disadvantage. From 2001 to 2011, Hong Kong had significantly more divergence in monthly household income distribution. While the median household income of the 4th – 10th decile groups increased by 8%-20%, there was a decrease of 3% – 25% for the first two decile groups [27]. Although extensive research has examined these relationships in Western populations, less is known about the situation in Chinese families undergoing socioeconomic disparity and cultural changes.

Given this backdrop, the current study aims to delve deeper into how parenting styles and SES factors collectively affect child behaviour within a sample of Hong Kong Chinese parents and children aged 6-12. Examining the mediating role of parenting styles in the context of socioeconomic challenges might shed light into tailoring potential interventions that could mitigate the adverse effects of socioeconomic challenges on child development.

Methods

Data

The analysis was based on data drawn from the baseline assessment of a Parent Education Mental Health Program **(PEMH)** in six local primary schools in July 2021. All participants of PEMH were invited to complete the examination survey on a voluntary basis. The final response consisted of 1,393 parents of primary school-age children (aged 6-12). Parents from the dedicated local primary schools were recruited for the evaluation study. Parents were recruited for the study in July 2020. This study was approved by the Institutional Review Board of The University of Hong Kong/Hospital Authority, Hong Kong West Cluster **(HKU/HA HKW IRB**) (reference no.: UW 20-472). All participating parents completed the baseline and follow-up self-rated questionnaires in traditional Chinese via the Qualtrics Survey platform (https://www.qualtrics.com), with the completion of questionnaires as part of the regular service delivery practice. Hard copies of questionnaires were provided for those participants who were not familiar with digital tools. The newly developed Parent Education in Mental Health **(PEMH)** intervention aims to provide a comprehensive,

multi-level approach to parenting education. PEMH aims to equip parents with the knowledge and skills necessary to identify and address their children's mental health concerns, enhance relationships, and effectively manage their stress. Grounded in evidence-based theories including developmental psychology [28], positive parenting [29], mindful parenting [30], and parental resilience research [31], this program is led by registered social workers who have undergone four sessions of professional training in parents' education by child psychiatrists.

Sociodemographic Questionnaire

The parents' basic demographics, including age, gender, years of education, place of birth, religion, marital status, number of children, occupation, household income, and mental health were collected. In addition, their children's mental health, class and academic performance were collected.

Parenting Styles

Parenting styles were assessed by the Parenting Styles and Dimensions Questionnaire **(PSDQ)** [32]. It contained 32 items to assess the extent of three parenting styles, namely authoritative, authoritarian, and permissive parenting styles. There were seven sub-categories: permissive; physical coercion; non-reasoning/ punitive; verbal hostility; warmth and support; autonomy granting; and regulation). Each item is scored on a 5-point Likert scale anchored from 1 (never) to 5 (always). A higher score indicated a broader use of the corresponding parenting practices. The Chinese version of the PSDQ is a valid and reliable measure to assess parenting styles in the Chinese population. Additionally, parents' basic demographics, including gender, age, marital status, number of children, education level, housing, living status, number of persons living together, occupation status, monthly household income, sufficient income for daily needs, family history and personal history on mental disorders; as well as their children's gender, age, and mental health were evaluated as determinants of parenting styles.

Child Behaviour

Parental stress was examined by rating sentences representing positive parenthood themes and negative components through the Parental Stress Scale **(PSS-18)** [22]. The PSS-18 consisted of 18 items, with the response options for each item ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater parental stress. The Chinese version of PSS-18 was demonstrated to be a reliable and valid tool for measuring parental stress in the Chinese population in Hong Kong [33,34]. Parental efficacy assessed the level of confidence of parents in confronting their children, by using the General Self-Efficacy Scale [35]. The GSE consists of 10 items. Each item is answered on a 4-point Likert scale ranging from 1 (not at all true) to 4 (exactly true), with higher scores indicating greater self-efficacy. The Chinese version of the GSE showed satisfactory reliability and consistency in the Chinese population [36]. The Chinese version of Strengths and Difficulties Questionnaires **(SDQ)** was used to identify potential positive or negative psychological attributes demonstrated by children [37]. Parents were required to identify if the listed items applied to their children by answering "not true", "somewhat true", and "certainly true". It consists of 25 items, which could be sub-categorized into 5 classes: emotional symptoms, peer relationship problem, conduct problem, hyperactivity/inattention, and prosocial behaviour; The overall difficulty scores were calculated by summarising the item scores of the first four classes excluding prosocial behaviour. The Chinese version of SDQ demonstrated a reliable and valid instrument for measuring child behaviour in the Chinese population [38].

Data Analysis

All analyses were performed using IBM SPSS Statistics (version 29) software. Missing data for the outcome measures were handled by multiple imputations [29]. Descriptive statistics summarised participants' sociodemographic characteristics, children's difficulties, parental stress and general self-efficacy. A multiple regression analysis was conducted to investigate the associated variables and parents' perceptions of their children's total difficulties (SDQ scores). The significant variables in the univariate models are inputted into the multivariate logistic regression model. The identified SES variables were selected as independent variables of the mediation model. Mediation analyses using bootstrapping tested indirect effects of SES variables and child behaviour through parenting styles. Two-tailed tests with a significance level set at 0.05 were used for all analyses.

Results

Participants Characteristics

The sociodemographic characteristics of the participants were summarized in Table 1.

	Overall (*n* = 1393)	
	n	**%**
Gender		
Male	216	15.6
Female	1169	84.4
Age		
18-30	37	2.8
31-40	638	48.5
41-50	572	43.4
51 or above	70	5.3
Marital status		
Married/ In relationship	1226	92.2
Divorced/ Separated/ Widowed	104	7.8
Number of children		
1	481	38.4
2	648	51.7
3	110	8.8
4 or more	14	1.1
Education level		
Elementary or below	67	4.9
High School/ College	852	61.9
University or higher	457	33.2
Housing		
Private	616	46.4
Home Ownership Scheme	121	9.1
Public	392	29.5
Others	198	14.9
Living status		
Living with Partner	623	47.1
Living with family	619	46.8
Living alone/ Others	81	6.1
Number of persons living together		
2 persons	37	3
3 persons	304	24.5
4 persons	481	38.7
5 persons or more	419	33.8
Occupation status		
Full-time	485	36.5
Part-time	113	8.5
Homemaker/ Unemployed/ Retired	731	55
Monthly household income (HK$)		
<20000	476	37.4

20000 – 59999	463	36.4
≥ 60000	334	26.2
Sufficient income for daily needs		
Yes	909	70.5
No	381	29.5
Family history on mental disorders		
Yes	46	3.6
No	1247	96.4
Personal history on mental disorders		
Yes	70	5.4
No	1232	94.6
Child's gender		
Male	645	51.5
Female	608	48.5
Child's age		
5 or below	28	2.3
6 – 8	717	59.6
9 – 11	422	35
12 or above	37	3.1
Child's history on mental disorders		
Yes	25	2
No	1235	98
Note. *n* = total number of participants. Only valid responses were included		

Table 1: Sociodemographic Characteristics.

The sample consisted of 1,393 parents (84.4% female) with a mean age of 39.90 years (SD = 8.01). The majority were married or in a relationship (92.2%). 61.9% of parents completed high school or above, and 33.2% of parents received a university education or above. Over a third (37.4%) of the participants had a monthly household income below HK$20,000. Another 36.4% earned between HK$20,000 to HK$59,999. The remaining 26.2% had a monthly household income of HK$60,000 or above. 70.5% of participants reported having adequate financial resources to meet daily needs, whereas 29.5% expressed inadequacy in their daily expenses. Parents mostly engaged in authoritative parenting style (mean = 3.86; SD = 0.51), followed by permissive parenting style (mean = 2.58; SD = 0.56), and authoritarian parenting style (mean=2.24; SD=0.54). The level of child behaviour and parental stress scores was detailed in Table 2.

	Baseline	
	M	**SD**
Parental Stress Scale (PSS-18)	52.14	3.47
General Self-Efficacy Scale (GSE-10)	23.38	5.14
Parenting Styles and Dimensions Questionnaire (PSDQ)		
Permissive	2.58	0.56
Authoritarian	2.24	0.54
Physical coercion	1.9	0.63

Non-reasoning/ Punitive	2.05	0.63
Verbal hostility	2.77	0.67
Authoritative	3.86	0.51
Warmth and support	4.01	0.57
Autonomy granting	3.71	0.57
Regulation	3.85	0.59
Strengths & Difficulties Questionnaires (SDQ)		
Emotional symptoms	2.77	2.01
Peer relationship problems	2.69	1.69
Conduct problems	2.34	1.44
Hyperactivity/ inattention	4.56	2.32
Prosocial behaviour	6.72	1.89
Total difficulties	12.37	5.26
Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. M = mean; SD = standard deviation.		

Table 2: Description of the assessment scores (n=1,393).

The Mediating Role of Parenting Style in Child Behaviour

As shown in Table 3, there was a significant negative association between education level with SDQ scores (B = -0.55, p < 0.001), indicating that higher educational levels of parents were linked to fewer behavioural difficulties in children. Lower income and perceptions of income insufficiency were correlated with more difficulties in child behaviour. The child's factors, including being male, and younger age, along with any developmental problems were also correlated with behavioural difficulties in children.

	SDQ		
Variable	B (95% CI)	b	p
Initial Model			
Constant	13.17***		
Parent's Sex	-0.25 (-1.18, 0.68)	-0.02	0.596
Parent's Age	0.01 (-0.03, 0.05)	0.01	0.66
Education Status	-0.52 (-0.84, -0.20)	-0.11	0.002**
Marital Status	0.26 (-1.05, 1.57)	0.01	0.695
No. of Children	-0.11 (-0.68, 0.46)	-0.01	0.695
Housing (Private Estate)	0.35 (-0.38, 1.09)	0.03	0.349
Living with Partners	0.10 (-0.56, 0.77)	0.01	0.76
Persons Living Together	0.15 (-0.20, 0.50)	0.03	0.399
Working Status	-0.69 (-1.41, 0.02)	-0.06	0.058
Household Income	-0.11 (-0.23, 0.01)	-0.07	0.066
Income enough for living?	-1.11 (-1.90, -0.31)	-0.09	0.007**
Personal History of Mental Disorders	1.56 (0.02, 3.09)	0.06	0.047*
Child's Sex	-1.74 (-2.38, -1.10)	-0.16	<0.001***
Child's Age	-0.10 (-0.20, -0.01)	-0.06	0.037*

Child Having Developmental Problems	5.93 (3.55, 8.32)	0.15	<0.001***
Final Model			
Constant	14.79***		
Education Status	-0.55 (-0.86, -0.24)	-0.12	<0.001***
Working Status	-0.79 (-1.46, -0.12)	-0.07	0.020*
Household Income	-0.11 (-0.23, 0.00)	-0.07	0.056
Income enough for living?	-1.16 (-1.93, -0.40)	-0.09	0.003**
Personal History of Mental Disorders	1.47 (-0.04, 2.99)	0.06	0.057
Child's Sex	-1.75 (-2.38, -1.11)	-0.16	<0.001***
Child's Age	-0.10 (-0.20, -0.01)	-0.06	0.032*
Child Having Developmental Problems	5.95 (3.59, 8.32)	0.15	<0.001***
Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.			

Table 3: The Association Between Sociodemographic Variables and Child Difficulties.

Income and education were selected as independent variables for the mediation models, investigating the role of parenting styles as mediators on child behaviour (Table 4). For the variable of educational level, the indirect effect (path "ab") on child difficulties demonstrated a negative correlation through both permissive (ab= -0.1160, p < 0.001) and authoritarian (ab=-0.0950, p < 0.001) parenting styles, indicating simply having a higher education did not necessarily lead to better childhood outcome, unless it is paired with effective parenting practice. Authoritative parenting mediated the relationship between educational level and child difficulties (ab=-0.2571, p < 0.001), suggesting that an authoritative parenting style may be particularly effective in mitigating child behavioural problems associated with lower educational levels. Regarding monthly household income, the indirect effects on children's difficulties varied across parenting styles. Permissive parenting exhibited a minor positive correlation (ab= 0.0166, p < 0.001), while authoritarian parenting showed a small negative relationship (ab= -0.0249, p <0.001). Authoritative parenting demonstrated a more significant negative effect on child behaviour problems (ab=-0.0955, p < 0.001), suggesting authoritative parenting may leverage the positive effect of parental income, and promote favourable child behaviour. These effects are visualised in Figure 1.

Parenting Style	Demographics	Outcome Variable	Total Effect. Value	Indirect Effect Value (IE)	p-value	Boot SE	Coefficient of Path c	Coefficient of Path a	Coefficient of Path b
Permissive	Educational Level	Children Difficulties	-0.6821	-0.116	<0.001	0.022	-0.68	-0.028	4.22
				(-0.1594 - -0.0706)			(-0.77- -0.59)	(-0.037- -0.018)	(4.02-4.41)
Authoritarian		Children Difficulties	-0.7031	-0.095	<0.001	0.023	-0.7	-0.02	4.61
				(-0.1408- -0.0490)			(-0.79- -0.61)	(-0.030- -0.011)	(4.41-4.81)
Authoritative		Children Difficulties	-0.541	-0.2571	<0.001	0.0179	-0.54	0.077	-3.36
				(-0.29- -0.22)			(-0.64- -0.44)	(0.068- 0.086)	(-3.59- -3.13)

Permissive	Monthly household income	Children Difficulties	-0.2711	0.0166	<0.001	0.0083	-0.2711	0.0037	4.4716
				(0.0008-0.0331)			(-0.3042)	(0.0001-0.0073)	(4.266-4.678)
Authoritarian		Children Difficulties	-0.23	-0.0249	<0.001	0.009	-0.2296	-0.0052	4.7885
				(-0.0428--0.0072)			(-0.26-0.19)	(-0.0087--0.0017)	(4.58-5.00)
Authoritative		Children Difficulties	-0.16	-0.0955	<0.001	0.007	-0.16	0.03	-3.54
				(-0.1088--0.0824)			(-0.19--0.12)	(0.02-0.03)	(-3.77--3.30)

Table 4: Table on the Mediation Analysis of Parenting Styles and Educational Level/ Monthly Household Income on Child Difficulties.

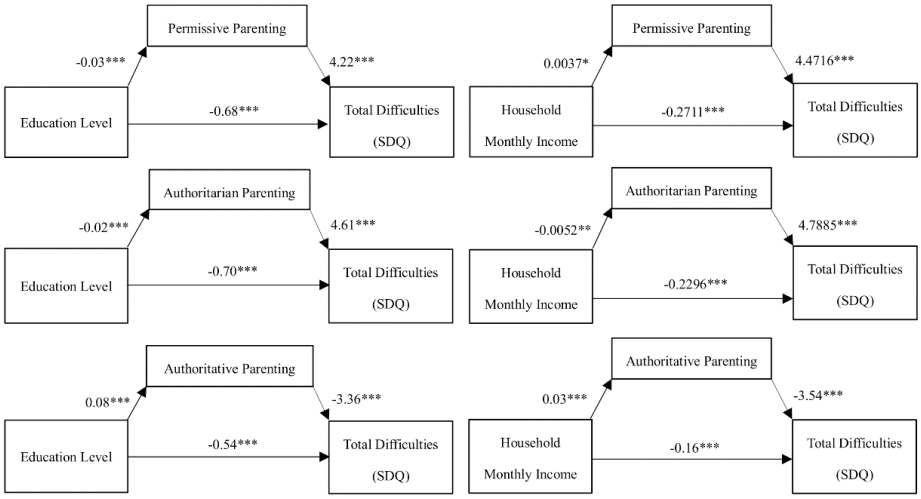

Figure 1: Mediation effects of Parenting Styles for the association between education level/ parenting style and child behavior.

Discussions

The present study examined the relationships between parenting styles, socioeconomic status, and child difficulties from 1,393 parents in Hong Kong. While SES factors inherently affect child behaviour, with lower income and education level correlated with more behavioural problems in children, parenting styles mediated the relationship between income and education level in child difficulties. Authoritative parenting style may mitigate the adverse effects of lower SES on child behaviour, suggesting training parents in effective parenting styles, particularly authoritative parenting, could be important amenable abilities in enhancing child behaviour despite the limitations of education and income in some families.

In our study, the predominance of female participants (84.4%) and a high percentage of those in committed relationships (92.2%) reflect that in Hong Kong parents, mostly mothers, were more engaged in active parenting roles. Child personal factors were correlated with more difficult child behaviour. Male and younger children might exhibit more behavioural problems, as boys can have higher activity levels and externalizing behaviour problems in the Caucasian population [39,40], and also in the Asian population [9]. Children with developmental disorders significantly contribute to behavioural difficulties. For instance, children diagnosed with autism spectrum disorder often reported a high prevalence of issues such as poor sleep quality, and difficulties with toileting and eating, and were frequently associated with increased anxiety and tantrums [41]. Similarly, developmental disorders in sensory processing had a unique contribution to behavioural problems in children, presenting challenges in managing day-to-day activities [42]. Additionally, Attention and Deficit Hyperactivity Disorder is related to developing conduct problems due to impulsivity and dysregulated executive functions [43]. Nevertheless, addressing these child-specific factors often necessitates interventions at the level of mental health services, which may not always be feasible due to resource constraints. This underscores the need to examine how broader socioeconomic influences, such as parental education and income levels, affect child behaviour, taking into account their mediating factors.

Lower parental educational attainment might limit health literacy and coping abilities, making parental adjustment more taxing [12,24,44], but it could be mediated through parenteral family processes, including parents' parenting practices [45]. It is controversial regarding the effect of financial income on child behaviour. While economic hardship might limit the resources, experience, and support offered by family, children from families with lower economic status might demonstrate more behavioural problems than their counterparts from families with higher economic status [46,47]. However, other researchers have reported inconsistent results. It was found there was an absent difference between UK children from families with different family incomes, after controlling for other variables [48]. A local study also found little difference in HK child behaviour from families with different family incomes [44]. It was instead identified that parenting practices could be key mediating factors in child behaviour [48]. Our study showed that the effects of parental education and household income on child behaviour were partially mediated by parenting practices. Authoritative parenting might enhance adaptive coping, providing a structured yet supporting environment that fosters child development [24,49]. Its balance of warmth, sensitivity, and reasonable control [14] might foster child competencies and lower parental demands. While permissive and authoritarian styles also mediated the relationship between SES factors and child behaviour, they exponentiated rather than mitigated the child behaviour, suggesting that simply having a higher education and better income did not necessarily lead to optimal outcomes unless it is paired with effective parenting styles. This suggests that while permissive parenting may provide a supportive environment, its lack of structure might not adequately prepare children to face societal challenges. Similarly, the strict nature of authoritarian parenting might inhibit the development of autonomy and social skills in children [51].

Practical Implications

Our results indicate the need for enhancing parenting styles as an essential component of parenting problems in enhancing child behaviour. Educational programs targeting parents should not only focus on providing knowledge and resources but also on training parents in effective parenting styles, particularly authoritative parenting [52]. Policies aimed at reducing educational and economic disparities could be complemented by support for parenting programs that encourage effective parenting practices. These findings advocate for a holistic approach to child welfare programs that integrate economic support with educational and behavioural interventions at the family level. Enhancing parenting abilities could be as important as socioeconomic improvements in enhancing child behaviours.

Limitations

Our study uses validated self-report questionnaires that have been adapted for use in Chinese parents, within a predominantly middle-class Chinese population. Notwithstanding the strengths, our study has several limitations. First, the cross-sectional design of the study limits causality inference. Longitudinal research is needed to better understand the temporal relationships between these variables. Second, data from both parent's and children's educational outcomes were unavailable, making it unable to make within-family comparisons and objective measures of children's behaviours. Third, the study's reliance on self-reported data may introduce bias. Future research could incorporate observational methods or teacher reports to obtain a more objective measure of child behaviour and parental practices.

Suggestions for Future Research

Longitudinal research (e.g. (50,53) is needed to establish causal relationships between the variables. Obtaining multi-informant data (e.g. [54] from both parents as well as children's teachers on children's behaviours can provide a more objective assessment. Cultural factors like filial piety [55] and gender role beliefs [44] likely interact with parenting to influence family dynamics in Chinese populations. Examining extended family support [56] would provide further insight into parenting in Chinese culture.

In conclusion, our study found that in a sample of Hong Kong Chinese parents, lower parental income and education level, as well as child personal factors e.g., being male, younger, along with developmental difficulties were associated with child behaviour problems. By enhancing positive, autonomy-granting parenting, interventions can help buffer the impact of socioeconomic disadvantage on child behaviour. Overall, this study offers insight into the mediating role of effective parenting styles in enhancing child behaviour, despite challenges in parental socioeconomic conditions. Developing parental educational programs that focus on training parents in authoritative parenting techniques, which balances warmth and autonomy-granting with reasonable control, may strengthen favourable child behaviour regardless of socioeconomic circumstances.

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Conflicts of Interest

The authors declare no conflict of interest.

Data Availability

The raw anonymous data of this article will be made available by the corresponding authors upon request.

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Unit	Theme	Content	Concept
1	Understanding and addressing the emotional and social development of children and adolescents	Covering key emotional and social developmental milestones, effective strategies for supporting children's emotional growth, and fostering healthy social relationships.	Based on developmental psychology, which examines how individual child grow and change throughout their lives.
2	Recognizing and addressing early mental health issues in children and adolescents	Discussing common mental health issues in children and adolescents, signs and symptoms, and evidence-based approaches to support their mental well-being.	Grounded with principle of early intervention, which focuses on identifying and addressing mental health concerns as soon as possible.
3	Mindfully coping with stress – Mindfulness-Based Stress Reduction (MBSR)	Introducing the principles of MBSR, and ways to incorporate these practices into their daily lives to better manage parenting stress.	With the concept of mindfulness, which involves developing non-judgmental awareness of one's thoughts, feelings, and experiences.
4	Acute stress response – Trauma emotional processing	How to manage the unpredictable stresses in daily life.	It examines enhancing emotional processing with trauma-informed care.
5	Enhancing children's homework, self-care, and daily routines through executive function	How to improve executive function for a set of cognitive skills that help individuals plan, organize, and complete tasks.	It focuses on limit and potential of cognitive load and executive functioning of the child.
6	New Parenting Discipline Model: Combining Skills and Mindful Education	Introducing effective disciplinary strategies with mindfulness techniques, enabling parents to foster a supportive and nurturing environment for their children.	Based on the principles of positive discipline and mindful parenting, which emphasize communication, empathy, and problem-solving.
7	Supporting the Growth of Introverted, Uneasy and Insecure children	Covering strategies for identifying and cultivating their strengths, as well as fostering their self-confidence and resilience.	Based on the strengths-based approach, it focuses on developing and nurturing the unique strengths and abilities of each individual.
8	The Joys and Challenges of Parenting Adolescents: Equipping Parents	Understand the needs adolescents, and how to support their resilience building with support for transitioning to secondary school.	The adolescent age during transition to secondary school faces its own unique challenges and opportunities, focusing on the unique needs and resilience building.

Table S1a: Scope and Sequence of Theme, Content and Concept of Level 1 of PEMH program.

Unit	Level 2 Workshops	Content	Concept
1	Primary 1: Children's discipline and education training - Basic course (4 sessions)	Topics include effective communication, setting boundaries, fostering a growth mindset, and understanding age-appropriate expectations.	Understanding observable behavior and positive discipline, it emphasizes the importance of empathy and problem-solving.
2	Primary 2: Children's discipline and education training - Extended course (3 sessions)	Building on the basic course, it delves deeper into advanced strategies for discipline and education, such as conflict resolution, emotional regulation, and effective praise.	Based on social learning theory and self-determination theory, it aims to foster intrinsic motivation.
3	Primary 1 to 2: Enjoyable homework (5 sessions)	Developing a positive attitude toward homework by incorporating engaging activities, time management techniques, and strategies.	With techniques of cognitive load and gamification, transforming learning to an engaging and enjoyable experience.

4	Primary 3 to 4: Happy children's charter (4 sessions)	Developing social-emotional skills, including empathy, assertiveness, and emotional intelligence, through interactive activities and group discussions.	Grounded in emotional intelligence theory, which highlights the importance of recognizing, understanding, and managing emotions in oneself and others.
5	Primary 3 to 4: Healthy internet usage Basic workshop (2 sessions) and Advanced workshop (4 sessions)	Developing responsible and safe internet usage, including topics such as online privacy, cyberbullying, and managing screen time.	Based on media literacy education, it helps parents to acknowledge the influence of media on behavior.
6	Primary 5 to 6: Adolescent discipline and education training (3 sessions)	Covering discipline and education strategies specific to adolescent development, including topics such as autonomy, identity formation, and peer relationships.	It specifically focuses on the stage of identity vs. role confusion, as well as principles from attachment theory, and Erikson's stages of psychosocial development,
7	Primary 5 to 6: "Growing up" - Learning to interact with the opposite sex (6 sessions)	Developing healthy relationships with the opposite sex, exploring topics such as communication, boundaries, respect, and understanding differences.	Development and maintenance of effective communication and relationships with interpersonal skills.
8	Primary 6: Transitioning to secondary school support (3 sessions)	Supporting transition, through time management, goal setting, stress management, and building social connections.	It focuses on helping students develop effective learning strategies and habits, and encouraging eliciting appropriate resources based on principles from self-regulated learning

Table S1b: Scope and Sequence of Theme, Content and Concept of Level 2 of PEMH program.

	Permissive			**Authoritarian**			**Authoritative**		
Variable	***B* (95% CI)**	□	***p***	***B* (95% CI)**	□	***p***	***B*(95% CI)**	□	***p***
Initial Model									
Constant	2.47***			2.21***			3.60***		
Parent's Sex	-0.07 (-0.16, 0.03)	-0.04	0.170	0.00 (-0.09, 0.09)	0.00	0.992	0.09 (0.01, 0.18)	0.07	0.034
Parent's Age	0.00 (0.00, 0.01)	0.06	0.040*	0.00 (0.00, 0.01)	0.03	0.338	0.00 (0.00, 0.00)	-0.01	0.673
Education Status	-0.05 (-0.08, -0.02)	-0.11	0.003**	-0.02 (-0.05, 0.02)	-0.04	0.313	0.04 (0.01, 0.07)	0.10	0.007**
Marital Status	0.15 (0.02, 0.29)	0.07	0.022*	0.13 (0.00, 0.25)	0.06	0.050	-0.07 (-0.19, 0.05)	-0.04	0.257
No. of Children	0.01 (-0.05, 0.07)	0.01	0.707	0.07 (0.01, 0.12)	0.09	0.015*	-0.09 (-0.14, -0.03)	-0.11	0.001**
Housing (Private Estate)	-0.03 (-0.10, 0.05)	-0.02	0.476	0.03 (-0.04, 0.10)	0.02	0.473	-0.07 (-0.14, 0.00)	-0.07	0.039*
Living with Partners	0.03 (-0.04, 0.09)	0.02	0.426	-0.03 (-0.10, 0.03)	-0.03	0.314	0.03 (-0.03, 0.09)	0.03	0.293

Persons living together	0.01 (-0.03, 0.04)	0.01	0.726	-0.02 (-0.05, 0.01)	-0.04	0.264	0.00 (-0.04, 0.03)	-0.01	0.847
Working Status	-0.07 (-0.14, 0.00)	-0.06	0.061	0.01 (-0.06, 0.08)	0.01	0.743	0.03 (-0.04, 0.09)	0.03	0.388
Household Income	0.01 (0.00, 0.02)	0.05	0.188	0.00 (-0.01, 0.01)	0.02	0.532	0.01 (0.00, 0.02)	0.08	0.034*
Income enough for living?	-0.08 (-0.16, 0.00)	-0.07	0.054	-0.05 (-0.13, 0.02)	-0.05	0.164	0.06 (-0.01, 0.13)	0.05	0.107
Personal History of Mental Disorders	0.17 (0.01, 0.32)	0.07	0.034*	0.11 (-0.04, 0.26)	0.05	0.140	-0.12 (-0.26, 0.02)	-0.05	0.088
Child's Sex	-0.06 (-0.12, 0.01)	-0.05	0.074	-0.10 (-0.16, -0.04)	-0.09	0.002**	0.07 (0.02, 0.13)	0.07	0.013*
Child's Age	0.00 (-0.01, 0.01)	-0.01	0.724	0.00 (-0.01, 0.01)	-0.02	0.510	0.00 (-0.01, 0.01)	0.00	0.872
Child having Developmental Problems	0.21 (-0.03, 0.45)	0.05	0.086	-0.03 (-0.26, 0.20)	-0.01	0.818	0.01 (-0.21, 0.23)	0.00	0.918
Final Model									
Constant	2.39***			2.25***			3.61***		
Parent's Sex	—			—			0.11 (0.03, 0.19)	0.08	0.005**
Parent's Age	0.00 (0.00, 0.01)	0.07	0.024*	—			—		
Education Status	-0.04 (-0.07, -0.02)	-0.10	0.002**	—			0.04 (0.01, 0.07)	0.09	0.010*
Marital Status	0.16 (0.04, 0.29)	0.08	0.012*	—			—		
No. of Children	—			0.06 (0.01, 0.10)	0.07	0.016*	-0.09 (-0.14, -0.05)	-0.12	<0.001***
Housing (Private Estate)	—			—			-0.08 (-0.15, -0.01)	-0.08	0.017*
Working Status	-0.09 (-0.16, -0.02)	-0.08	0.009**	—			—		
Household Income	—			—			0.01 (0.00, 0.02)	0.08	0.017*
Personal History of Mental Disorders	0.17 (0.01, 0.32)	0.07	0.033*	—			-0.12 (-0.25, 0.02)	-0.05	0.091
Child's Sex	-0.06 (-0.13, 0.00)	-0.06	0.058	-0.11 (-0.17, -0.04)	-0.10	0.001**	0.08 (0.02, 0.13)	0.08	0.010*

Child having Developmental Problems	0.21 (-0.03, 0.45)	0.05	0.086	—			—		
Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$									

Table S2: Backward multiple regression analyses summary identifying parenting styles from sociodemographic variables.