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Association between Selected Parental Factors and Early Childhood Challenging Behaviors: A Survey Study in Mae Hong Son

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Abstract

Background: Challenging behaviours in early childhood can disrupt development, necessitating effective management strategies. This study examined the associations between early childhood behaviours and selected parental factors in relation to management of challenging behaviours.

Participants and Methods: A descriptive quantitative survey was conducted with 151 parents and caregivers of children aged 3–6 in Muang Municipality, Mae Hong Son. Data collection employed validated questionnaires assessing reported challenging behaviours (RCB), perceptions of challenging behaviours (PCB), maladaptive management strategies (MM), use of ABC strategies (ABC), and use of functional behaviour assessment (FBA). Multiple regression analysis was performed.

Results: Disruptive behaviours, such as interrupting and talking loudly, were the most frequently reported, reflecting attention- seeking tendencies. Social and emotional behaviours, including indirect expression of needs and temperamental actions, ranked second, followed by shyness- related behaviours. Non-compliance and aggressive behaviours were less frequent, while destructive and self- harming behaviours were the least reported. Maladaptive management strategies were positively associated with the exacerbation of challenging behaviours, whereas ABC strategies, FBA, and caregiver perceptions showed no significant association with behavioural outcomes (adjusted $R^2 = .171$, $F = 5.426$, $p < .05$).

Conclusion and Recommendations: Maladaptive management may exacerbate challenging childhood behaviours, whereas parental training in behaviour management has a preventive effect. Training programs should focus on reducing the use of maladaptive management strategies and promoting positive, evidence-based alternatives.

Keywords: Challenging behaviours, Early childhood, Behavioural management, Parent training

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Introduction

Challenging behaviours in early childhood encompass repeated actions or patterns that disrupt optimal learning, development, or prosocial interactions with peers and caregivers. These behaviours often include tantrums, aggression, defiance, and emotional dysregulation (Meadan et al., 2014). Challenging behaviors are a natural part of development in young children and are particularly common among children with learning and developmental disabilities (Tevis et al., 2022; Nicholls et al., (–2023) . These behaviors, which must be addressed to support healthy development, often arise from a child's limited ability to express emotions, communicate effectively, or regulate impulses. Early childhood challenging behaviours are broadly classified into two categories: internalizing and externalizing behaviours. Internalizing behaviours, such as anxiety, withdrawal, and depression, are often less noticeable but significantly impact emotional wellbeing. Externalizing behaviours, including aggression, hyperactivity, and noncompliance, are more overt and typically draw attention from caregivers and educators (Lulla et al., 2019) . The prevalence of challenging behaviours in early childhood presents a global concern. Estimates indicate that 10- 20% of children worldwide display significant behavioural issues, potentially more prevalent in certain regions due to cultural and socio- economic factors (Cheng & Furnham, 2021; Lulla et al., 2019). Available data suggests that challenging or problematic behaviours are observed in approximately 11.9% of Thai children aged 3–6 years, with prevalence rates ranging from 3.7% to 24.0% among preschool-aged children (Teekavanice et al., 2017).

The consequences of unaddressed challenging behaviours are profound. In the short term, they impair children' s academic performance, social relationships, and family dynamics, often leading to strained caregiver-child interactions (Hammerton et al., 2019) . Long-term outcomes include an increased risk of mental health disorders, such as depression and anxiety, substance abuse, criminal activity, and unemployment in adulthood (Herrenkohl et al., 2010; Wertz et al., 2018) . Additionally, these behaviours can impose significant social and economic burdens on families, educational systems, and public health infrastructure (Koepp et al., 2023).

Multifaceted Factors Contributing to Early Childhood Behaviours

The development of challenging behaviours in early childhood is influenced by a complex interplay of biological, environmental, and social factors. These include child- specific traits such as temperament, developmental delays, and health conditions, as well as external influences like family dynamics, parenting practices, socio-economic status, and community environments (Cheng & Furnham, 2021; Herrenkohl et al., 2010). Among these, parenting knowledge and skills are pivotal determinants of behavioural outcomes. Parents often play a central role in shaping children's early behaviour through their interactions, responses, and caregiving strategies. A lack of appropriate knowledge and skills in effective parenting techniques can exacerbate problematic behaviours in children. For example, parents may inadvertently reinforce undesirable behaviours by giving in to tantrums or failing to provide consistent discipline (Meadan et al., 2014) . Inadequate understanding of child development stages can lead to unrealistic expectations, creating frustration for both the parent and child. Furthermore, parents who lack skills in fostering positive behaviours may resort to punitive or inconsistent disciplinary strategies, which have been shown to escalate behavioural issues over time (Lulla et al., 2019) . Parenting challenges are often compounded by socio-economic hardships, parental mental health problems, and limited access to support systems. Studies indicate that families experiencing poverty or parental mental health issues are less likely to adopt effective parenting practices, further increasing the risk of childhood behavioural problems (Hammerton et al., 2019; Wertz et al., 2018) . Interventions targeting parental education and skill- building, such as evidence- based parenting programs, have demonstrated success in reducing childhood behavioural issues and improving family dynamics (McGilloway et al., 2011). Addressing these multifaceted factors, particularly enhancing parenting knowledge and skills, is critical for mitigating the risks of challenging

behaviours and promoting healthier developmental trajectories.

Parenting knowledge and skills concerning early childhood behaviours encompasses understanding the nature of these behaviours and effective management strategies. Parenting skills to address behaviours can be effectively developed using the ABC model. The ABC model of challenging behaviour management emphasizes addressing triggers (Antecedents), teaching appropriate behaviours (Behaviour, and managing responses (Consequences) to effectively reinforce or discourage specific behaviours. Incorporating Functional Behavior Assessment enable parents to tailor interventions effectively, such as modifying triggers, teaching replacement skills, and adjusting consequences to promote positive behaviours and reduce challenging ones (Meadan et al., 2014). The ABC model is widely used in clinical, educational, and caregiving settings and is a cornerstone in behaviour management. The strengths of the ABC model lie in its holistic and structured approach to understanding and managing behaviours, its focus on addressing triggers, emphasis on preventative strategies, tailored interventions, and reliance on a data-driven process.

This study aimed to examine parenting factors influencing challenging behaviours in children attending early childhood education programs in Mae Hong Son. Challenging behaviours, which include tantrums, aggression, emotional dysregulation, and noncompliance, are common in early childhood and have been observed in approximately 11.9% of Thai children aged 3–6 years, with prevalence rates ranging from 3.7% to 24.0% among preschool-aged children (Teekavanice et al., 2017). These behaviours are influenced by parenting knowledge, perceptions, and skills factors that are essential in shaping children's behavioural outcomes. Therefore, assessing Thai parents' perceptions, skills, and other parenting factors associated with challenging behaviours can guide the development of training programs to better equip parents in managing their children's challenging behaviours effectively.

Ethical Approval

This study was approved by the Institutional Review Board of Chiang Mai Rajabhat University [IRBCMRU 2023/ 228. 07. 06] . Participants were fully informed about the study's purpose and voluntarily decided to participate. Confidentiality was strictly maintained, with all identifying details— such as names, titles, positions, and organizational information— excluded from reports, including this manuscript, to ensure participants' privacy. An email address was not required to access or submit the online questionnaire.

Participants, Materials, and Methods

Participants

This was a descriptive quantitative survey. The population consisted of 248 parents or primary caregivers of children aged 3–6 years enrolled in early childhood education programmes at two schools in Muang Municipality, Mae Hong Son. The sample size was calculated using Cochran's Sample Size Formula (1997), resulting in a required sample size of 151. A simple random sampling was used.

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

N: Total population size = 248

e: Margin of error = 5% (0.05)

p: Estimated proportion of the population with the attribute of interest = 0.5

z: Z-score corresponding to the desired confidence level = 1.96

Instruments

The research instruments included a set of questionnaires: reported childhood challenging behaviours (RCB), perception towards childhood challenging behaviours (PCB), maladaptive management of childhood challenging behaviours (MM), use of ABC strategies, and use of functional behaviour assessment (FBA). These 4-point Likert scales were developed by the researchers, validated by a panel of three experts, and tested for reliability with a similar sample of 30 parents. The content validity index (CVI) for the RCB, PCB, MM, ABC, and FBA was between 0.80 - 0.90, and Cronbach's Alpha

coefficients for reliability were .93, .92, .83, .92, and . 95, respectively. indicate acceptable reliability, while values above 0.90 indicate excellent reliability

The research instruments consisted of five questionnaires: Reported Childhood Challenging Behaviours (RCB), Perception Towards Childhood Challenging Behaviours (PCB), Maladaptive Management of Childhood Challenging Behaviours (MM), Use of ABC Strategies, and Use of Functional Behaviour Assessment (FBA). Each tool used a 4-point Likert scale and was developed by the researchers. Content validity was established through expert review by a panel of three professionals, and reliability was tested with a pilot group of 30 parents. The Content Validity Index (CVI) for all instruments ranged from 0.80 to 0.90, indicating acceptable to high content validity. Cronbach's Alpha coefficients for internal consistency were .93 (RCB), .92 (PCB), .83 (MM), .92 (ABC), and .95 (FBA). According to conventional standards, alpha values above 0.70 indicate acceptable reliability, while values above 0.90 reflect excellent reliability. Thus, all instruments demonstrated strong internal consistency and were deemed reliable for use in this study.

Data Collection

Data was collected between June and August 2024 using online and face- to- face surveys based on participants' preferences. The research team coordinated with contact persons at each school to distribute hard copies and online questionnaire links to participants. Online respondents were required to complete all questions to submit the questionnaire. Contact persons also reminded parents and caregivers to encourage participation and improve the response rate. By the end of the data collection period, 146 participants responded online, and 5 returned hard copies.

Data Analysis

Descriptive statistics were used to describe the characteristics of parents and caregivers, as well as the RCB, PCB, MM, ABC, and FBA variables**.** Multiple regression analysis, using the enter method, was conducted to assess the predictive power of PCB, MM, ABC, and FBA on RCB**.** Statistical analysis was performed using SPSS Version 21**.0.**

Results

General Information

The participants were predominantly mothers (76. 16%) , followed by fathers (18.54%). Grandparents and other caregivers, such as teachers or non-relative caregivers, made up a smaller proportion (1. 99%) . Most participants were female (80.13%), with males comprising 19. 87% . Caregivers' ages ranged from 21 to 65, with a mean age of 34.62 (±6.83). Most caregivers were between 31–40 years old (53.64%). Over half of the caregivers held a bachelor's degree (52. 32%) , while secondary education accounted for 33.77%. Only 1.99% of caregivers reported no formal education. The most common occupations were government officials or state enterprise employees (37.75%) and daily wage workers (20. 53%) . Others included private sector employees (7.95%) and traders (9. 27%) . The monthly income of caregivers ranged from 0 to 56,200 THB, with a mean of 14,796. 72 THB (±10,976. 43) . The majority earned between 5,001 and 10,000 THB (33.11%). Most caregivers (84.77%) had prior experience in early childhood care, with an average experience duration of 5. 07 years (±4.72). About half of the caregivers (50.99%) had undergone training to manage undesirable behaviors in children.

Table 1 Characteristics of Caregivers (N = 151)

Characteristics	N	%
Status of Caregivers		
Father	28	18.54
Mother	115	76.16
Grandfather/Grandmother	3	1.99
Teacher/Caregiver	2	1.32
Others	3	1.99
Gender		
Male	30	19.87
Female	121	80.13
Age		
≤ 30	45	29.80
31-40	81	53.64
> 40	25	16.56
Level of Caregiver's Education		
No formal education	3	1.99
Primary education	7	4.64
Secondary education	51	33.77
Bachelor's degree	79	52.32
Postgraduate education	11	7.28
Occupation of Caregivers		
Unemployed	8	5.30
Farmer	2	1.32
Trader	14	9.27
Daily wage worker	31	20.53
Government official/State enterprise employee	57	37.75
Private sector employee	12	7.95
Others	27	17.88
Approximately Income of Caregivers		
≤ 5,000	19	12.58
5,001 – 10,000	50	33.11
10,001 – 15,000	36	23.84
15,001 – 20,000	11	7.28
20,001 – 25,000	8	5.30
25,001 – 30,000	14	9.27
> 30,000	13	8.61
Experience of Early Childhood Care		
Never	23	15.23
Ever	128	84.77
≤ 5 years	66	51.56
6-10 years	53	41.41
11-15 years	5	3.91
> 15 years	4	3.12
Access to Information/Knowledge on Childcare		
Never	20	13.25
Ever	131	86.75
Training in Childcare Skills		
Never	56	37.09
Ever	95	62.91
Training in Managing Undesirable Behavior		
Never	74	49.01
Ever	77	50.99

Table 2 Childhood Challenging Behaviors Reported by Parents/Caregivers (N = 151)

Behavior	Frequency of Behavior Exhibitions									
	Always (n)	%	Frequently (n)	%	Sometimes (n)	%	Rarely (n)	%	Never (n)	%
Disruptive Behaviors										
Interrupting or disturbing others	4	2.6	25	16.6	67	44.4	38	25.2	17	11.3
Talking in groups without paying attention to lessons	5	3.3	23	25.2	54	35.8	48	31.8	21	13.9
Talking or shouting loudly	2	1.3	24	15.9	49	32.5	57	37.7	19	12.9
Cutting in line	1	0.7	3	2.0	19	12.6	69	45.7	59	39.1
Breaking classroom rules	3	2.0	2	1.3	40	26.5	65	43.0	41	27.2
Non-Compliance										
Disobeying instructions	3	2.0	11	7.3	50	33.1	59	39.1	28	18.5
Fighting or quarreling	1	0.7	12	7.9	34	22.5	71	47	33	21.9
Aggressive Behaviors										
Pushing others	0	0	5	3.3	22	14.6	69	45.7	55	36.4
Physically harming or fighting	0	0	4	2.6	11	7.3	53	35.1	83	55.0
Using foul language or swearing	0	0	6	4.0	25	16.6	76	50.3	44	29.1
Destructive and Self-Harming Behaviors										
Damaging property	2	1.3	8	5.3	22	14.6	62	41.1	57	37.7
Self-harming behavior	0	0	2	1.3	7	4.6	47	31.1	95	62.9
Social and Emotional Behaviors										
Displaying behavior to express needs indirectly instead of directly	2	1.3	18	11.9	40	26.5	58	38.4	33	21.9
Being temperamental or self-centered	5	3.3	23	15.2	47	31.1	58	38.4	18	11.9
Being possessive of toys and unwilling to share	4	2.6	18	11.9	43	28.5	63	41.7	23	15.2
Shyness or Avoidance										
Lacking the confidence to express themselves or share opinions	3	2.0	16	10.6	47	31.1	58	38.4	27	17.9
Hesitating to ask questions	2	1.3	13	8.6	36	23.8	59	39.1	41	27.2
Fearful of or avoiding playing with peers	3	2.0	4	2.6	16	10.6	55	36.4	73	48.3
Isolating Oneself from Others	3	2.0	2	1.3	9	6.0	57	37.7	80	53.0

Table 3 Level of parental perception and parenting skills related to challenging behaviours

Variables	Mean	SD.	Interpretation
PCB	61.50	7.388	Very good
MM	21.17	6.310	Moderately bad
ABC	76.93	14.249	Good
FBA	17.36	5.036	Good

Table 4 Factors Predicting Challenging Behaviors in Early Childhood

Variables	B	Std. Error	Beta	t	p-value
PCB	.015	.118	.010	.131	.896
MM	.741	.160	.430	4.630	.000*
ABC	-.031	.093	-.041	-.333	.739
FBA	-.027	.226	-.013	-.121	.904
Access to childcare information	.037	2.699	.001	.014	.989
Ever trained in childcare	3.060	2.333	.136	1.312	.192
Ever trained in behaviour management	-5.387	2.140	-.248	-2.518	.013*

R^2 = .210, R^2 adjust = .171, F = 5.426, *p < .05

The multiple regression analysis revealed that the overall model was statistically significant ($p < 0.05$) , indicating that the predictors collectively explain a significant portion of the variance in Challenging Childhood Behaviours. Among the predictors, maladaptive management strategies ($B = 0.741$, $p = 0.000$) emerged as the strongest positive predictor, while " Ever Trained on Behavioural Management" ($B = -5.387$, $p = 0.013$) was the only other significant predictor, demonstrating a negative effect on Challenging Childhood Behaviours. The remaining predictors, including PCB, ABC, FBA, Access to Information about Childcare, and Ever Trained on Childcare, did not significantly contribute to the model. These findings highlight that maladaptive management strategies and Ever Trained on Behavioural Management are the primary factors influencing variations in the dependent variable, Challenging Childhood Behaviours.

Discussion

Frequencies of challenging behaviors

Based on parents' and caregivers' reports, the frequencies of challenging behaviors vary across categories. Disruptive behaviors are the most frequently reported, with a notable proportion of participants observing behaviors like interrupting or disturbing others, talking in groups without paying attention, and talking or shouting loudly, occurring frequently or sometimes. These behaviors are likely tied to children's natural tendencies to seek attention or interact with peers, especially in group settings like classrooms. Social and emotional behaviors rank second in prevalence, with challenges such as indirect expression of needs, being temperamental, and possessiveness over toys being observed " frequently" or " sometimes. " These behaviors reflect difficulties in emotional regulation and social interactions, common in early childhood. Shyness- related behaviors, including hesitating to ask questions, lacking confidence, or avoiding peers, are moderately prevalent. While many children exhibited these behaviors " rarely" or " never," a small but significant proportion experienced them frequently, indicating areas where confidence-building interventions may be beneficial. Non-compliance behaviors, such as disobeying instructions and fighting or quarreling, occurred less frequently but remain a concern. Disobedience was reported " frequently" by 7.3%, while fighting or quarreling was even less prevalent. These findings suggest that while some children struggle with authority or rules, such behaviors are not widespread. Aggressive behaviors, such as pushing, physically harming others, or using foul language, were relatively rare. Most respondents reported these behaviors

as "rarely" or "never," indicating effective social and emotional regulation in most children. Destructive and self-harming behaviors were the least frequent, with the majority of participants reporting "never" or "rarely" for behaviors like damaging property or self- harming. These behaviors may be indicative of underlying emotional distress when present but are not common across the sample.

Interestingly, the overall prevalence of challenging behaviours in this population appears lower than what has been reported in studies from other regions or populations (e.g., Tevis et al., 2022; Nicholls et al., 2023). One possible explanation is the strong influence of cultural norms that emphasize respect for authority, emotional restraint, and collective harmony values that may promote better behavioural regulation in group settings. Moreover, the close-knit nature of families and community structures in Mae Hong Son may provide consistent social support and supervision, mitigating the risk of behavioural escalation. These contextual factors may account for the relatively low incidence of aggressive and self-harming behaviours observed in this study, compared to higher rates reported in more urbanized or individualistic settings.

The findings highlight disruptive behaviors as the most prevalent, indicating a need for interventions targeting classroom management and attention regulation. Social and emotional behaviors, while less frequent, suggest areas for improvement in emotional intelligence and peer interactions. Shyness and avoidance, though not highly prevalent, require targeted confidence- building for affected children. Finally, the low prevalence of aggressive, non-compliant, and destructive/ self- harming behaviors suggests a generally well- regulated sample, though these behaviors should still be addressed on a case- by- case basis to support affected children.

Maladaptive management and challenging behaviours in early childhood

The findings of this study revealed that maladaptive management (MM) strategies such as punitive responses, inconsistent discipline, and neglect of underlying causes were commonly associated with increased incidence and persistence of challenging behaviours in children. These strategies often exacerbate the behaviours rather than mitigate them. Previous research supports this, indicating that such approaches fail to address the root causes and may inadvertently reinforce the behaviours through negative attention (Staton, 2019). For instance, harsh or punitive methods can heighten anxiety and defiance, creating a cyclical pattern of worsening behaviour (Roberts & Kaiser, 2011). Moreover, children may imitate adults' use of maladaptive strategies, internalizing and normalizing these behaviours as appropriate responses (Sutherland, 2008). These findings underscore the importance of adopting positive and proactive management techniques

Training on behavioural management and challenging behaviours in early childhood

The finding that training on behavioural management is negatively associated with challenging childhood behaviours is consistent with evidence suggesting that targeted interventions and training programs can equip caregivers, teachers, and practitioners with effective strategies to manage and reduce problematic behaviours. Such training often focuses on positive reinforcement, de- escalation techniques, and structured interventions tailored to the needs of children, which can effectively mitigate challenging behaviours (Sanders et al., 2014). Behavioural management training increases the caregiver's or practitioner's confidence and competency in addressing challenging behaviours. Training programs emphasizing proactive and preventive strategies may replace maladaptive management with socially acceptable alternatives (Horner et al., 2010). As the analysis indicates, maladaptive management is positively associated with challenging childhood behaviours, highlighting the counterproductive nature of harsh or unstructured interventions. Training likely reduces reliance on these strategies, indirectly decreasing challenging behaviours (Biglan et al., 2012). As practitioners implement these strategies, children may experience a reduction in behaviours associated with frustration, non-compliance, or aggression. Caregivers and practitioners who are better equipped with such knowledge are likely to adopt empathetic and adaptive approaches, which create a more supportive environment for children, further

reducing the frequency and intensity of challenging childhood behaviours (O'Neill et al., 2015).

Use of ABC strategies and challenging behaviours in early childhood

The Antecedent- Behaviour-Consequence (ABC) framework is a core element of behaviour management strategies. While its use can effectively identify patterns in challenging behaviours, its predictive capacity may be limited. This limitation arises because ABC strategies primarily focus on existing behaviours rather than addressing systemic or developmental factors that might contribute to behavioural challenges (O' Neill et al., 2015). Moreover, the effectiveness of ABC strategies may depend on consistent application and caregiver skill level. If inconsistently applied or poorly understood, ABC strategies may fail to yield meaningful improvements in behaviour (Kiartsuwan et al., 2023).

Use of functional behavious assessment and challenging behaviours in early childhood

Functional behaviour assessments are critical in understanding the " why" behind challenging behaviours by identifying their functional purpose (Sugai et al., 2000). However, the inability of FBAs to predict behaviours could stem from the complexity and multifactorial nature of behaviour in early childhood. Factors like neurodevelopmental delays, family dynamics, and environmental stressors often play significant roles that FBAs might not fully account for. Additionally, while functional behaviour assessments identified triggers and reinforcements for specific behaviours, it may not capture broader influences, such as socio-emotional development or caregiver- child interactions, that contribute to behavioural challenges. This limitation could explain its lack of association with behavioural prediction.

Parents' perception, access to childcare information and training and challenging behaviours

While caregiver knowledge and attitudes about behaviour management are important, their impact on actual behaviour management practices may be limited. Research indicates that knowledge does not always translate into effective action due to barriers like stress, limited resources, or lack of confidence (AKTU, 2024). Furthermore, caregivers may struggle with implementation if they lack practical strategies or support systems. Behavioural outcomes in children are influenced by an interplay of caregiver practices, environmental factors, and child characteristics (C r n i c , 2017) . This complexity suggests that knowledge and attitudes alone are insufficient to predict behavioural outcomes, emphasizing the need for systemic and skills-based interventions.

Access to childcare information and general childcare training does not significantly influence changes in challenging childhood behaviours because these resources often focus on broad caregiving topics rather than the specific behavioural management strategies needed to address complex behavioural issues (Belsky et al., 2007). Training programs that lack targeted, hands- on components or follow- up support may fail to equip caregivers with practical tools for managing challenging behaviours. Furthermore, the complexity of challenging childhood behaviours, influenced by various environmental, familial, and individual factors, often requires specialized interventions, which general childcare information and training may not provide (Horner et al., 2010). These findings highlight the need for integrating behavioural management components into childcare training to address challenging behaviours effectively.

Conclusion

The multiple regression analysis identifies maladaptive management as a robust and significant positive predictor of challenging childhood behaviours, indicating that higher levels of maladaptive management are associated with increased challenging childhood behaviours. Conversely, Ever Trained on Behavioural Management is a significant negative predictor, suggesting that training in behavioural management is related to a reduction in challenging childhood behaviours. These findings highlight the potentially detrimental effects of maladaptive management strategies in contributing to challenging behaviours, emphasizing the importance of behavioural management training as an effective intervention to mitigate such behaviours.

Efforts should focus on reducing maladaptive management strategies by providing training on evidence- based behavioural management techniques, such as positive reinforcement and functional behaviour assessments, to caregivers and educators. Behavioural management training should be made widely accessible and integrated into professional development programs, with ongoing support to ensure effective implementation. Research should investigate the long- term effectiveness of behavioural management training and its ability to mitigate challenging childhood behaviours across diverse settings and populations. Additionally, studies should explore the specific mechanisms by which maladaptive management strategies contribute to challenging childhood behaviours and how interventions can be tailored to high-risk groups.

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