Do parental factors mediate the association between child anxiety and life interference among young children?

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None

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The study has been approved by the University of Oxford's Medical Sciences Interdivisional Research Ethics Committee (Reference: R62531/RE001). Written consent was obtained from parents/carer for screening.

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Abstracts

This study examined whether parental anxiety and self-efficacy mediate the relationship between child anxiety symptoms and functional impairment in young children. Parents/carers (N = 853) of children aged 4–7 years who screened positive for elevated anxiety completed measures of child anxiety symptoms, functional impairment, parental anxiety, and parental self-efficacy. Multiple mediation analysis revealed significant indirect effects of child anxiety symptoms on functional impairment through both parental anxiety (β = .0127, 95% CI [.0041, .0235]) and parental self-efficacy (β = .0062, 95% CI [.0002, .0138]). Although effect sizes were modest, these findings identify parental factors as potential intervention targets. However, the cross-sectional design precludes causal inference; longitudinal and experimental studies are required before translating these findings into treatment recommendations. Prospective and intervention studies are needed to establish causality and evaluate whether targeting these parental factors reduces child functional impairment.

Keywords

Anxiety, Young children, Parental anxiety, Parental self-efficacy, Mediation analysis

Introduction

Anxiety disorders are widely acknowledged to be the most prevalent mental health problem across the lifespan and the age of onset for anxiety disorders is often in childhood (Solmi et al., 2022). Although studies of anxiety disorders in children often focus on middle childhood and adolescence (e.g. from age 7 or 8 years), studies including younger children report prevalence rates of 10 to 20% for anxiety disorders among children aged 2 to 5 years (Franz et al., 2013). Given that childhood anxiety disorders often persist into adulthood, early identification and intervention for young children at risk for anxiety disorders may be a critical step to prevent this potential long term trajectory (Schwartz et al., 2019).

Previous reviews indicate that CBT is an effective intervention (targeted and treatment) approach for young children (Howes Vallis et al., 2020; Zhang et al., 2017). However, change in intervention targets are not consistently reported (Bayer et al., 2018; Morgan et al., 2016), and the mechanisms of change from the intervention remain unclear. Identifying mediators of mechanisms of change would allow us to optimise the content and focus of future interventions.

Recent recommendations on reporting on child anxiety treatment trials encourage the use of measures of interference associated with anxiety symptoms because families consider functional impairment as a particularly a meaningful outcome and measures of interference align well with diagnostic outcomes (Creswell et al., 2021). However research has tended to focus on the assessment

and classification of anxiety symptoms, with less attention paid to evaluating the impacts of these symptoms on daily life functioning (Swan and Kendall, 2016).

Anxiety symptoms can disrupt children's daily functioning through interconnected pathways. Avoidance of feared situations may limit participation in developmentally important activities such as peer interactions and school involvement (Langley et al., 2014), while concentration difficulties and physiological arousal can further impair functioning (Walkup et al., 2008). Reflecting growing recognition of functional impairment in child anxiety, several assessment questionnaires have recently been developed. For example, the Child Anxiety Life Interference Scale (CALIS) (Lyneham et al., 2013) assesses the impact of anxiety symptoms on daily functioning among children aged 7-17 years, and the parent-report version of the CALIS has been adapted for younger children aged 3-7 years (CALIS-PV) (Gilbertson et al., 2017). The CALIS-PV assesses the extent to which anxiety symptoms interfere with young children's daily lives within the key domains of at home, outside home, and on parents' lives.

To date child anxiety symptoms and associated interference have tended to be considered as distinct outcomes, with very little consideration of their association and what might account for the extent to which anxiety symptoms are associated with life interference. Although studies have found multiple family factors to be a significant buffer against anxiety symptoms and life interference (Hudson et al., 2019), the mediators and moderators of the association between them is less clear.

Two possible mediators of the associations between anxiety symptoms and interference are a) parental anxiety (Ahmadzadeh et al., 2021), and b) parental self-efficacy (Jones and Prinz, 2005) on the basis that these variables may affect how parents respond to their child's anxiety symptoms, and consequently how they perceive and report their child's functional difficulties. For example, parents of children with anxiety disorders who themselves have elevated anxiety have been found to respond to their children's expressions of anxiety with more negative affect and behaviour than parents with lower levels of anxiety (Creswell et al., 2013). Similarly parental self-efficacy or "belief about their ability to influence their child in a health and success-promoting manner" (Eccles and Harold, 1996) has been found to be positively associated with effective parenting and parental competence (Jones and Prinz, 2005). However, up to date there are no studies that have evaluated this association at young children age and used at-risk sample.

This study had two aims. The conceptual aim was to examine potential mechanisms linking child anxiety symptoms to life interference in young children, focusing on parental anxiety and self-efficacy as mediating pathways. The analytic aim was to test a cross-sectional multiple mediation model quantifying indirect effects through each parental factor. We hypothesized that both parental anxiety and self-efficacy would significantly mediate the association between child anxiety symptoms and life interference in young children (aged 4-7 years). The study is a cross-sectional secondary analysis of baseline data collected as part a cluster randomized controlled trial evaluating a parent-led

online intervention for young children at-risk of anxiety disorders (MYCATS trial; see Reardon et al., 2022 for full study details).

Methods

Participants

Data were from baseline assessments of the MY-CATS trial, a cluster randomized controlled trial evaluating therapist-guided, parent-delivered online CBT for children aged 4-7 years at risk of anxiety disorders. Participants were recruited from 95 primary/infant schools in England. Parents/carers of all children in participating classes completed online screening questionnaires. Children who screened positive for elevated anxiety symptoms, behavioral inhibition, and/or parent anxiety were invited to participate. Of 865 parents/carers who completed baseline questionnaires, 853 (98.6%) had complete data on all analysis variables and comprised the final sample. Sample characteristics are in Table 1.

Measures

Child anxiety symptoms were assessed using the Preschool Anxiety Scale; PAS (Spence et al., 2001). Interference caused by the child's anxiety was measured using the Child Anxiety Life Interference Scale-Preschool Version; CALIS-PV (Gilbertson et al., 2017). Parent anxiety symptoms were assessed using the 7-item Generalised Anxiety Disorder Scale (GAD-7). Parenting self-efficacy was measured using the 7-items self-efficacy subscale of the Parenting Sense of Competence Scale;

PSOC-SE (Johnston and Mash, 1989). The PSOC-SE is a widely used measure of parenting self-efficacy, and its reliability and validity have been confirmed with parents of children aged 4-9 years (Johnston and Mash, 1989; Jones and Prinz, 2005).

Statistical analysis

Zero-order correlations were first examined. Multiple mediation analysis was conducted using PROCESS macro V4.1.1 (Hayes, 2022) in R, with child anxiety symptoms (PAS) as the independent variable, parental anxiety (GAD-7) and parental self-efficacy (PSOC-SE) as mediators, and functional impairment (CALIS) as the dependent variable, controlling for child age and gender. The direction of this model was specified based on theoretical and empirical considerations. Developmental theory suggests that child anxiety symptoms typically emerge before associated functional impairment, as interference develops when anxiety-driven avoidance accumulates over time (Langley et al., 2004). This directional model aligns with the intervention logic of the parent-led CBT (MY-CATS), which targets parental factors to reduce child anxiety and associated interference. While cross-sectional data limit causal inference, this model provides a theoretically coherent framework for examining these indirect associations. Indirect effects were tested using bias-corrected bootstrap procedures (5,000 samples, 95% CI). Effects were considered significant when 95% CIs excluded zero.

Participants were recruited from multiple schools, but analyses were conducted at the individual level, consistent with prior child anxiety research using screen-positive samples where

school-level variance is negligible (Lyneham and Rapee, 2006; Rapee et al., 2005). Missing data were handled using complete-case analysis (listwise deletion). Of 865 participants, 12 (1.4%) were excluded due to missing data. Little's MCAR test confirmed data were missing completely at random ($\chi^2 = 1.57$, df = 3, $p = .667$).

Results

All zero-order correlations among the primary study variables were significant ($p < .05$) and showed that the PAS was positively associated with the CALIS (r = 0.68), GAD-7 (r = 0.20), and negatively associated with the PSOC-SE (r = -0.14). The CALIS was correlated positively with the GAD-7 (r = 0.22) and negatively associated with the PSOC-SE (r = -0.16). The GAD-7 was negatively associated with PSOC-SE (r = -0.13).

As shown in Figure 1, the overall multiple mediator model was significant, $R^2 = .54$; F (3, 849) = 27.15, $p < .001$. Specifically, the PAS was significantly associated with the CALIS [path c; t (849) = 27.15, $p < .001$], the GAD-7 [path a1; t (849) = 5.78, $p < .001$] and the PSOC - SE [path a2; t (849) = -4.19, $p < .001$]. The GAD-7 and PSOC-SE were also significantly associated with the CALIS [path b1; t (849) = 3.18, $p < .001$; path b2; t (849) = -2.15, $p < .001$ respectively]. When controlling for the mediator variables of GAD-7 and PSOC-SE, the PAS was still significantly associated with the CALIS [path c'; t (849) = 25.73, $p < .001$]. However, as shown in Table 2, the path through the GAD-7 yielded a significant indirect effect between the PAS and the CALIS (indirect effect: GAD-7

= .0127, 95% CI: LL= .0041 to UL= .0235), as did the path through the PSOC-SE (indirect effect: PSOC-SE = .0062, 95% CI: LL= .0002 to UL= .0138). To contextualize the magnitude of these effects, the proportion of the total effect mediated through GAD-7 was 2.3%, through PSOC-SE was 1.1%, and through both mediators combined was 3.5%. These values indicate that parental factors accounted for approximately 3.5% of the association between PAS and CALIS.

Discussion

Our findings that parent reported child anxiety symptoms were significantly associated with anxiety related life interference and both parental anxiety and parental self-efficacy replicate previous research (e.g. Gilbertson et al., 2017; Lyneham et al., 2013). In addition, this study highlights a potential role of parental anxiety and efficacy in accounting for the relationship between child anxiety symptoms and associated interference among children aged 4-7 years. While longitudinal or experimental designs are required, this raises the interesting possibility that improving parental anxiety and parental self-efficacy may reduce life interference caused by child anxiety symptoms and may be useful targets in programs for parents of young children with elevated anxiety symptoms. These findings could potentially have important intervention and prevention implications. There are few parents-young child programs that have explicitly targeted parental anxiety and cognition. To development the treatment and prevention for anxiety disorders in young children, perhaps a stronger

emphasis on parent-child interactions is required in parent-led interventions to influence both children's anxiety symptoms and life interference.

Our findings suggest modest indirect effects of parental factors on child anxiety (3.5%). Emerson et al. (2019) and McLeod et al. (2007) reported that parental control and experiential avoidance explained 2-7% of variance in child anxiety. The modest mediation in our study likely reflects our focus on general parental psychological characteristics rather than specific behaviors, the younger sample age (4–7 years), use of a screen-positive sample, and cross-sectional underestimation (Maxwell and Cole, 2007). Despite the modest magnitude of these effects, Hayes (2022) emphasizes that statistically significant indirect effects provide valuable information about pathways linking variables, regardless of their magnitude. When interpreted in context, small effects may be clinically meaningful if they identify modifiable targets, are consistent across studies, or have practical implications for population level interventions.

These findings link to cognitive-behavioral therapy, and potentially particularly parent-led CBT which has demonstrated effectiveness in community settings (Breinholst et al., 2021). Parental factors can facilitate or impede core CBT processes including exposure and cognitive restructuring (Bögels and Brechman-Toussaint, 2006). Parental anxiety may promote accommodation and threat modelling that reinforce avoidance (Creswell et al., 2013), while low self-efficacy may undermine treatment engagement. Future studies would helpfully explore whether these factors predict CBT response, beyond established predictors of treatment outcome (Orlando et al., 2022), while

recognising that reverse causation cannot be excluded, as child impairment may also increase parental anxiety (Maxwell and Cole,2007).

Limitations and Conclusions

First, this is a cross-sectional study, and we cannot establish temporal causality, not causal mechanisms of change. Assessing mediational pathways through longitudinal studies will be essential in future research. Second, only parent-report measures were used, introducing shared method variance (Podsakoff et al., 2003). Parental emotional distress may bias perceptions of child impairment rather than reflect actual functioning (Krain and Kendall, 2000), potentially inflating observed pathways; multi-informant designs incorporating teacher reports or observations are needed to clarify this. Before translating findings into treatment targets, longitudinal studies establishing temporal precedence and experimental studies demonstrating that modifying parental factors causally reduces child impairment are required. Additionally, the sensitivity and robustness of our findings are limited by model specification choices. Although the model directionality was informed by the MY-CATS trial design and anxiety theory, alternative specifications could yield different results.

In conclusion, parental anxiety and self-efficacy significantly mediated the relationship between children's anxiety symptoms and life interference. Future research should focus on elucidating the direction of these relationships and, if indicated, exploring the value of focusing on boosting parental anxiety and efficacy to reduce the life interference caused by anxiety symptoms in young children.

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Table 1 Sample Characteristics (N=853)

Characteristic	n (%) / mean (SD)
Child gender	
Female, n (%)	428 (50.2)
Child age	
4 years, n (%)	133 (15.6)
5 years, n (%)	252 (29.6)
6 years, n (%)	283 (33.2)
7 years, n (%)	185 (21.7)
Child ethnicity	
White British	699 (82.0)
White Other	44 (5.2)
Black or Black British	9 (1.1)
Asian or British Asian	27 (3.2)
Mixed ethnic background	67 (7.9)
Other ethnic background	4 (0.5)
Prefer not to say / missing	3 (0.4)
Parent gender	
Female, n (%)	798 (93.6)
Parent age	
20-29, n (%)	65 (7.6)
30-39, n (%)	454 (53.2)
40-49, n (%)	228 (26.7)
50-69, n (%)	10 (1.2)
missing	*96 (11.3)*
Parent highest level of education	
School completion, n (%)	50 (5.9)
Further education, n (%)	288 (33.8)
Higher education / postgraduate, n (%)	495 (58.0)
None of the above, n (%)	9 (1.1)
Prefer not to say, n (%)	11 (1.3)
Index of Multiple Deprivation Decile[a]	
1st and 2nd	140 (16.4)
3rd and 4th	175 (20.5)
5th and 6th	202 (23.7)
7th and 8th	165 (19.3)

9th and 10th	171 (20.0)
PAS, mean (SD)	41.5 (16.8)
CALIS-PV, mean (SD)	22.8 (13.4)
PSOC-SE, mean (SD),	27.7 (5.7)
GAD-7, mean (SD)	7.6 (5.0)

Note. PAS: Preschool Anxiety Scale; CALIS-PV: Child Anxiety Life Interference Scale-Preschool Version; PSOC-SE: Parenting Sense of Competence Scale-self-efficacy subscale; GAD-7: Generalised Anxiety Disorder Scale-7.

a=Measure of relative deprivation for small areas derived from family's postcode; 1=most deprived area in England, 10=least deprived area in England

Table 2
Results of Multiple Mediation Analyses- Direct effect, Indirect effect and Confidence Intervals

	Estimate	SE	95% CI	
			Low	Upper
PAS → CALIS c	0.546	0.020	0.506	0.585
PAS → CALIS c'	0.527	0.021	0.487	0.567
PAS → GAD-7	0.059	0.010	0.039	0.079
PAS → PSOC-SE	-0.049	0.012	-0.072	-0.026
GAD → CALIS	0.215	0.067	0.082	0.348
PSOC-SE → CALIS	-0.126	0.058	-0.241	-0.011
indirect effects				
	Estimate	bootSE	95% CI	
			Low	Upper
Total	0.018	0.006	0.008	0.032
PAS → GAD-7 → CALIS	0.012	0.005	0.004	0.023
PAS → PSOC-SE → CALIS	0.006	0.004	0.003	0.013

Note PAS = Preschool Anxiety Scale, GAD-7 = Generalised Anxiety Disorder Scale, PSOC-SE = Parenting Sense of Competence Scale- Self-Efficacy , CALIS = Child Anxiety Life Interference Scale-Preschool Version

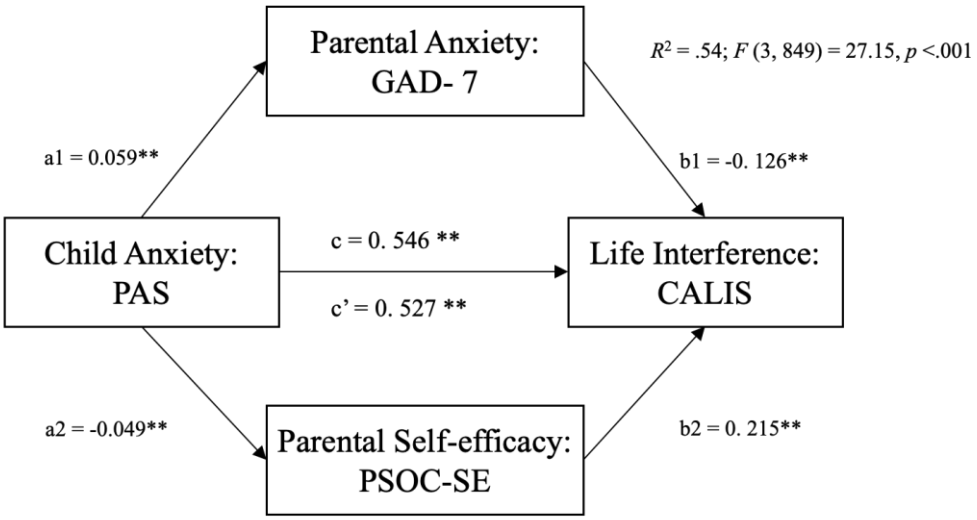

Figure 1 A multiple Mediation Model: PAS, GAD-7, Parents self-efficacy, and CALIS.

Note. PAS = Preschool Anxiety Scale, GAD-7 = Generalised Anxiety Disorder Scale,
PSOC-SE = Parenting Sense of Competence Scale- Self-Efficacy,
CALIS = Child Anxiety Life Interference Scale-Preschool Version