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ARTICLE

The Relationship of Family Accommodation with Pediatric Anxiety Severity: Meta-analytic Findings and Child, Family and Methodological Moderators

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Abstract
Given the importance of family accommodation for the course, treatment and prognosis of anxiety in pediatric populations, we conducted a meta-analysis to estimate the magnitude and potential moderators of the relationship between accommodation and anxiety severity. Study selection criteria were: (1) included quantitative measures of accommodation and anxiety severity, (2) sampled participants younger than 19 years, (3) a sample size greater than 10, (4) reported statistical data needed to compute effect sizes, and (4) be in English or Spanish. Search procedures included assessment of electronic databases, systematic reviews and empirical studies, and email inquiries. Effect size was Pearson correlation coefficient, assuming a random-effects model. Positive moderate association was observed for measures administered to parents. This was moderated by the percentage of children with separation anxiety and selective mutism. Global effect sizes were small for measures administered to children and when accommodation was reported by parents and anxiety by children. Implications for assessment and treatment are discussed.

Keywords Meta-analysis · Family accommodation · Anxiety severity · Pediatric

Introduction

Anxiety disorders are common in youth [1, 2] and associated with impairment in family, social and school areas [3]. Attachment behaviors, parental proximity, or facilitating avoidance are instinctive actions of parents in response to children's fears and anxiety. Although these protective behaviors are usually adaptive, they can be detrimental when reinforcing unreasonable and excessive anxiety. Family accommodation (FA) includes a variety of behaviors performed by family members (especially parents) with the goal of helping to mitigate distress, impairment and/or help function [4].

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While FA can be a product of well-intentioned behaviors by family members, it can be deleterious to anxiety course and prognosis through the behavioral mechanisms by which it operates. Parental accommodation (similar to avoidance and other safety behaviors) is negatively reinforcing by reducing the child's distress triggered by fear-provoking stimuli and situations. FA also is negatively reinforcing for parents, whom may relieved by reducing the child's suffering. Additionally, the excessive attention from parents that results from FA may be positively reinforcing to the child [5]. These operant mechanisms increase the chance for future accommodating behaviors and thereby maintain anxiety symptoms by virtue of the child being prevented from realizing that certain stimuli do not pose a real risk. Furthermore, the child is not allowed to develop and practice adaptive coping strategies when the risk is present [6, 7].

The phenomenon of accommodation was initially studied in obsessive–compulsive-disorder (OCD). Findings suggested strong associations with clinical variables such as symptom severity, impairment, externalizing and internalizing behaviors [8–10] and with poor treatment response [9–12]. Consequently, accommodating behavior has become a critical target of family-based CBT for pediatric OCD [13].

However, FA is not limited to OCD and is observed across all anxiety disorders with levels comparable to that associated with OCD [14].

Family Accommodation in Anxiety Disorders

Several studies reported a majority of parents (86–100%) of children with anxiety disorders endorsed at least some form of accommodation [6, 7, 15–20] with 61% to 80.7% reporting daily accommodation [14, 20]. More than 70% of parents experienced distress due to accommodation and more than 85% reported negative consequences on child behavior when they did not accommodate [6, 18]. There are numerous examples of accommodation behaviors, and they are usually linked to type of anxiety disorder. For instance, providing reassurance, or facilitating avoidance are typical in generalized anxiety disorder (GAD). In social phobia, parents could be required to accompany or act in place of the child. In separation anxiety, they could be asked to sleep next to child, or modify their schedules to avoid separations. Overall, providing reassurance and facilitating avoidance are the most frequently reported behaviors [7, 14, 15, 17, 20].

Assessment of Family Accommodation

The increased interest of FA in anxiety symptoms has motivated the development of several specialized measures. The *Family Accommodation Scale Anxiety (FASA)* [18] includes 9 items assessing frequency of participation in symptoms and modification of family routines. This measure also includes four additional items to rate distress and consequences of accommodation. The FASA has demonstrated good internal consistency, test–retest reliability, and convergent and discriminant validity [18, 21]. A 16-item child-report version of FASA is also available [17]. The *Pediatric Accommodation Scale* (PAS) [15] has clinician- and parent-rated formats to measure frequency and impact of accommodation. The PAS has shown adequate internal consistency, convergent validity, and inter-rater reliability. The *Family Accommodation Checklist and Interference Scale* (FACLIS) [19] identifies a broad range of specific accommodation behaviors and their associated interference. The scale yields three scores, Accommodation Scope, Total Interference, and Mean Interference. The FACLIS has shown adequate internal consistency, and convergent and discriminant validity. The *Parenting Anxious Kids Ratings Scale-Parent Report* (PAKRS-PR) [22] includes the Accommodation and Beliefs subscale with six items assessing parents' behaviors aimed to reduce child anxiety, and beliefs about child's anxiety. This subscale demonstrated good internal consistency and was significantly correlated with the FASA. Finally, Meyer et al. [23] have developed the *Parental Accommodation Scale* (PAS) measuring the frequency of accommodation (PAS-Behavior subscale) and parent's beliefs about accommodation (PAS-Belief subscale). Internal consistency was good, showing convergent validity with FASA.

Addressing Family Accommodation in Treatment

As in pediatric OCD, FA has an impact in treatment outcomes for childhood anxiety disorders. Higher levels of FA at pretreatment have been associated with attenuated treatment response [16] while reductions in FA after CBT predict symptom improvement [6, 20]. However, the inclusion of elements that directly address FA in CBT for pediatric anxiety is still limited. Recent findings in children from 4 to 7 years evidenced greater improvements in anxiety symptoms and FA after parent-led exposure intervention (addressing accommodations) compared to a treatment as usual (TAU) condition [20, 24]. Moreover, recent data suggest that interventions providing parents with guidance and training to decrease FA are associated with improved child outcomes. In this way, improvement of pediatric anxiety could be reached without child-inclusive interventions. The Supportive Parenting for Anxious Childhood Emotions program (SPACE) [25] is an innovative 10- to 12-week parent-based treatment program that is focused on reducing FA without child participation. It can be implemented alone or in conjunction with the child-centered intervention. Results from an open trial supported the feasibility, acceptability and preliminary efficacy of SPACE to improve anxiety and OCD in children [5]. Recently, in a large randomized controlled trial in children with anxiety disorders [26] this parent-based intervention demonstrated non-inferiority to child-centered CBT, with similar rates of response (87.5% vs. 75.5%) and remission (58.3% vs. 59.2%).

Associated Child and Family Factors

One of the more clinically relevant findings is the positive relationship between FA and anxiety symptom severity. Given that the evidence is mainly derived from cross-sectional data, is not possible to establish the direction of the causal link between FA and anxiety. However, the mentioned studies in which children's anxiety was reduced by manipulating parental accommodation [5, 26] reinforce the hypothesis that FA negatively affects pediatric anxiety. Regarding the magnitude of the association between FA and symptom severity, studies have obtained heterogeneous results, which vary from 0.03 to 0.74. It is possible that the observed range is due to other child and family-related variables that have been investigated in relation to accommodation.

Examining characteristics of children, no gender differences have been observed across studies [6, 18, 20, 23, 27] with one exception in which parents of girls were observed to exhibit more accommodation [18]. Relationships between

children's age and FA are not consistently observed. Some studies report no significant relationship between age and FA [16, 20, 23, 27] while others find significant associations with younger ages and FA [6, 19, 28]. FA appears to be the mechanism through which functional impairment [7, 8] is related to child anxiety severity. The presence of several anxiety disorders, separation anxiety [18], GAD, and specific phobia [19] predicted greater accommodation. Comorbidities such as internalizing and externalizing symptoms were related to increased accommodation behaviors [6, 7, 20]. Other psychological variables such as rage [20, 29] or anxiety sensitivity [28] also have a positive relationship with FA.

Recent research has also examined parent and family related variables that could impact the relationship of FA and anxiety. Among demographic variables (parent gender and age, marital status, and socio-economic/educational level), only age has shown a significant association with FA, as younger mothers exhibited higher levels of accommodation [27]. Parental psychopathology is observed to have an impact on FA and pediatric anxiety. Some studies have found positive associations between FA and maternal anxiety [27, 30], depression [15], and stress, although these results have not been replicated in fathers [21]. Finally, other aspects such as negative beliefs about anxiety and accommodation [23], experiential avoidance [31] and emotion regulation [30] also have demonstrated a positive relationship with FA.

Objectives for the Meta-analysis

Despite the importance of FA for the course, treatment and prognosis of anxiety in pediatric populations, there are no meta-analyses examining the association between FA and symptom severity. Given discrepancies in the literature, and the wide number of variables related with FA, the relationship between FA and anxiety severity could be moderated by potential factors, which, if addressed in treatment, would improve the efficacy of interventions for pediatric anxiety. In the case of OCD, the meta-analysis conducted by Wu et al. [32] including 41 studies, evidenced a moderate association between FA and symptom severity. This relationship was moderated by the number of items in the measure used to assess accommodation.

Following the PICOS strategy, the current meta-analysis intends to answer the following question: Is anxiety severity (Outcome) related to parental accommodation (Exposition factor) in children and adolescents (Participants) according to observational data (Designs)? There were two primary aims: (1) to examine the global magnitude of correlation between FA and anxiety symptom severity in children and adolescents, and (2) to investigate the existence of potential moderator variables related to youth, families, and methodology used in the studies.

We expected a positive association between FA and anxiety severity that could be moderated by several factors. Within child-related variables, some studies have found negative association between accommodation and child age [6, 19, 28]. This highlights the salience of accommodation in parents of younger children that may lead to stronger correlations between FA and anxiety. FA is more prominent in parents of children that suffer certain anxiety diagnoses such as separation anxiety disorder [18, 19]. Because separation anxiety requires parental involvement, the link between FA and anxiety may be stronger for separation anxiety relative to other anxiety disorders. Presence of comorbid internalizing and externalizing symptoms is related to FA [6, 7, 20]. Therefore, studies with greater percentages of children with non-anxiety comorbid disorders could report higher correlations between FA and anxiety severity. Regarding parent sociodemographic characteristics, one study reported heightened accommodation in younger mothers [27]. It is possible that lower parent mean age in the studies was related with stronger correlations. Finally, among methodological characteristics, different measures assess slightly different conceptualizations of accommodation (e.g., accommodation frequency vs. accommodation beliefs/scope). It is possible that these differences affect the strength of relations, which was observed in one meta-analysis for OCD [32].

Method

Meta-analysis protocol was registered in PROSPERO (registration number: CRD42019117248) and conducted following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) [33].

Study Selection Criteria

To be included in the meta-analysis, individual studies had to fulfill the predefined selection criteria: (a) include an objective measure of FA, (b) include an objective measure of pediatric anxiety severity, (c) participants were younger than 19 years, (d) sample size greater than ten participants, (e) all types of designs could be included so long as the studies reported statistical data needed to compute effect sizes, (f) due to limitations in the authors' translation abilities, studies should be written in English or Spanish, (g) published or unpublished studies conducted until 2018.

Search Procedures

An electronic search was conducted in *Medline*, *PsycInfo*, and *Psychology and Behavioral Sciences Collection*, including records until January 2019. English and Spanish keywords were combined as follows: (*family* OR *parental*)

accommodation AND *anxiety* AND (*child** OR *adolesc** OR *pediatric*). Names of relevant validated measures of FA in anxiety also were used as search terms. References of three previous systematic reviews [4, 34, 35] and of studies collected were also reviewed. Finally, seven authors who have wide scientific production on the topic were asked to send data from unpublished studies via email. PRISMA flow diagram summarizing the search process is in Fig. 1.

Electronic search yielded a total of 180 records (eliminating duplicates). After reading the title and abstract, 156 studies were discarded due to reasons listed in Fig. 1. Of the 24 articles whose full text was reviewed, 6 were discarded because: they did not include pediatric samples [36, 37], they did not include an objective anxiety measure [38, 39], the sample overlapped with another included study in the meta-analysis [40], or they described a case study [41]. The remaining 18 articles, reporting on 19 studies fulfilled selection criteria. Also included were one unpublished study (currently published) by Lebowitz et al. [26] and two raw data sets from Lebowitz, Marin, Martino and Silverman, and from Iniesta-Sepúlveda, Delage and Doria. In total, 22 studies were included in the analysis. The majority of these studies were conducted in the USA, with the exception of data from Iniesta-Sepúlveda et al. which were collected in Brazil.

Data Extraction

To examine the influence of moderator variables on the effect sizes, data about child, parent, and methodological variables were coded using a codebook developed a priori for this purpose by two independent investigators. Child-related variables extracted were: (a) gender (percentage of males); (b) children's mean age; (c) categorical age (whether the study included children, adolescents or both);

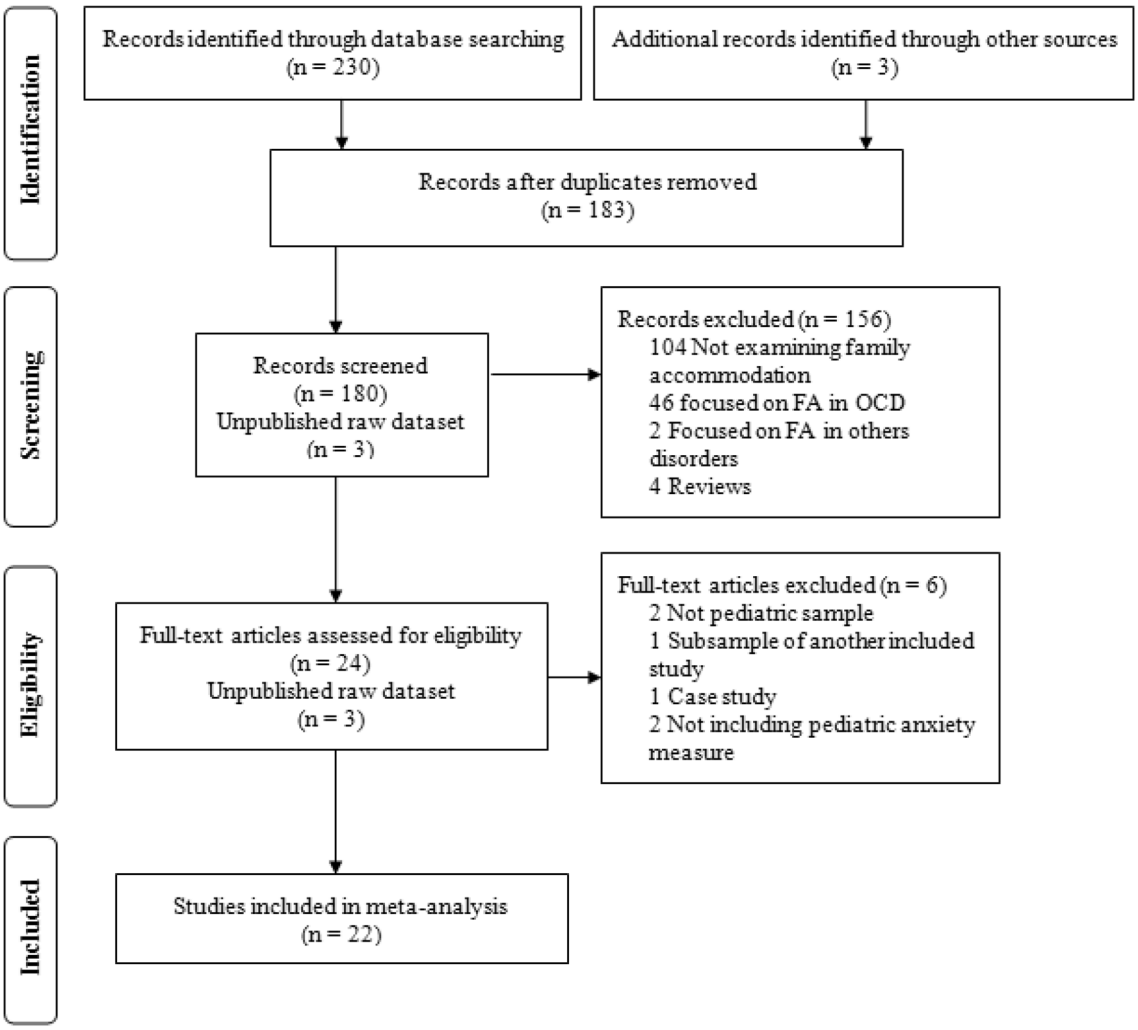

Fig. 1 PRISMA flow chart for search and study inclusion procedure

(d) percentage of Caucasians; (e) percentage of each primary anxiety diagnosis; (f) whether the study included children with OCD as a primary diagnosis; and (g) percentage of each non-anxiety comorbid disorder. Family-related moderators considered included: (a) mean parent age; (b) percentage of mothers participating; (c) percentage of parents married; and (d) median annual income. Methodological moderator variables were: (a) the type of sample (whether the study used clinical, community or mixed sample); (b) sample size; (c) the FA measure used to compute the effect size; (d) the type of FA measure (clinician-administered vs. self-report); (e) the dimension of FA assessed (frequency vs. other dimensions); (f) the anxiety measure used to compute the effect size; (g) the type of anxiety measure (clinician-administered vs. self-report); and (h) methodological quality (rated from 1 to 5, see risk of bias analysis in individual studies section). Results from the analysis of the reliability of codification process reflected satisfactory agreement for both categorical ($\kappa s = 0.75–1.00$) and continuous variables ($ICCs = 0.87–1.00$). Disagreements were resolved by consensus.

Risk of Bias Analysis in Individual Studies

Analyzing risk of bias within primary studies is necessary to ensure the validity of meta-analysis findings and is one of the preferred items in the PRISMA guideline. There is no established protocol for analyzing methodological quality in observational studies. Therefore, a methodological quality scale was created based on the STROBE Checklist for cross-sectional studies [42] and other tools proposed in literature [43]. The scale included the following four items: (a) whether the study used clear participant inclusion and exclusion criteria (1 yes, 0 no), (b) whether the sample was representative –use of probabilistic sampling in community studies, or multicentric samples in clinical studies– (1 yes, 0 no), (c) whether the study used a standardized anxiety measure validated in psychometric studies (1 yes, 0 no), (d) whether the study used a standardized FA measure validated in psychometric studies (1 yes, 0 no). Total methodological quality for each study was calculated as the sum of the four items and was included in moderator analyses.

Data Analysis

The Pearson correlation between FA and anxiety severity was used to characterize effect size. Several studies provided several correlation values (e.g., association between FA and various measures of anxiety severity). When possible, correlations computed with the FASA, were selected. When a study provided correlations between FA and several anxiety measures, clinician-administered version of *Pediatric Anxiety Rating Scale* (PARS) [44] was preferred given that this measure was used by the greatest number of studies. In three studies where correlations between FA and anxiety severity were not reported, they were solicited from the corresponding author. After collecting statistical information we decided to conduct separate meta-analyses for each informant of FA and anxiety measures. Primary outcomes include the effect size computed with FA and anxiety measures administered to parents. Additional meta-analyses were conducted with correlations between FA and anxiety measures administered to youth and correlations between FA and anxiety measures administered to different informants (in all cases, the FA measure was administered to parents and anxiety measure to children).

For statistical integration, Pearson correlations were transformed into Fisher's Z. After analysis, these values were converted back into the r metric, facilitating their interpretation. Magnitude of effect sizes was established according to Cohen's criteria [45]: small correlations from 0.10 to 0.29, moderate from 0.30 to 0.49, and large from 0.50 and above. Meta-analysis procedures were implemented assuming a random-effects model. Heterogeneity of the effect sizes was assessed using the Q statistic and the I^2index. The influence of moderator variables on the effect sizes was examined assuming a mixed-effects model. ANOVAs (Q_B) and meta-regressions (Q_R) were calculated for qualitative and continuous variables, respectively [46].

Several procedures were used to assess the publication bias, including the fail-*safe N index* [47], the Egger test, and the construction of a funnel plot and application of trim-and-fill' method [48]. All data were analyzed through Comprehensive Meta-Analysis (CMA 3.0) [49].

Results

Characteristics of Primary Studies

Main characteristics of the 22 studies as well as individual effect sizes are listed in Table 2 in Appendix. The total number of children and adolescents was 2353 with a mean age of 10.20 ($SD = 2.5$), being on average 50.12% males. Almost all studies included clinical samples with the exception of one study using a community sample [22] and three studies which recruited participants for both community and clinical contexts [22, 27, 31]. The percentage of mothers ranged from 67.8 to 100%. The mean parent age was 41.69 ($SD = 3.01$) years. The percentage of parents who were married ranged from 71 to 100%. The median of annual income varied from $6,120 (in the Brazilian sample) to $150,000

USD. FA measures utilized include the *FASA* in 13 studies, the Frequency subscale of the *PAS,* in 4 studies, the Scope subscale of the *FACLIS*, in 2 studies, the Accommodation and Beliefs subscale of the *PAKRS-PR*, in 2 studies, and the *PAS-Behavior* subscale in 1 study. In 20 studies, self-report measures were used to assess FA. The remaining 2 studies utilized clinician-administered FA measures. Informants were parents in 20 studies, and children in 6 studies. Anxiety measures used were the *PARS* in 8 studies, the *Screen for Child Anxiety Related Disorders– SCARED–* [50] in 6 studies, *Multidimensional Anxiety Scale for Children – MASC* or *MASC2–* [51] in 3 studies, the *Spence Children's Anxiety Scale – SCAS–* [52] in 3 studies, and the Anxiety subscale of *Child Behavior Checklist– CBCL–* [53] in 2 studies. Anxiety measures were self-reports in 14 studies, and clinician-administered in 8 studies. The informants were parents in 20 studies and children in 8 studies. Study methodological quality ranged from 2 to 4. Only five of the 22 studies obtained scores < 3. The mean methodological quality of all studies was 3.14 ($SD = 0.77$). Therefore, risk of bias for included studies was considered low.

Effect Size Distribution

Global index and individual effect sizes of each study for primary outcome (correlations computed with measures administered to parents) are showed in the Forest Plot in Fig. 2. The association between FA and anxiety severity yielded a global positive correlation of $r = 0.47$ (95% CI [0.39, 0.54] $z = 9.94$, $p < 0.001$). For individual studies, effect sizes varied from $r = 0.25$ to 0.77 reflecting positive associations in all cases. Twenty out of 22 studies reached statistical significance, with the exception of two studies [20, 54].

Meta-analysis of 6 studies reporting correlations computed with measures administered to children yielded a global effect size of $r = 0.27$ (95% CI [0.18, 0.35] $z = 5.97$, $p < 0.001$) which was statistically significant and reflected a positive and small association between FA and anxiety severity. Effect size of individual studies varied from $r = 0.19$ to 0.37 reflecting positive associations in all cases. All studies reached statistical significance with the exception of Iniesta-Sepúlveda et al. Meta-analysis of 4 studies reporting correlations between parent-rated FA and child-rated anxiety yielded a global effect size of $r = 0.10$ (95% CI [− 0.02, 0.23] $z = 1.60$, $p = 0.11$), which did not reach statistical significance and reflected a low association between FA and anxiety severity. Effect sizes of individual studies varied from $r = 0.03$ to 0.13 reflecting positive and non-significant associations in all cases.

Mean effect sizes were robust when compared to other statistical methods of averaging [e.g. 55]. Heterogeneity analysis was conducted with the 20 studies included in the meta-analysis of primary outcomes. Results evidenced the existence of considerable heterogeneity among study effect

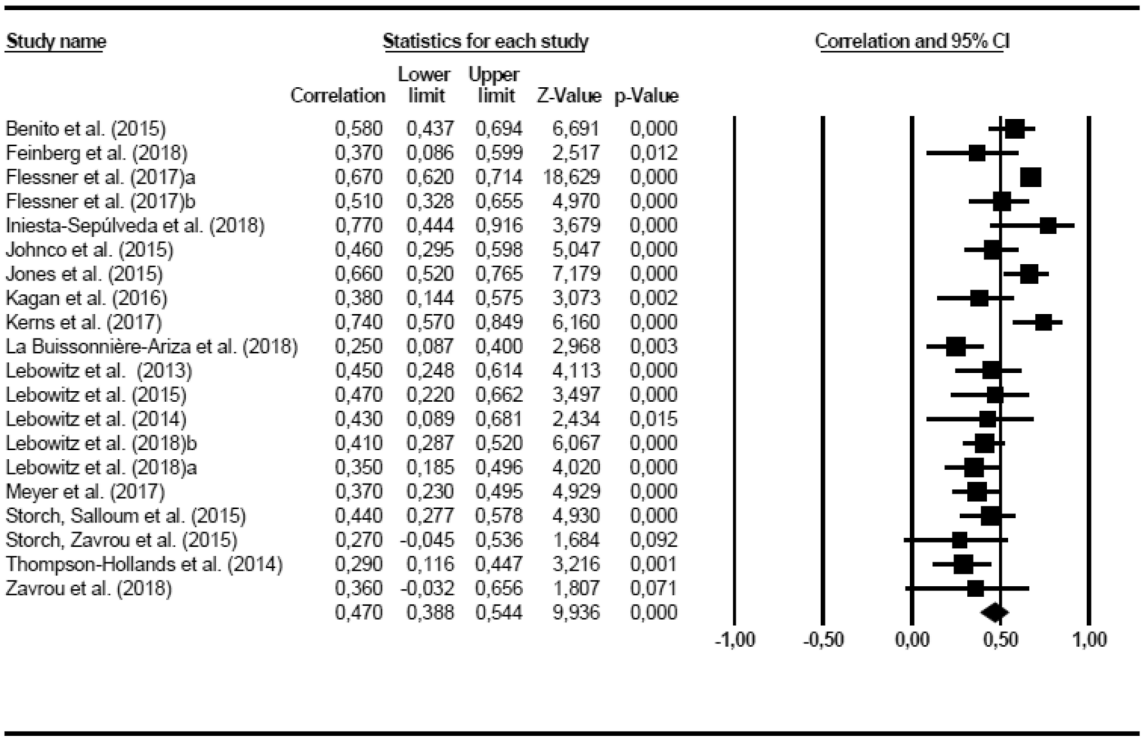

Fig. 2 Forest plot of the effect sizes in primary outcome

sizes [$Q(19) = 88.98$, $p < 0.001$; $I^2 = 78.65\%$], indicating that global index represents an estimation of the mean of parameters from diverse populations, and the pertinence of the analysis of moderator variables.

Analysis of Moderator Variables

Children-Related Factors

Studies did not show statistically significant differences among the included age groups ($Q[1] = 0.04$, $p = 0.835$). Effect sizes were significant for studies that included both children and adolescents ($k = 14$, $r = 0.47$, 95% CI [0.37, 0.56] $z = 8.12$, $p < 0.001$) and those that included only children ($k = 5$, $r = 0.49$, 95% CI [0.34, 0.61] $z = 1.60$, $p < 0.001$). Similarly, the mean age and percentage of males did not show any statistically significant association with the effect sizes (see Table 1 for continuous variables).

As Table 1 shows, the percentage of children with separation anxiety included in the study exhibited a statistically significant positive relationship with the effect sizes. Contrarily, a greater percentage of children with selective mutism was significantly related with lower effect sizes. None of the remaining primary anxiety diagnosis analyzed (GAD, social anxiety disorder, panic disorder, specific phobia, and unspecified anxiety disorder) showed significant effects (Table 1). Whether the study did ($k = 7$, $r = 0.48$, 95% CI [0.29, 0.63] $z = 4.60$, $p < 0.001$) or did not ($k = 8$, $r = 0.43$, 95% CI [0.37, 0.48] $z = 13.23$, $p < 0.001$) include youth with primary OCD, there was no significant influence on effect sizes ($Q[1] = 0.29$, $p = 0.58$). When non-anxiety comorbid disorders were examined, the percentage of children with OCD, depressive disorders, ADHD, conduct disorders, and PTSD did not significantly influence the effect sizes (Table 1).

Table 1 Results of the simple meta-regressions of the continuous variables on the effect sizes

	k	b_j	Q_R	Q_E
Children-related factors				
Mean age	19	−0.02	0.53	84.02**
Gender	18	0.00	0.08	74.27**
Percentage of Caucasians	17	−0.00	0.17	60.21**
Anxiety primary diagnosis				
% GAD	14	0.00	2.61	15.16
% social anxiety	14	0.00	1.00	17.82
% separation anxiety	14	.01	7.74*	11.48
% panic	14	−0.00	0.66	17.63
% selective mutism	13	−0.01	5.14*	8,83
% specific phobia	14	0.00	0.10	18.92
% unspecified anxiety disorder	14	−0.00	0.02	19.19
Non-anxiety comorbid disorder				
% OCD	11	0.00	0.14	47.17**
% depressive	11	−0.00	1.9	38.68**
% ADHD	10	0.00	0.02	6.92**
% conduct disorders	10	0.00	0.10	47.01**
% PTSD	11	−0.07	2.47	35.15**
Parent-related factors				
% mothers	16	−0.00	1.16	41.38**
Parent's mean age	8	−0.02	0.77	24.15**
% parents married	6	−0.00	0.17	18.91**
Annual income	8	−0.00	0.58	29.36**
Methodological factors				
Year	20	0.00	0.00	88.84**
Sample size [12–20, 23–27, 38, 51]	20	0.00	1.92	50.19**
Methodological quality [12–20, 23–27, 38, 51]	20	−0.06	−0.98	79.41**

k number of studies, b_j regression coefficient, Q_R statistic for testing the significance of the moderator variable, Q_E statistic for assessing the model misspecification, *GAD* generalized anxiety disorder, *OCD* obsessive–compulsive disorder, *ADHD* attention deficit hyperactivity disorder, *PTSD* posttraumatic stress disorder

*$p < .05$, **$p < .001$

Parent-Related Factors

Table 1 shows results for the analysis of the influence of parent-related variables on the effect sizes. There were no significant effects of mean parent age or percentage of mothers participating in the study. Neither the median annual income nor the percentage of parents married significantly influenced the relationship between FA and anxiety severity.

Methodological Factors

Among quantitative methodological moderators (sample size, publication year, and methodological quality) there was no significant association observed with effect sizes (Table 1). Regarding measurement characteristics, there were no significant differences ($Q[4] = 0.04$, $p = 0.84$) between FA measures assessing frequency ($k = 16$, $r = 0.46$, 95% CI [0.38, 0.53], $z = 10.87$, $p < 0.001$) and measures assessing other dimensions ($k = 4$, $r = 0.48$, 95% CI [0.24, 0.67], $z = 3.61$, $p < 0.001$). The anxiety scale used in the study did not significantly influence the effect sizes ($Q[4] = 4.75$, $p = 0.31$). Studies that used PARS obtained the largest correlations ($k = 8$, $r = 0.42$, 95% CI [0.36, 0.48], $z = 12.36$, $p < 0.001$) and CBCL anxiety the lowest ($k = 2$, $r = 0.40$, 95% CI [0.16, 0.59], $z = 3.20$, $p < 0.001$). The type of measure did not reach statistical significance for FA measures ($Q[1] = 0.01$, $p = 0.92$; clinician-administered: $k = 2$, $r = 0.46$, 95% CI [0.11, 0.70], $z = 2.57$, $p = 0.01$; self-report: $k = 18$, $r = 0.47$, 95% CI [0.38, 0.55], $z = 9.28$, $p < 0.001$), nor for anxiety measures ($Q[1] = 1.69$, $p = 0.19$; clinician-administered: $k = 8$, $r = 0.42$, 95% CI [0.36, 0.47], $z = 12.36$, $p < 0.001$; self-report: $k = 12$, $r = 0.51$, 95% CI [0.38, 0.61], $z = 7.09$, $p < 0.001$). The type of sample (clinical vs. community) and the FA scale used were not analyzed, since there were categories that consisted of only one study.

Analysis of Publication Bias

First, the *Fail-safe N* showed that the number of studies with null effect which must exist in order for the mean effect obtained in this meta-analysis to become non-significant was 2461. Second, the Egger test yield a non-significant result ($b_0 = -1.70$; $t[18] = 1.45$, $p = 0.16$) supporting the absence of publication bias. Third, to achieve symmetry in the funnel plot, trim and film method imputed two values (see Fig. 3). The adjusting mean effect including imputed values was $r = 0.49$ (95% CI: 0.41, 0.56), which is notably similar to the mean effect obtained with the 20 original values ($r = 0.47$; 95% CI: 0.39, 0.54). Finally, publication status was not related with effect sizes ($Q[1] = 0.09$, $p = 0.76$). These results allowed us to discard the presence of publication bias.

Discussion

This meta-analysis provides the global magnitude and significance of the relationship between FA and pediatric anxiety severity. Findings supported a positive moderate relationship which is similar to that observed in OCD ($r = 0.42$) [32]. However, when both FA and anxiety measures were administered to children, the mean correlation had a small but significant magnitude. Furthermore,

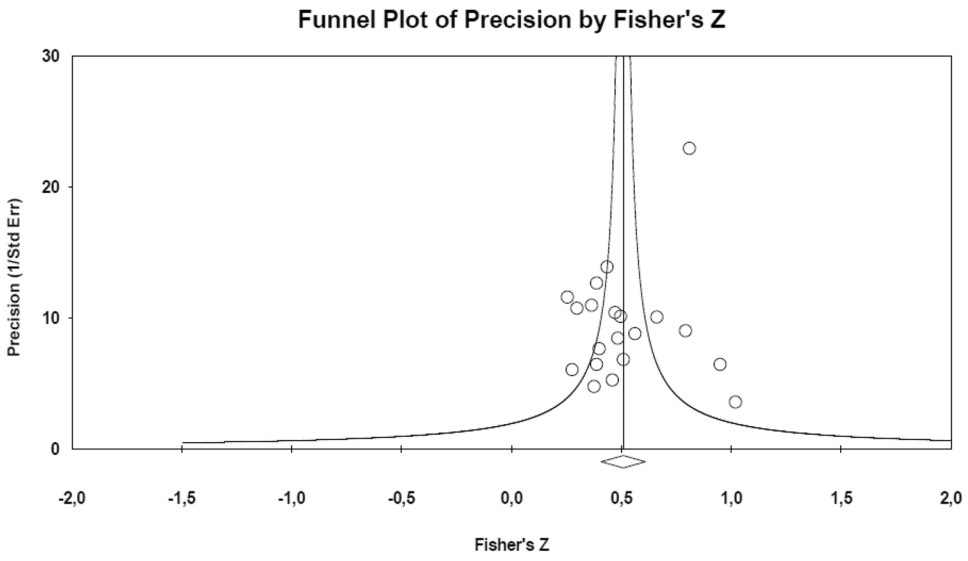

Fig. 3 Funnel plot of effect sizes in primary outcome

when correlations of individual studies were computed with FA measures administered to parents and anxiety measures administered to children, the mean effect was non-significant and weak. We speculate several possible explanations for these effects. Research has shown fairly weak child-parent agreement on pediatric anxiety measures [56–59]. Some studies demonstrated that children are better at predicting their anxious response to a fearful situation than parents [60, 61]. Given that anxiety symptoms are mostly internal and not easily observable by others, it is possible that parents are more aware about child's anxiety symptoms when they suppose greater distress or demand for them, as is the case of FA. The fact that FA was weakly or not related to child perceived anxiety may suggest that not all accommodation sought by the child is due to anxiety symptoms. Hamblin et al. [56] observed that FA predicted poor child-parent agreement in reporting separation anxiety and social phobia symptoms (parent endorsement and child non-endorsement). It is also possible that when parents reported high levels of accommodation, children reported lower levels of anxiety due to the role of accommodation relieving distress [62]. Finally, informant-related biases could exist when the same parent rates FA and child's anxiety, on the same day, with similar questionnaires. Parents may judge both variables with similar levels of severity yielding inflated correlations. Given the number of possible explanations, more in-depth studies on the relation between FA and anxiety in children are warranted.

Another objective of this meta-analysis was to identify potential moderators of the relationship between FA and anxiety severity. No child demographic variables moderated effect sizes. Despite the fact that age was associated with FA in some studies [6, 19, 28], the reduced variability of mean age among included studies made it difficult to establish an association. Among clinical variables, primary anxiety diagnosis influenced the mean effect, although the limited number of studies included in this analysis, and reduced regression coefficients observed suggest caution in interpreting these findings. As expected, studies including a greater percentage of children with separation anxiety were associated with increased correlations. This is consistent with studies where separation anxiety showed the strongest association with FA [18, 19]. It is not surprising that in separation anxiety more severe symptoms elicited more accommodation as parental involvement is inherent to the disorder. Selective mutism was inversely related with the effect sizes, which is counter to clinical experience indicating high levels of accommodation. To date, there are no studies that investigate the relationship between FA and selective mutism. It is possible that accommodation behaviors were underreported by parents or that the range of accommodations was limited to a few behaviors in this disorder (e.g., speaking by the child). None of the comorbid disorders analyzed moderated the correlation between FA and anxiety severity. This was unexpected given that presence of comorbidities was related to higher levels of accommodation [6, 20, 54]. In a previous meta-analysis, comorbidity neither was a significant moderator of the relationship of FA and OCD symptoms, concluding that comorbid disorders would not increase significantly the already existent level of accommodation [32]. Surprisingly, none of the investigated parent-related variables influenced the association between FA and anxiety severity. Regarding percentage of mothers, it is remarkable that ~ 80% of studies analyzed included > 90% of mothers, which challenges examination of mother-father differences. When examining methodological characteristics, scales that rated frequency of accommodation did not differ significantly from scales assessing other dimensions [e.g., number of accommodation behaviors, parent beliefs]. Contrarily, significant differences in correlations between FA and symptom severity depending on the version of accommodation scale have been previously observed for OCD [32].

Several limitations are noted. First, no studies provided longitudinal data, limiting the possibility of establishing causal links between FA and anxiety severity. Second, the number of studies limits the estimation of predictive power in moderator variable analysis. Third, while the majority of measures of FA are focused on frequency, some assessed different dimensions. This was the case of the FACLIS-Scope, which measures the total number of accommodation domains. Also, the PAKRS Accommodation and Beliefs includes items that describe parents' beliefs about children's anxiety symptoms. Fourth, language restrictions and excluding foreign databases limited the possibility of locating studies from other cultural backgrounds.

For future research, more studies using child reports of FA and anxiety severity are necessary to investigate predictors of children and parent discrepancies and facilitate analysis of moderator variables on correlations from child reports. Additionally, primary studies have reported

few family or parent characteristics. Some of these factors may have particular relevance, considering FA could be the mechanism through which these variables would be associated with severity, as is the case of maternal anxiety. The low number of fathers participating in the studies impedes an adequate analysis of gender influence. Interestingly, differences between mothers and fathers have been observed, mainly that psychopathological symptoms were related with accommodation in mothers but not in fathers [19]. It is possible that accommodation was experienced differently by fathers and mothers, or that accommodation relies mainly on maternal behaviors and routines. Finally, there are few studies on FA outside of the United States. This analysis only included one such study from a Brazilian population. By definition, accommodation is linked to family life, and therefore its relationship with symptom severity could be mediated by cultural factors (e.g., differences in the structure of parent–child relationships, family routines, etc.).

Findings from this meta-analysis suggest that FA is an important factor to consider in clinical practice for both assessment and treatment of pediatric anxiety. For assessment, high levels of accommodation could be indicative of severe anxiety symptoms and impairment. Observational assessments of accommodation could complement anxiety ratings, especially when informants are children. Additionally, separation anxiety symptoms should be screened when FA is present. Regarding treatment, these findings provide additional support for the important role of FA as a prognostic factor. In this sense, attenuated treatment response has been associated with FA [16] while parent training focused on reducing accommodation has demonstrated improvement [9, 26, 63].

Summary

This is the first meta-analysis on the relationship between FA and pediatric anxiety severity, examining potential child, family and methodological moderator variables. Separate meta-analyses were conducted for each informant of FA and anxiety measures. Global effect size from parent-report measures showed a positive moderate association between FA and anxiety severity. The type of anxiety disorder moderated this relationship. When correlations were computed with child-report measures, global effect sizes were small and also non-significant when anxiety was reported by children and FA by parents. Given these findings, the hypothesis of a causal link between accommodation and anxiety severity is gaining strength. Unanswered questions remain including the prospective interplay between FA and anxiety severity, fully powered moderator effects, and further establishing interventional approaches to address FA among an array of patient profiles including children with parents reluctant to withdraw accommodation, or children unwilling to engage in treatment.

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Compliance with Ethical Standards

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Appendix

See Table 2.

Table 2 Main characteristics and effects sizes for individual studies included in the meta-analysis

Study	Year	N	Age	Gender	Population	% Primary anxiety diagnosis	% Non-anxiety comorbid disorders	FA measure	MQ	Anxiety measure	ES
Benito et al. [17]	2015	105	9.29 ± 2.82	53.30	Clinical	GAD: 49.00, SAD: 10.60, SP: 3.80, Panic: .95, SEP: 30.80, UAD: 2.90	OCD: 7.62, depressive: 57.00, ADHD: 10.48, conduct: 9.52	PAS Frequency	4	PARS	0.58
Feinberg et al. [34]	2018	45	4.84 ± 1.71	–	Mixed	–	–	FACLIS Scope	2	SCAS	0.37
Flessner et al. [25]	2017a	531	11.20 ± 2.90	52.40	Community	–	OCD: 13.40, depressive: 7.00, ADHD: 21.80, conduct: 4.50, tic: 0.70	PAKRS-AB	3	SCAS	0.67
Flessner et al. [25]	2017b	81	11.90 ± 2.30	38.30	Clinical	GAD: 51.90, SAD: 33.30, SEP: 16.00	ADHD: 40.70, conduct: 17.30	PAKRS-AB	3	CBCL Anxiety	0.51
Iniesta-Sepúlveda et al	2018	16	11.44 ± 2.68	62.50	Clinical	GAD: 18.75, SAD: 43.50, SP: 12.50, Panic: 6.25, SEP: 18.75	–	FASA	3	SCARED	0.77 0.22[a]
Johnco et al. [32]	2015	106	9.82 ± 1.83	55.40	Clinical	GAD: 71.00, SAD: 45.80, SP: 31.80, Panic: 0.90, SEP: 41.10	OCD: 8.40, depressive: 43.90, ADHD: 12.10	PAS Frequency	4	PARS	0.46
Jones et al. [30]	2015	85	11.80 ± 3.11	43.50	Mixed	–	–	FASA	2	SCARED	0.66
Kagan et al. [18]	2016	62	10.48 ± 3.01	47.00	Clinical	GAD: 46.70, SAD: 25.81, SP: 14.52, SEP: 11.29, UAD: 1.61	–	FASA	2	MASC	0.38 0.11[b]
Kerns et al. [33]	2017	45	4.80 ± 1.70	–	Mixed	–		FASA	2	SCAS	0.74
La Buissonnière-Ariza et al. [7]	2018	138	14.40 ± 2.30	30.40	Clinical	GAD: 8.10, SAD: 8.10, SM: 3.70, Panic: 1.50, SEP: 7.40	Depressive: 28.70	FASA	4	SCARED	0.25 0.03[b]
Lebowitz et al. [20]	2013	75	10.65 ± 2.78	61.30	Clinical	GAD: 68.00, SAD: 22.00, SP: 38.00, Panic: 10.00, SEP: 38.00, UAD: 28.00	Depressive: 12.00, ADHD: 20.00, conduct: 24.00	FASA	4	SCARED	0.45
Lebowitz et al. [19]	2015	50	12.30 ± 2.90	35.00	Clinical	GAD: 34.00, SAD: 30.00, SP: 6.00, Panic: 6.00, SEP: 24.00	OCD: 12.00, depressive: 32.00, ADHD: 16.00, conduct: 8.00	FASA	3	MASC	0.47 0.28[a] 0.09[b]
Lebowitz et al. [16]	2014	31	11.13 ± 2.20	51.60	Clinical	GAD: 41.00, SAD: 12.00, SP: 16.00, SEP: 31.00	–	FASA	4	SCARED	0.43
Lebowitz et al. [63]	2017	98	10.35 ± 2.50	41.00	Clinical	GAD: 32.00, SAD: 19.00, SP: 12.00, Panic: 6.00, SEP: 31.00	OCD: 6.00, depressive: 18.00, ADHD: 15.00, conduct: 9.00	FASA	3	SCARED	0.37[a]
Lebowitz et al	2018	197	10.58 ± 3.07	48.50	Clinical	GAD: 35.10, SAD: 31.10, SP: 9.30, SM: 3.20, Panic: 3.30, SEP: 19.90	OCD: 15.50, depressive: 13.00, ADHD: 23.50, PTSD: 1.10	FASA	4	PARS	0.41 0.32[a]
Lebowitz et al. [29]	2019	124	9.60 ± 2.45	47.00	Clinical	GAD: 35.20, SAD: 34.80, SP: 11.80, SM: 2.50, SEP: 18.20	OCD: 13.90, depressive: 8.20, ADHD: 18.00, PTSD: 1.60	FASA	4	PARS	0.35 0.19[a]

Table 2 (continued)

Study	Year	N	Age	Gender	Population	% Primary anxiety diagnosis	% Non-anxiety comorbid disorders	FA measure	MQ	Anxiety measure	ES
Meyer et al. [26]	2017	164	12.30 ± 2.90	41.60	Clinical	–	OCD: 26.60, depressive: 17.20	PAS-behavior	4	PARS	0.37
Schleider et al. [31]	2017	103	11.07 ± 3.12	–	Clinical	GAD: 34.00, SAD: 30.00, SP: 11.00, Panic: 4.00, SEP: 19.00	OCD: 13.00, depressive: 32.00, ADHD: 18.00	FASA	3	MASC	0.33[a] 0.13[b]
Storch, Salloum et al. [8]	2015	112	9.87 ± 1.85	55.40	Clinical	GAD: 39.30, SAD: 24.10, SP: 8.00, SEP: 23.20	OCD: 8.00, depressive: 6.30, ADHD: 42.90, PTSD: 2.70	PAS Frequency	3	PARS	0.44
Storch, Zavrou et al. [57]	2015	40	–	82.50	Clinical	–	–	PAS Frequency	3	PARS	0.27
Thompson-Hollands et al. [21]	2014	119	11.04 ± 2.83	48.00	Clinical	GAD: 45.07, SAD: 18.31, SP: 9.86, SM: 19.72, Panic: 11.27, SEP: 9.86	PTSD: .82	FACLIS Scope	2	CBCL Anxiety	0.29
Zavrou et al. [22]	2018	26	5.38 ± 1.13	57.69	Clinical	GAD: 11.50, SAD: 23.00, SP: 15.30, SM: 11.50, SEP: 15.30, UAD: 3.80	–	FASA	3	PARS	0.36

N sample size, *MQ* methodological quality score, *ES* effect size, *GAD* generalized anxiety disorder, *SAD* social anxiety disorder, *SP* specific phobia. SEP: separation anxiety disorder, *SM* selective mutism, *UAD* unspecified anxiety disorder, *OCD* obsessive–compulsive disorder, *ADHD* attention deficit hyperactivity disorder, *PTSD* posttraumatic stress disorder

[a]Correlations computed with measures administered to children

[b]Correlations computed with FA measures administered to parents and anxiety measures administered to children

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