Review

Psikiyatride Güncel Yaklaşımlar-Current Approaches in Psychiatry 2026; 18(3):1175-1192

doi: 10.18863/pgy.1747016

Parenting Factors and Metacognitive Beliefs: A Systematic Review

Ebeveynlik Faktörleri ve Üstbilişsel İnançlar: Sistematik Bir Gözden Geçirme

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ABSTRACT

The aim of this study is to systematically review the literature examining the relationships between parenting factors and metacognitive beliefs. To this end, articles that examined the relationship between parenting factors and metacognitive beliefs were searched in the Medline, PubMed, Science Direct, Scopus, Web of Science, TR Index, Turkish Psychiatry Index, and ULAKBİM databases using the relevant keywords and their Turkish equivalents. This review, according to PRISMA decision criteria, included 19 quantitative studies, two of which were longitudinal and the others cross-sectional. In this systematic review, it was found that the parenting factor most frequently associated with metacognition was attachment patterns. The findings suggest that insecure attachment may foster negative metacognitive beliefs, which in turn may contribute to various psychological problems. Anxious attachment patterns were associated with hyperactivation, while avoidant attachment was associated with deactivation strategies, and it was suggested that both strategies could trigger sustaining mechanisms such as cognitive attention syndrome. In this context, parental attitudes may play a role in shaping individual cognitive styles not only through direct modeling but also through indirect effects. Although most of the studies included in the review were cross-sectional, they provide strong evidence for the relationship between attachment and parenting styles and metacognition. These findings indicate that parental factors play an important role in the development of metacognitive beliefs. A better understanding of this relationship may contribute to both the enrichment of current metacognitive intervention approaches and the development of preventive and supportive interventions targeting parental factors.

Keywords: Parenting factors, metacognitive beliefs, attachment patterns, parenting style

ÖZ

Bu çalışmanın amacı, ebeveynlik faktörleri ile üstbilişsel inançlar arasındaki ilişkileri inceleyen alanyazın çalışmalarını sistematik olarak gözden geçirmektir. Bu amaçla ebeveynlik faktörleri ile üstbilişsel inançlar arasındaki ilişkiyi incelemiş olan makaleler belirlenen anahtar kelimeler ve İngilizce karşılıkları kullanılarak Medline, PubMed, Science Direct, Scopus, Web of Science, TR Dizin, Türk Psikiyatri Dizini ve ULAKBİM veri tabanlarında taranmıştır. Bu incelemeye PRISMA karar kriterine uygun ikisi boylamsal, diğerleri kesitsel olmak üzere 19 niceliksel çalışma dâhil edilmiştir. Bu sistematik incelemede, üstbilişlerle en sık ilişkilendirilen ebeveynlik unsurunun bağlanma örüntüleri olduğu görülmüştür. Bulgular, özellikle güvensiz bağlanmanın olumsuz üstbilişsel inançları besleyebileceğini ve bunun da çeşitli psikolojik sorunları teşvik edebileceğini göstermektedir. Kaygılı bağlanma örüntüsü hiperaktivasyon; kaçıngan bağlanma ise deaktivasyon stratejileriyle ilişkilendirilmiş, her iki stratejinin de bilişsel dikkat sendromu gibi sürdürücü mekanizmaları tetikleyebileceği öne sürülmüştür. Bu bağlamda, ebeveyn tutumları yalnızca doğrudan modelleme yoluyla değil, dolaylı etkiler aracılığıyla da bireysel bilişsel stillerin şekillenmesinde rol oynayabilir. İncelemeye dâhil edilen çalışmaların çoğunluğu kesitsel olsa da özellikle bağlanma ve ebeveynlik stillerinin üstbilişlerle ilişkisine dair güçlü kanıtlar sunmaktadır. Bu bulgular, ebeveyn faktörlerinin üstbilişsel inançların gelişiminde önemli bir rol oynadığını göstermektedir. Bu ilişkinin daha iyi anlaşılmasının, hem mevcut üstbilişsel müdahale yaklaşımlarının zenginleştirilmesine hem de ebeveyn faktörlerini hedefleyen önleyici ve destekleyici müdahalelerin geliştirilmesine katkı sağlayabileceği düşünülmektedir.

Anahtar sözcükler: Ebeveynlik faktörleri, üstbilişsel inançlar, bağlanma örüntüsü, ebeveynlik stili

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Received: 21.07.2025 | **Accepted:** 21.12.2025

Introduction

Metacognition was first introduced by Flavell (1979), who defined it as knowledge of, or cognitive activity concerning, the various aspects of cognitive functioning (Flavell et al. 1993). Flavell's attempt to conceptualize metacognition was subsequently expanded by later researchers (Scheider 2008). Wells (2021), who has conducted major theoretical work on metacognition, conceptualizes it as a person's cognitions about their own cognitions, internal states, and coping strategies. Wells and Matthews (1996) explain metacognition within the framework of the Self-Regulatory Executive Function (S-REF) model. The model emphasizes that psychological problems arise through the activation of a specific thinking style. This thinking tendency is termed the Cognitive Attentional Syndrome (CAS), which includes worry, rumination, perseverative negative beliefs, threat monitoring, mental control, and avoidance. Metacognitive belief domains are thought to provide the conditions that give rise to CAS; thus, these two constructs are considered interconnected (Wells and Matthews 1996). A closer examination of metacognitive belief domains shows that positive metacognitive beliefs concern the value of prolonged thinking (Wells 2021). In other words, positive metacognitive beliefs refer to beliefs about the usefulness of worrying, focusing on threats, or attempting to control thoughts such as rumination. For example, the statement "Worrying helps me prepare for dangers" illustrates this type of belief. In contrast, negative metacognitive beliefs involve beliefs about the uncontrollability and danger of thoughts, as well as the importance and meaning attributed to thoughts (Wells 2021, Fisher and Wells 2022). More specifically, negative metacognitive beliefs encompass beliefs about the uncontrollability and danger of worry (e.g. "I won't be able to stop worrying"), low cognitive confidence (e.g. "My memory misleads me"), the need to control thoughts (e.g. "If I cannot control my thoughts, it means I am weak"), and cognitive self-consciousness (e.g. "I pay close attention to how my mind works") (Wells 2021). Maladaptive metacognitive beliefs trigger CAS, thereby inhibiting the initiation of healthy self-regulation (Wells 2021). The literature demonstrates that metacognitive beliefs are associated with psychopathologies, and psychological health-related variables such as health anxiety (Keen et al. 2022), schizophrenia (Nassabeh et al. 2021), anxiety, depression, and quality of life (Lenzo et al. 2020). These findings suggest that metacognitive beliefs are a transdiagnostic construct (Sun et al. 2017). Within this framework, the question of which factors shape metacognitive beliefs becomes increasingly important. To address this question, it is first necessary to examine how metacognitions develop.

From a developmental perspective, the development and maturation of metacognitive skills extends from early preschool years through adolescence and late childhood (Scheider 2008). Although research has produced differing findings regarding the development of metacognition, studies have shown that metacognitive abilities may begin to emerge as early as two months (Brinck and Liljenfors 2013), that certain forms of metacognitive monitoring appear around ages 2–2.5 (Lyons and Ghetti 2011), that between ages 3–5 they guide thoughts and behavior through past experiences (Whitebread et al. 2007), and that by ages 5–7.5 children reach a level at which they can observe their own cognitive performance (Chernokova 2014). In contrast to these studies emphasizing early childhood, other research suggests that metacognitive skills may emerge later, such as between ages 8–10 (Veenman et al. 2004) or even between ages 11–17 (Weil et al. 2013). Collectively, these studies indicate that the precise developmental timeline of metacognition remains uncertain, yet childhood appears to be a critical developmental period.

The relevant literature suggests that a child's social-cognitive development cannot be considered independent of close family interactions (Sharp and Fonagy 2008) and that parental attitudes and behaviors have a significant impact on the child's psychosocial adjustment (Gottman et al. 1996). Research on cognitive development also supports this view. Early experiences with primary caregivers are proposed to influence children's later life, their attachment patterns, and their metacognitive knowledge (Main 1991). The familial climate in which children grow up can shape not only their emotional and cognitive development but also the coping strategies they adopt, their attachment patterns, and the ways in which they interpret and respond to situations. It has been suggested that learning acquired through parental modeling may be maintained through parents' reinforcing behaviors (Barrett et al. 1996). Parents are considered to have a primary influence on the child's developmental environment (Gallagher and Cartwright-Hatton 2008). This influence is also reflected in individuals' attachment patterns; in turn,

attachment patterns may shape the coping strategies a person employs, thereby providing a foundation for the development of metacognitive beliefs. In anxious attachment, hyperactivation strategies predominate (Main 1990); individuals perceive threats as greater than they actually are, evaluate their coping abilities negatively, and consequently experience heightened needs for closeness and approval (Mikulincer and Shaver 2016). In avoidant attachment, the strategy is termed deactivation (Main 1990); individuals suppress or push away negative thoughts and feelings from their awareness (Mikulincer and Shaver 2016). These strategies function as coping mechanisms aimed at preventing the pain and disappointment that may arise in close relationships (Turliuc et al. 2024).

In this context, the role parents play in a child's development encompasses not only attachment strategies but also, in a broader sense, parenting behaviors. Parenting is a comprehensive process involving behaviors that shape a child's life and emotional climate across different developmental periods (Darling and Steinberg 1993). The parenting behaviors exhibited throughout this process emerge as a factor that can significantly influence the development of the child's metacognitive beliefs. Parenting is defined as the entirety of parents' attitudes, behaviors, and emotional expressions toward the child. This definition includes not only intentional behaviors aimed at childrearing but also unintentional behaviors such as tone of voice, gestures, and emotional responses (Darling and Steinberg 1993). At this point, the integrative model of Darling and Steinberg (1993) offers a theoretical basis for understanding why different variables related to parenting should be examined together. According to the model, children's psychological and behavioral characteristics are shaped by the joint influence of parental practices exhibited in specific situations and the broader, enduring parenting style in which these practices are embedded. Thus, parenting styles, attitudes, practices, behaviors, and elements such as acceptance–rejection are considered complementary components within the framework of social development. Because parenting plays a multidimensional and determining role in children's cognitive and emotional development (Belsky 1984), the present study adopts a broad conceptualization of parenting factors. Although research on metacognitive beliefs and parenting factors exists (e.g. Myers and Wells 2015, Chow and Lo 2017), to our knowledge, no systematic review has specifically examined parental factors associated with the development and origins of metacognitive beliefs. Considering the relationships revealed in the literature, examining the existing research findings on the association between parental factors and metacognitive beliefs may offer valuable contributions to the understanding of these factors and to the development of interventions targeting them. Accordingly, the aim of the present study is to systematically review quantitative studies examining the relationships between individuals' metacognitive beliefs and parenting factors across samples encompassing childhood, adolescence, and adulthood.

Method

The protocol for the present systematic review was registered in the National Institute for Health and Care Research (NIHR) International Prospective Register of Systematic Reviews (PROSPERO) under the registration number "CRD420251042370". Throughout the study process, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al. 2021) were followed.

Study Design and Data Sources

In this review, English and Turkish articles related to the topic of interest were searched in the Medline, PubMed, Science Direct, Scopus, Web of Science, TR Index, Turkish Psychiatry Index and ULAKBİM databases. The keywords used in the literature search were structured in accordance with the PICOS (Population, Intervention, Comparison, Outcomes, Study Type) framework (Thomas et al. 2019). The search strategy keywords are presented in Table1. The systematic review considered all individuals, children, adolescents, and adults, without age restrictions as the population; parenting factors (e.g. parental factors, parenting styles, parental rejection, parental acceptance, attachment patterns) as the exposure/intervention; metacognitive beliefs as the outcome variable; and quantitative studies as the study type. The determined keywords were combined using Boolean operators and the search was conducted accordingly. The results obtained from the literature search were transferred to the EndNoteWeb reference management software, and duplicated records were removed. Sources identified

through the search were evaluated based on inclusion and exclusion criteria. In addition, backward citation searching was conducted to identify eligible studies, and relevant articles were included in the review.

Table 1. Search terms and combinations used within the scope of metacognition and parental factors

	Search No	English Keywords	Turkish Keywords
Metacognition	#01	"metacognition" OR "metacognitive beliefs"	"üstbiliş" OR "üstbilişsel inançlar"
Parental Factors	#02	"parental factors" OR "parental influences"	"ebeveyn faktörleri" OR" ebeveyn etkileri"
	#03	"parental rejection" OR "parental acceptance"	"ebeveyn reddi" OR "ebeveyn kabulü"
	#04	"parental attitudes" OR "parenting styles"	"ebeveyn tutumları" OR "ebeveynlik stilleri"
	#05	"parental behaviors" OR "parental practices" OR "parenting"	"ebeveyn davranışları" OR "ebeveyn uygulamaları" OR "ebeveynlik"
	#06	"attachment style" OR "attachment pattern" OR "attachment"	"bağlanma stili" OR "bağlanma örüntüsü" OR "bağlanma"
Search Combinations	#07	#01 AND #02 / #01 AND #03 / #01 AND #04 / #01 AND #05 / #01 AND #06	

Inclusion and Exclusion Criteria

This section outlines the inclusion and exclusion criteria specified for the systematic review. Inclusion criteria consisted of quantitative studies that examined the relationship between parenting factors, such as parenting styles, parental attitudes, parental behaviors, parental practices, parental influences, parental rejection, and parental acceptance, and metacognitive beliefs; studies directly investigating the association between parenting factors and the metacognitive beliefs of individuals (children, adolescents or adults); studies that collected solely quantitative data and employed quantitative analysis methods; and studies published in English or Turkish.

Exclusion criteria included studies that addressed parenting factors but did not directly focus on metacognitive beliefs; studies examining parenting factors but focusing on cognitive development, intelligence, learning strategies, or metacognitive skills (e.g. monitoring, evaluating, and regulating thinking processes) without addressing metacognitive beliefs; studies examining parents' own metacognitive beliefs without directly addressing the relationship between parental attitudes, behaviors, or attachment characteristics and the metacognitive beliefs of children, adolescents, or adults; studies conducted using qualitative or mixed methods; publications not in full-text article format such as books, book chapters, theses, reports, and conference proceedings; and studies not published in English or Turkish.

Procedure

Only quantitative studies were included in the systematic review, and no restrictions were imposed regarding study design, allowing for both longitudinal and cross-sectional research. Additionally, no year limitations were applied in the search, and studies up to the year 2025 were evaluated. A narrative synthesis approach was used to combine the findings. The identification, screening, and selection processes of the systematic review were outlined in the PRISMA flow diagram (Moher et al. 2009), presented in Figure 1.

The literature search was conducted between April 2025 and May 2025. A total of 5785 records were identified, 5773 of which were retrieved from the specified databases and 12 through citation searching. Duplicate records from database sources were removed using EndNoteWeb. After removing duplicates, 4089 studies remained, and their titles and abstracts were screened; 3948 studies were excluded as they were deemed unrelated to the review topic. The remaining 141 articles were then examined in full text and assessed for eligibility. During the full-text review, a total of 122 studies were excluded: studies that addressed parenting but did not directly focus on metacognitive beliefs (n = 55), those focusing on metacognitive skills or cognitive development without addressing metacognitive beliefs (n = 35), studies examining only parents' metacognitive beliefs without considering the relationship with children (n = 15), publications not in article format (book, thesis, proceeding, etc.) (n = 15), and studies excluded due to

language (n = 2). The screening process was conducted by the first author, and the results were checked by the second author; inclusion and exclusion decisions were jointly evaluated to minimize potential errors or bias. Ultimately, 19 articles were deemed eligible and included in the systematic review. Details regarding the included studies are presented in Table 2.

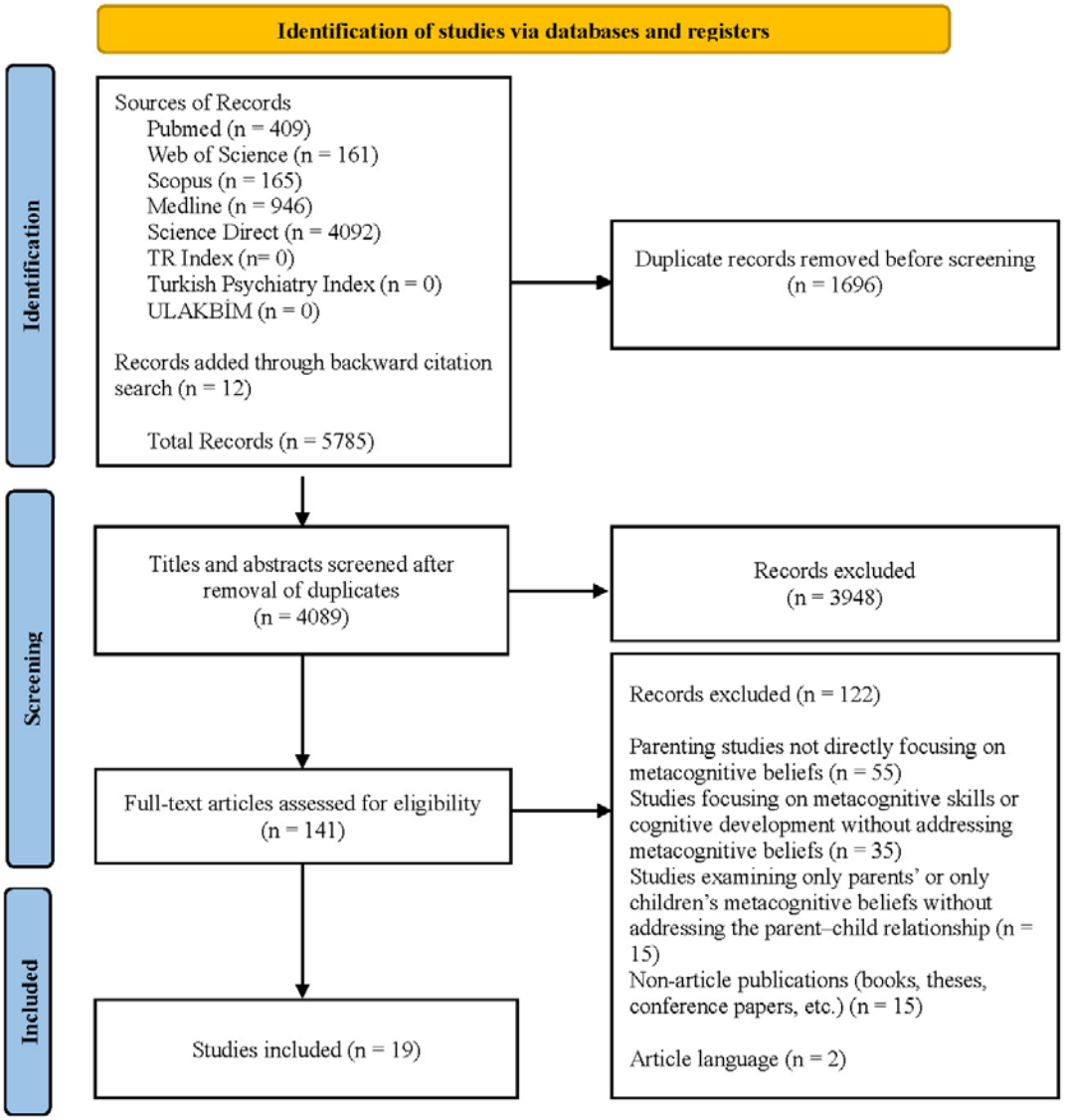

Figure 1. PRISMA flow chart

Quality Assessment

The cross-sectional studies included in the review were evaluated using the Appraisal Tool for Cross-Sectional Studies (AXIS) (Downes et al. 2016), which assesses studies across 20 criteria, including introduction, method, results, ethical approval, and conflict of interest. For the two longitudinal studies, the Newcastle–Ottawa Quality Assessment Scale (NOS) (Wells et al. 2013) was used. The NOS evaluates studies across three domains, selection of study groups, comparability of groups, and assessment of outcomes, using a star-based rating system ranging from 0 to 9. Studies receiving 3–4 stars in selection, 1–2 stars in comparability, and 2–3 stars in outcomes were classified as high quality; those with 2 stars in selection, 1–2 stars in comparability, and 2–3 stars in outcomes were considered moderate quality; and those with 0–1 star in selection, 0 stars in comparability, or 0–1 star in outcomes were classified as low quality.

Table 2. Characteristics and main findings of the ıncluded studies

Reference	Design	Sample	Parenting Factor; Measurement	Measurement of Metacognitive Beliefs	Main Findings
Akkuş and Yılmaz 2021	Quantitative, Cross-sectional	Adults with BMI ≥ 30 (n = 184)	Attachment; ECR-R	Metacognitive beliefs; MCQ-30	Anxious attachment was found to have an indirect effect through negative metacognitive beliefs about worry in its association with depressive and anxiety symptoms. However, no similar effect was observed for avoidant attachment.
Anyan et al. 2020	Quantitative, Longitudinal	University students (n = 241)	Social and emotional loneliness (Family loneliness subscale); SELSA-S	Metacognitive beliefs; MCQ-30	Concurrent and prospective correlations indicated moderate, positive, and significant associations between familial loneliness and metacognitive beliefs. However, in the SEM analysis, no significant indirect pathway was identified between familial loneliness and metacognitive beliefs..
Benedetto et al. 2018	Quantitative, Cross-sectional	Students aged 13–18 (n = 191)	Parental emotional availability; LEAP Psychological control; PCS-YSR Perceived parenting; POPS	Metacognitive beliefs (for children); MCQ-C	In the context of parenting attitudes, factors such as emotional availability, psychological control, and parental perception were shown to be significantly associated with metacognitive beliefs.
Brosnan et al. 2020	Quantitative, Cross-sectional	Adults using cannabis (n = 85)	Parenting styles; PSDQ	Metacognitive beliefs; MCQ-30	Negative metacognitive beliefs were found to be associated with permissive, verbally hostile, and irrationally punitive parenting attitudes; beliefs concerning the need to control thoughts were associated with physical coercion and irrationally punitive parenting attitudes; and cognitive awareness was associated with parental verbal hostility.
Chow and Lo 2017	Quantitative, Cross-sectional	Parent–adolescent dyads (n = 85)	Parental involvement and negativity; 5-minute parent–adolescent interaction (Tangram task)	Positive and negative metacognitive beliefs about rumination; PBRS ve NBRS	A positive and significant association was found between parental negativity (i.e., rejection) and adolescents' positive metacognitive beliefs. Additionally, a marginally significant association was detected between parental involvement (or control) and adolescents' negative metacognitive beliefs.
Demirdöğen et al. 2021	Quantitative, Cross-sectional	Middle school students (n = 559)	Attachment quality; s-IPPA	Metacognitive beliefs (for children); MCQ-C	A partial mediating effect of metacognitive problems was identified in the relationship between the quality of maternal and paternal attachment and depressive symptoms.
Donovan et al. 2017	Quantitative, Cross-sectional	Children aged 8–12 and their parents (n = 114)	Parental anxiety; PSWQ	Metacognitive beliefs (for children); MCQ-C	Children's negative metacognitive beliefs and cognitive avoidance were found to mediate the relationship between parental anxiety and child anxiety.
Efrati and Spada 2023	Quantitative, Longitudinal	Adolescents aged 13–18 (n = 1056)	Attachment style; ASQQ	Metacognitive beliefs about online gaming; MOGS	Metacognitive beliefs about online gaming mediated the association between attachment patterns and internet gaming disorder.
Gallagher and Cartwright-Hatton 2008	Quantitative, Cross-sectional	Adolescents aged 16–18 (n = 168)	Attachment; PBI Child-rearing style; the Parenting Scale Recollections of upbringing; EMBU-s	Metacognitive beliefs; MCQ-30	Metacognitive beliefs partially mediated the association between parental overreactivity and trait anxiety.

Table 2. Characteristics and main findings of the ıncluded studies

Reference	Design	Sample	Parenting Factor; Measurement	Measurement of Metacognitive Beliefs	Main Findings
Lønfeldt et al. 2017a	Quantitative, Cross-sectional	Parent–child dyads (n = 188)	Parental overinvolvement; Tangram task Controlling parenting	Metacognitive beliefs (for children); MCQ-C30	Maternal controlling parenting behaviors and anxious beliefs regarding the child were weakly but significantly associated with children's metacognitive beliefs—specifically beliefs related to the need to control thoughts. However, these parenting factors did not mediate the similarity between maternal and child metacognitions.
Lønfeldt et al. 2017b	Quantitative, Cross-sectional	Adolescents aged 9–17 (n = 1062)	Maternal psychological and behavioral control; CRPBI	Metacognitive beliefs (for children); MCQ-C30	The mediating role of children's metacognitive beliefs in the relationship between maternal psychological control and child anxiety was tested using SEM. Analyses revealed that the mediating role of metacognitive beliefs was significant.
Marci et al. 2021	Quantitative, Cross-sectional	Early adolescents (n = 538)	Attachment; ECR-RC	Metacognitive beliefs (for children); MCQ-C	The SEM model examining the relationship between attachment patterns and problematic internet use in early adolescence, and the mediating role of negative metacognitive beliefs about worry, indicated that negative metacognitive beliefs significantly mediated the associations between both anxious and avoidant attachment styles and problematic internet use.
Marino et al. 2019	Quantitative, Cross-sectional	Students aged 14–20 (n = 369)	Bağlanma kalitesi; IPPA	Metacognitive beliefs; MCQ-30	Analyses revealed that alienation from mother and father, as well as communication with father, significantly predicted children's metacognitive beliefs. Additionally, metacognitions were shown to mediate the relationship between alienation from mother and father and problematic internet use (PIU), as well as the relationship between communication with father and PIU.
		Students aged 14–20 (n = 442)	Attachment; ECR-RC	Metacognitive beliefs; MCQ-30	Attachment anxiety toward both mother and father, as well as maternal avoidant attachment, significantly predicted children's metacognitive beliefs. Furthermore, the findings indicated that metacognitive beliefs mediated the associations between both maternal avoidant attachment and paternal anxious attachment and problematic internet use.
Myers and Wells 2015	Quantitative, Cross-sectional	University students and adults (n = 350)	Attachment; RSQ	Metacognitive beliefs; MCQ-30	Attachment anxiety was significantly associated with all subdimensions of metacognitive beliefs except positive metacognitive beliefs about worry. In the relationship between emotional abuse and anxious attachment, the mediating role of negative metacognitive beliefs about worry was tested using SEM, and the mediating effect of metacognitive beliefs was demonstrated.

Table 2. Characteristics and main findings of the ıncluded studies

Reference	Design	Sample	Parenting Factor; Measurement	Measurement of Metacognitive Beliefs	Main Findings
Nordahl et al. 2021	Quantitative, Cross-sectional	University students (n = 296)	Attachment; MAQ	Metacognitive beliefs; MCQ-30	Positive and negative metacognitive beliefs and cognitive confidence were positively and significantly associated with avoidant, ambivalence-worry and ambivalence-merger attachment styles. Beliefs concerning the need to control thoughts were associated with ambivalence-worry and ambivalence-merger attachment, whereas cognitive self-consciousness was significantly associated only with ambivalence-worry attachment.
Spada et al. 2012	Quantitative, Cross-sectional	Adults (n = 327)	Attachment; PBI	Metacognitive beliefs; MCQ-30	Analyses revealed a significant association between parental overprotection and both the need to control thoughts and negative metacognitive beliefs.
Turliuc et al. 2024	Quantitative, Cross-sectional	Adults (n = 447)	Attachment; ECR-R	Metacognitive beliefs related to smoking; MSQ	Findings indicated that both negative and positive metacognitive beliefs about smoking played a significant mediating role in the relationship between anxious attachment and nicotine dependence.
Yavuz et al. 2019	Quantitative, Cross-sectional	Adolescents aged 14–17 (n = 1025)	Attachment; s-IPPA	Metacognitive beliefs (for children); MCQ-C	The mediating role of metacognitive beliefs in the relationship between adolescents' attachment quality to their parents and somatization symptoms was tested using SEM. The results showed that metacognitive beliefs partially mediated this relationship.
Williams et al. 2016	Quantitative, Cross-sectional	Women who had given birth within the past 12 months (n = 502)	Attachment; PBI	Metacognitive beliefs; MCQ-30	The study findings indicated that metacognitive beliefs fully mediated the association between past parenting experiences and postpartum depression and trauma symptoms.

ASQQ: Attachment Style Classification Questionnaire; BMI: Body Mass Index; CRPBI: Child's Report of Parent Behavior Inventory; ECR-R: Experiences in Close Relationships Inventory–Revised Scale; ECR-RC: Short form of the Experiences in Close Relationships Scale–Revised, Child version; EMBU-s: the short form of the Egna Minnen Beträffande Uppfostran Questionnaire; IPPA: the Inventory of Parent and Peer Attachment; LEAP: Lum Emotional Availability of Parents Scale; MAQ: Measure of Attachment Qualities; MCQ-30: Metacognitions Questionnaire-30; MCQ-C: Metacognitions Questionnaire for Children; MCQ-C30: Metacognitions Questionnaire for Children-30; MOGS: The Metacognitions about Online Gaming Scale; MSQ: the Metacognitions about Smoking Questionnaire; NBRS: the Negative Beliefs about Rumination Scale; PBI: the Parental Bonding Instrument; PBRS: the Positive Beliefs about Rumination Scale; PCS-YSR: the Psychological Control Scale-Youth Self-Report; PIK: Problemli İnternet Kullanımı; POPS: the Perceptions of Parent Scale; PSDQ: the Parenting Styles and Dimensions Questionnaire-Short Form; PSWQ: the Penn State Worry Questionnaire; RSQ: the Relationship Scales Questionnaire; SEM; Structural Equation Modeling; SELSA-S: the Social and Emotional Loneliness Scale for Adults-Short form; s-IPPA: the Inventory of Parent and Peer Attachment-Short Form

Results

Methodological and Sample Characteristics of the Studies

All studies included in the present systematic review employed quantitative designs. Only two studies utilized a longitudinal design (Anyan et al. 2020, Efrati and Spada, 2023), whereas all remaining studies were cross-sectional.

Participant ages ranged from 7 (Lønfeldt et al. 2017a, Lønfeldt et al. 2017b) to 76 years (Brosnan et al. 2020). In several studies (Gallagher and Cartwright-Hatton, 2008, Lønfeldt et al. 2017b, Benedetto et al. 2018, Marino et al. 2019, Yavuz et al. 2019), the majority of participants were students and adolescents aged 8-20 years. In addition, a number of studies included adult samples (Spada et al. 2012, Turliuc et al. 2024). Some studies involved university students (Myers and Wells 2015, Anyan et al. 2020, Nordahl et al. 2021), adults

with a body mass index of 30 or above (Akkuş and Yılmaz 2021), individuals using cannabis (Brosnan et al. 2020), parent-child dyads (Donovan et al. 2017, Lønfeldt et al. 2017a), parent–adolescent dyads (Chow and Lo 2017), and women in the postpartum period (Williams et al. 2016). Moreover, some studies focused on age-specific subgroups such as middle school students (Demirdöğen et al. 2021) and early adolescents (Marci et al. 2021).

Measurement Methods Used in the Studies

Five different instruments were identified in the measurement of metacognitive beliefs, one of the two primary variables examined. Across studies, the most frequently used measures were the Metacognitions Questionnaire-30 (MCQ-30; Wells and Cartwright-Hatton 2004, MCQ-30 TR; Yılmaz et al. 2008), the Metacognitions Questionnaire for Children (MCQ-C; Bacow et al. 2009, ÜBO-ÇE; Irak 2012), and the Metacognitions Questionnaire for Children-30 (MCQ-C30; Esbjørn et al. 2013). Beyond these commonly used instruments, one study (Chow and Lo 2017) employed the Positive Beliefs about Rumination Scale (PBRS; Papageorgiou and Wells 2001a, RUMİ-olumlu; Yılmaz et al. 2015) and the Negative Beliefs about Rumination Scale (NBRS; Papageorgiou and Wells 2001b, RUMİ-olumsuz; Yılmaz et al. 2015). Another study (Turliuc et al. 2024) used the Metacognitions about Smoking Questionnaire (MSQ; Nikčević et al. 2015), and one study (Efrati and Spada 2023) used the Metacognitions about Online Gaming Scale (MOGS; Spada and Caselli 2017, MOGS-T; Nazlıgül and Süsen, 2021).

The other primary variable examined was parenting factors, which were assessed in a variety of ways. Within the studies included in the systematic review, parenting factors encompassed attachment, familial loneliness, parental anxiety, parental psychological and behavioral control, parenting style, memories of upbringing, parental emotional availability, and parental autonomy support. The measures used to assess parenting factors included the Social and Emotional Loneliness Scale for Adults-Short form (SELSA-S; DiTommaso et al. 2004, SELSA-S TR; Akgül 2020); the Penn State Worry Questionnaire (PSWQ; Meyer et al. 1990, PSWQ-TR; Boysan et al. 2008); the Inventory of Parent and Peer Attachment (IPPA; Guarnieri et al. 2010, IPPA-T; Kocayörük 2010) and its short form (s-IPPA; Raja et al. 1992, EABE; Günaydın et al. 2005); the short form of the Children's Report of Parent Behavior Inventory (CRPBI; Bögels and van Melick 2004); the Attachment Style Classification Questionnaire (ASQQ; Finzi et al. 2000); the Parental Bonding Instrument (PBI; Parker et al. 1979, ABBÖ; Kapçı and Küçüker 2006); the Parenting Scale (Arnold et al. 1993); the short form of the Egna Minnen Beträffande Uppfostran Questionnaire (EMBU-s; Arrindell et al. 1999); the Experiences in Close Relationships–Revised Scale (ECR-R; Fraley et al. 2000, YIYE-II; Selçuk et al. 2005) and its child version (ECR-RC; Brenning et al. 2014, YIYE-II- Orta Çocukluk ve Erken Ergenlik Dönemi Ölçeği; Kırımer et al. 2014); the Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson et al. 1995; PSDQ-TR; Önder and Gülay 2009); the Lum Emotional Availability of Parents Scale (LEAP; Lum and Phares 2005, LEAP-TR; Gökçe 2013); the Psychological Control Scale-Youth Self-Report (PCS-YSR; Barber 1996, PCS-TR; Sayıl and Kındap 2010); the Perceptions of Parents Scale (POPS; Robbins 1994, POPS-TR; Kocayörük, 2012); the Measure of Attachment Qualities (MAQ; Carver 1997); and the Relationship Scales Questionnaire (RSQ; Griffin and Bartholomew 1994, İAÖ; Sümer and Güngör, 1999).

In addition to these instruments, two studies (Chow and Lo 2017, Lønfeldt et al. 2017a) assessed parent–adolescent interaction using a five-minute tangram puzzle task developed by Hudson and Rapee (2001). During this task, while the child attempted to complete the puzzle, parental involvement and negative behaviors were scored by trained observers.

Quality Assessment

Studies included in the systematic review were evaluated using the AXIS and the NOS tools. All 17 studies assessed with AXIS clearly stated their research aims and employed designs appropriate to those aims. All studies used validated instruments to assess variables related to parenting and metacognitive beliefs, presented key data, and reported analytical results. In every study, findings were interpreted coherently and grounded in the discussion sections. However, only two studies justified their sample sizes. Eleven studies were found to have limited representativeness due to sampling procedures. Additionally, whereas

seven studies reported information about non-responders, the remaining studies did not provide such data or did not take steps to address it. Moreover, while 11 studies explicitly stated the absence of funding or conflicts of interest, this information was unclear in six studies. Overall, despite strengths in methodological rigor and reporting, limitations related to sample size justification and representativeness were notable.

Two studies that were evaluated using the NOS, demonstrated relatively strong methodological features in the domains of sample selection and comparability, with researchers clearly describing sampling procedures and controlling for key confounders. However, both studies showed limitations in the outcome assessment domain. Reliance on self-report measures, lack of blind assessment, and insufficient information regarding follow-up duration represented notable weaknesses. Thus, although selection and comparability domains were methodologically adequate, limitations in outcome assessment procedures placed both studies within the moderate-to-low quality range. AXIS and NOS results for the reviewed articles are presented in Table 3.

Table 3. Results of the assessments conducted using AXIS (n = 17) and NOS (n = 2)

AXIS Assessment (n = 17)

	Yes	No	Do not know/comment
Introduction			
1-Were the aims/objectives of the study clear?	17	0	0
Methods			
2-Was the study design appropriate for the stated aim(s)?	17	0	0
3- Was the sample size justified?	2	15	0
4- Was the target/reference population clearly defined? (Is it clear who the research was about?)	17	0	0
5- Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?	17	0	0
6- Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?	6	11	0
7- Were measures undertaken to address and categorise non-responders?	5	11	1
8- Were the risk factor and outcome variables measured appropriate to the aims of the study?	17	0	0
9- Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?	17	0	0
10- Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)	17	0	0
11- Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	17	0	0
Results			
12- Were the basic data adequately described?	17	0	0
13- Does the response rate raise concerns about non-response bias?	0	17	0
14- If appropriate, was information about non-responders described?	7	9	1
15- Were the results internally consistent?	17	0	0
16- Were the results presented for all the analyses described in the methods?	17	0	0
Discussion			
17- Were the authors' discussions and conclusions justified by the results?	17	0	0
18- Were the limitations of the study discussed?	17	0	0
Other			
19- Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	0	11	6
20- Was ethical approval or consent of participants attained?	16	0	1

NOS Assessment (n = 2)

	Selection	Comparability	Outcome	NOS Score
Anyan et al. 2020	*	**	*	4
Efrati and Spada 2023	**	**	**	6

Relationships between Parenting Factors and Metacognitive Beliefs

Studies generally indicate that metacognitive beliefs are associated with both attachment patterns and parental characteristics. In this context, there is evidence that positive metacognitive beliefs are shaped particularly through individuals' relational experiences. Indeed, positive metacognitive beliefs have been found to be associated with attachment characteristics (Akkuş and Yılmaz 2021, Nordahl et al. 2021, Turliuc et al. 2024), parental emotional availability and autonomy support (Benedetto et al. 2018), psychological control (Benedetto et al. 2018, Lønfeldt et al. 2017b), and low autonomy granting (Lønfeldt et al. 2017b). These findings suggest that positive metacognitive beliefs are closely linked to parental attitudes and familial interaction. Similarly, negative metacognitive beliefs are associated with attachment patterns (Myers and Wells 2015, Akkuş and Yılmaz 2021, Marci et al. 2021, Nordahl et al. 2021, Turliuc et al. 2024) and attachment quality (Demirdöğen et al. 2021), as well as rejecting, punitive, intrusive, and controlling parental attitudes (Spada et al. 2012, Myers and Wells 2015, Lønfeldt et al. 2017b, Benedetto et al. 2018, Brosnan et al. 2020). Examination of metacognitive beliefs in the domains of cognitive confidence and beliefs about uncontrollability and danger indicates that these domains are also associated with attachment patterns (Myers and Wells 2015, Nordahl et al. 2021). The need to control thoughts has been found to be significantly associated with anxious attachment (Myers and Wells 2015, Akkuş and Yılmaz 2021, Nordahl et al. 2021), overprotective parenting (Spada et al. 2012) and psychologically controlling parental attitudes (Lønfeldt et al. 2017b, Benedetto et al. 2018), low autonomy granting (Lønfeldt et al. 2017b), and tendencies toward physical coercion and irrational punishment (Brosnan et al. 2020). Cognitive self-consciousness is significantly associated with attachment patterns (Myers and Wells 2015, Akkuş and Yılmaz 2021, Nordahl et al. 2021), parental verbal hostility (Brosnan et al. 2020), parental emotional availability, and parental psychological control (Benedetto et al. 2018). Finally, cognitive monitoring and beliefs about superstition, punishment, and responsibility have been shown to be associated with attachment quality (Demirdöğen et al. 2021), and superstition has additionally been linked to parental psychological control (Benedetto et al. 2018).

Similarly, associations between global metacognitive tendencies, as represented by total metacognition scores, and related variables have been examined. Total metacognition scores have been found to be significantly associated with parental characteristics (Lønfeldt et al. 2017b, Benedetto et al. 2018, Marino et al. 2019) and parental attitudes (Gallagher and Cartwright-Hatton 2008, Anyan et al. 2020), as well as attachment patterns and attachment quality (Marino et al. 2019, Yavuz et al. 2019, Akkuş and Yılmaz 2021, Demirdöğen et al. 2021). These findings demonstrate that domains of metacognitive beliefs are reinforced through negative interactions, family climate, and forms of control within the family environment.

There are also studies examining the manifestations of metacognitive beliefs in specific behavioral domains; in this regard, metacognitive beliefs related to online gaming and smoking have been investigated. The results of these studies show that metacognitive beliefs regarding online gaming (Efrati and Spada 2023) and smoking (Turliuc et al. 2024) are associated with attachment patterns.

Findings on the associations between metacognitive beliefs and attachment patterns, and parenting styles demonstrate a similar trend in the field of addictive behaviors. Brosnan and colleagues (2020) reported that the physical coercion subdimension of authoritarian parenting style and lack of cognitive confidence predicted cannabis use and that the model explained 34% of the variance. These results indicate that parental attitudes and attachment patterns play a decisive role in the formation and maintenance of metacognitive beliefs.

Mediating Role of Metacognitive Beliefs in the Relationship between Parenting Factors and Psychological Symptoms

Many studies have shown that metacognitive beliefs serve as mediators in the relationship between attachment patterns and psychological symptoms. In the associations between anxious attachment and anxiety, depression, and emotional symptoms, negative metacognitive beliefs about worry appear to play a mediating role (Myers and Wells 2015, Akkuş and Yılmaz 2021). Similarly, Demirdöğen and colleagues (2021)

demonstrated that metacognitions partially mediated the relationship between both maternal and paternal attachment quality and depressive symptoms, and that these variables accounted for approximately 29% of depression.

Similar findings emerge in studies focusing on parental behaviors. Donovan and colleagues (2017), while examining the relationship between parental anxiety and child anxiety, found that children's negative metacognitive beliefs and cognitive avoidance mediated this association. Gallagher and Cartwright-Hatton (2008) also reported that metacognitions partially mediated the relationship between parental overreactivity and chronic worry. The role of metacognitive beliefs has also been examined in relationships between attachment patterns and addictive behaviors. It has been found that both positive and negative metacognitive beliefs mediate the relationships between insecure attachment patterns and online gaming and nicotine addiction (Efrati and Spada 2023, Turliuc et al. 2024). These findings suggest that metacognitive beliefs may function as a critical mechanism in the development of psychological symptoms and addictive behaviors.

Relationships between Parenting Factors, Metacognitive Beliefs, and Psychological Symptoms: Structural Equation Modeling Findings

Some studies examining these relationships more comprehensively have used structural equation modeling (SEM) to test the direct and indirect effects among variables. In the longitudinal study conducted by Anyan and colleagues (2020), loneliness, metacognitive beliefs, and emotion regulation strategies were examined in relation to psychological symptoms, and the authors reported that metacognitive beliefs directly predicted emotion regulation patterns but had only indirect effects on risky behaviors. Similarly, Yavuz and colleagues (2019) confirmed the partial mediating role of metacognitive beliefs in the relationship between attachment quality and somatization symptoms. Marci and colleagues (2021) supported the mediating role of negative metacognitive beliefs about worry in the relationship between attachment patterns and problematic Internet use (PIU), and in the two-stage model by Marino and colleagues (2019), similar indirect effects of attachment dimensions on problematic Facebook use (PFU) and metacognitions were identified. Williams and colleagues (2016) explained the effects of remembered parenting experiences on posttraumatic stress and postpartum depressive symptoms through metacognitions. In that study, conducted with women who had given birth within the past 12 months, mothers' own past parenting experiences were found to have a significant effect on metacognitive beliefs. Lønfeldt and colleagues (2017b) found a significant positive association between maternal psychological control and children's metacognitive beliefs, and furthermore confirmed the mediating role of metacognitive beliefs in the relationship between maternal control and child anxiety. Overall, these models demonstrate that metacognitive beliefs play a decisive role in psychological symptoms through both attachment and parenting processes.

Discussion

This review aimed to systematically examine studies investigating the role of parental acceptance–rejection, control, and general parenting attitudes in the development of maladaptive metacognitive beliefs in individuals. The findings indicate that parent–child relationships and interactions may be significant for the formation of metacognitive beliefs. Early childhood experiences (Bowlby 1979) and factors such as parental warmth and control play an important role in adult psychology (Enns et al. 2002). It has been demonstrated that early-life experiences and the relationship established with the primary caregiver have shaping effects on cognitive structure (Sharp and Fonagy 2008, Groh et al. 2017) and self-regulation (Sharp and Fonagy 2008); and that these experiences may function as a risk factor when they contain negative qualities, or as a protective factor when supported by secure relational patterns (Enns et al. 2002).

In this review, attachment patterns were the most frequently studied parenting factor associated with metacognitive beliefs. The findings suggest that attachment anxiety may lead to maladaptive metacognitive beliefs and, in this regard, may contribute to various psychological problems such as

anxiety (Gallagher and Cartwright-Hatton 2008), depression (Akkuş and Yılmaz 2020), somatization (Yavuz et al. 2019), trauma (Williams et al. 2016), and addiction (Marci et al. 2021, Efrati and Spada 2023, Turliuc et al. 2024). Moreover, the studies provide information on the significant effect of insecure attachment on children's cognitive and emotional development (Yavuz et al. 2019). Insecure attachment patterns and internal working models may pose an obstacle to healthy metacognitive development. In this context, it has been reported that weak metacognitive skills hinder the evaluation of cognitive processes and lead to maladaptive behavioral responses (Fonagy 1997). Therefore, attachment patterns may play a precursor role in the development of metacognitive beliefs (Akkuş and Yılmaz 2021).

When examining the relationship between insecure attachment patterns and metacognition in more detail, it becomes evident that persistent anxiety in close relationships promotes the development of beliefs about worry. To cope with a negative situation or emotion, individuals engage in various strategies, and at this point, the coping mechanisms within the repertoire of the attachment system become activated. These coping strategies often coexist with rigid and maladaptive forms of emotion regulation (D'Agostino et al. 2017). In anxious individuals, hyperactivation may serve as a coping strategy aimed at reducing the imbalance between the magnitude of the problem and their capacity to handle it (Mikulincer and Shaver 2016). This attitude may bring about cognitive and emotional reactions such as worry, rumination, and self-focused attention (Cassidy 1994). Considering that insecure attachment patterns may lead to negative behaviors through maladaptive cognitions (Myers and Wells 2015), substitute objects of dependency may emerge over time to fulfill attachment needs (Turliuc et al. 2024). A similar pattern appears in another study as well (see Marino et al. 2019). Based on these findings, it may be possible to suggest that metacognitive beliefs trigger maladaptive coping strategies and that addictions may be interpreted as an attempt at self-regulation. These reactive coping styles may trigger the Cognitive Attentional Syndrome, a mechanism that contributes to the maintenance of psychological problems (Myers and Wells 2015).

In avoidant attachment patterns, suppression strategies may lead to the development of beliefs concerning the uncontrollability and danger of metacognitive processes (Moss et al. 2015). In this pattern, individuals attempt to cope with negative thoughts and emotions through deactivation strategies. However, because suppression can also contribute to the CAS, the problem persists in a similar manner. The findings of the study conducted by Nordahl and colleagues (2021) suggest that insecure attachment patterns may constitute a potential risk factor that could lead to impairments in metacognitive functioning.

Another parenting-related variable examined in the studies was parenting styles. A harsh and punitive dysfunctional parenting style is associated with metacognitive beliefs. Such parenting may lead individuals to use worry as a safety strategy to avoid harsh punishment, thereby fostering the development of positive metacognitive beliefs (Marci et al. 2021). Furthermore, exposure to unpredictable and harsh reactions may contribute to negative metacognitive beliefs related to uncontrollability and danger, while a critical parental attitude may influence the development of negative metacognitive beliefs related to cognitive confidence due to low self-esteem (Gallagher and Cartwright-Hatton 2008). Overprotective and overreactive parental attitudes also emerge as important parenting factors in the development of metacognitive beliefs. It has been emphasized that overprotective parenting may hinder the child's acquisition of autonomy, reduce their sense of control, and lead to low self-efficacy (Chorpita and Barlow 1998). Similarly, overly reactive parenting may contribute to a lack of self-confidence (Gallagher and Cartwright-Hatton 2008). It has been proposed that children may use worry as a tool to detect potential threats in advance in order to avoid losing parental affection (Lønfeldt et al. 2017b), and that metacognitive beliefs may emerge when children apply their negative evaluations to their own cognitions (Gallagher and Cartwright-Hatton 2008).

The findings obtained from the review can be considered within the framework of Krohne and Hock's (1991) "two-process model" This model focuses on the association between specific parenting behaviors and children's coping skills, proposing that the familial context may play a role in shaping cognitive biases and threat perception in children. The model assumes that cognitive structures develop through social experiences, particularly through the influence of parental attitudes and behaviors (Barrett et al. 1996). Similarly, metacognitive theory posits that maladaptive cognitive styles contribute to psychopathology

(Wells and Matthews 1996). According to Tennant (2005), cognitive style is defined as "a characteristic and consistent approach to organizing and processing information," and two primary pathways are proposed for its formation (Chow and Lo 2017). The first is the direct modeling of parental beliefs; however, the literature reports inconsistent and debated findings regarding this pathway. The second pathway is the indirect influence of parenting behaviors on individual belief systems. The findings of the studies reviewed here appear to particularly support this second pathway. These theoretical inferences regarding the relationship between parenting and metacognition should be evaluated in light of the methodological structures of the examined studies. Overall, the findings of this review reveal the relationship between parental factors and the formation of metacognitive beliefs. Additionally, they support the potential use of existing metacognitive therapies in this context and provide a basis for the development of new interventions targeting parental attitudes.

Although important findings have been presented that may shed light on the relationship between parenting factors and metacognitive beliefs based on the reviewed studies, there are several methodological limitations in the existing literature. The considerable heterogeneity of the measurement tools used restricts the comparability of the findings and the conceptual diversity. In addition, insufficient sample sizes and the lack of follow-up assessments designed to track long-term effects constitute important limitations of the studies. Moreover, the predominant reliance on self-report measures increases the risk of social desirability bias. Furthermore, some of the included studies were conducted with specific samples (e.g. adults with high body mass index, adults using cannabis, women who have given birth), and the overall limited number of studies restricts the generalizability of the findings. In some of the included studies, the sample carried limitations in terms of representing the target population; in certain studies, the participant selection process was not designed to reflect the population under investigation. This further restricts the generalizability of the findings. Additionally, the relevant literature includes very few longitudinally designed studies. This limits the ability to clearly establish causal relationships. The predominantly cross-sectional nature of the research restricts the evaluation of changes over time; therefore, future studies with longitudinal designs are needed. Alongside the limitations of the included studies, the systematic review itself also has constraints. Because the review included only studies in English and Turkish, the inability to incorporate studies in other languages represents a limitation of the systematic review.

Although this review provides insights into the relationships between parenting factors and metacognitive beliefs, research aimed at understanding how this relationship develops remains limited. The existing literature predominantly consists of cross-sectional studies and focuses mainly on attachment patterns. Consequently, this makes it difficult to establish causal relationships and changes over time. Future studies would benefit from testing mediation models that may explain the effects of parenting attitudes on metacognition and from examining the developmental and environmental mechanisms underlying this relationship. Moreover, studies that address different parenting factors longitudinally could reveal the long-term effects of parental behaviors on the development of metacognition. Such studies are expected to strengthen theoretical explanations and be applicable in intervention programs.

Conclusion

In this systematic review, the relationship between parenting factors and metacognitive beliefs was examined in an effort to better understand the association between these variables. The results of the systematic review reinforce the importance of family involvement in the treatment of maladaptive metacognitive beliefs. After reviewing 19 studies, it was observed that parenting factors such as insecure attachment patterns, low attachment quality, parental rejection, overprotective attitudes, and parenting style may have a shaping effect on metacognitive beliefs. Accordingly, while negative parenting conditions may serve as risk factors for negative metacognitive beliefs, positive parenting factors may play a protective role. In this respect, developing interventions aimed at reducing risks associated with metacognitive beliefs, particularly those targeting factors such as parental acceptance, rejection, and levels of control, may contribute significantly to preventive practices and treatment approaches.

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Authors Contributions: The author(s) have declared that they have made a significant scientific contribution to the study and have assisted in the preparation or revision of the manuscript
Peer-review: Externally peer-reviewed.
Ethical Approval: This review study does not require ethical clearance.
Conflict of Interest: No conflict of interest was declared.
Financial Disclosure: No financial support was declared for this study.