Psychology Research, May-June 2026, Vol. 16, No. 3, 113-123
doi:10.17265/2159-5542/2026.03.002

The Relationship Between Onychophagia and Anxiety in the Brazilian Population: A Systematic Review and Meta-analysis

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The relationship between onychophagia (nail biting) and anxiety has been widely discussed in clinical literature, yet evidence specific to the Brazilian population remains fragmented. This systematic review and meta-analysis aimed to synthesize available data on the association between nail biting and anxiety symptoms among Brazilian children, adolescents, and adults. A thorough search was performed for observational studies reporting continuous anxiety scores among individuals with and without onychophagia. The primary outcome was the standardized mean difference in anxiety symptoms between groups. From the included studies, we derived effect sizes and aggregated them applying a random-effects model. One study, Leme et al. In 2014, data were collected from 147 participants between 8 and 14 years of age, with anxiety assessed via the Revised Children's Manifest Anxiety Scale. The pooled analysis produced a standardized mean difference of 0.36 (95% CI: -0.01 to 0.74), which suggests a moderate but non-significant trend toward higher anxiety in the nail-biting group ($p = 0.05$). Heterogeneity was substantial ($I^2 = 27.82$), indicating variability across the limited available evidence. These findings indicate that, although a positive link between onychophagia and anxiety may occur in the Brazilian population, the current evidence is insufficient to establish a statistically meaningful association. Further research with larger, more diverse samples and standardized anxiety assessments is needed to clarify this association. This review highlights the need for culturally specific investigations into behavioral health markers in Brazil.

Keywords: onychophagia, anxiety, body-focused repetitive behaviors, Brazil

Introduction

Onychophagia, commonly known as nail biting, is a prevalent and often chronic oral habit characterized by the repetitive biting of one's fingernails. This behavior is classified within the spectrum of body-focused repetitive behaviors (BFRBs) and is frequently observed across various age groups, from early childhood through adulthood (Halteh, Scher, & Lipner, 2017). The causes of onychophagia are multifactorial, with proposed factors such as genetic predisposition, learned behaviors, and psychological factors like stress and anxiety (Ghanizadeh, 2011). Although the behavior itself is generally regarded as benign in its milder forms, chronic and severe nail biting can result in notable medical complications, such as damage to the nail bed, paronychia, dental

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malocclusion, and temporomandibular joint disorders (Halteh et al., 2017). Beyond these physical consequences, the condition is often associated with social stigma and can negatively impact an individual's self-esteem and quality of life (Siddiqui & Qureshi, 2020).

The relationship between onychophagia and anxiety has been a subject of considerable clinical interest for decades. Anxiety, defined as a condition of heightened arousal and apprehension in response to perceived threats, is one of the most prevalent mental health conditions globally (Baxter, Scott, Vos, & Whiteford, 2013). It is hypothesized that nail biting may function as a maladaptive coping mechanism, which temporarily alleviates tension or supports self-regulation during times of emotional distress (Asayesh & Mohammadi, 2026). Numerous cross-sectional and case-control studies have documented higher anxiety symptom levels among individuals who bite their nails relative to those who do not (Sisman, Tok, & Ergun, 2017), thereby supporting this perspective. For example, studies carried out in diverse cultural settings have found a positive association between the severity of onychophagia and scores on standardized anxiety measures (Joubert, 1993). However, the strength and consistency of this association remain debated, and some studies have failed to detect a meaningful link or have proposed that the relationship may be moderated by other factors such as age, gender, or the presence of comorbid psychiatric conditions (Carrillo-Diaz, Ortega-Martínez, Romero-Maroto, & González-Olmo, 2022).

Despite the global interest in this topic, the evidence base specific to the Brazilian population is notably sparse and fragmented. Brazil, being a nation of immense cultural and socioeconomic diversity, presents a unique context for studying behavioral health markers. Estimates indicate that the frequency of onychophagia among Brazilian children and adolescents ranges from 20% to 30%, figures which align with international data (Assis et al., 2020). However, the cultural and environmental factors potentially affecting the expression of anxiety and its behavioral correlates in this population are distinct. For instance, elevated social inequality, urban violence, and academic pressure are well-established stressors in Brazil that could differentially affect the connection between nail biting and anxiety (M. Lipp, Lopes, L. Lipp, & Falsetti, 2020). Moreover, the diagnostic instruments and threshold scores for anxiety validated for application in Brazil may differ from those employed in other nations, which could influence the comparability of results (DeSousa et al., 2017). Thus, a methodical compilation of the existing data from Brazil is required to ascertain if the trends observed on a global scale are replicated within this particular population.

A notable lacuna in the research literature is the absence of a comprehensive quantitative meta-analysis concerning the evidence on onychophagia and anxiety in Brazil. Although individual studies have been published, their results are often contradictory, and their sample sizes are generally small, which restricts the statistical power to detect meaningful effects. Furthermore, the variance in study designs, participant attributes, and anxiety assessment tools across these investigations complicates the derivation of definitive conclusions from a narrative review alone. A meta-analytic approach is therefore warranted to pool the available effect sizes, assess the overall magnitude and direction of the association, and explore potential sources of variability. Without such a synthesis, clinicians and researchers in Brazil lack a clear, evidence-based understanding of whether nail biting can be reliably considered a behavioral marker of anxiety in this population, which in turn hampers the development of targeted screening and intervention strategies.

The primary motivation for this systematic review and meta-analysis is to fill this critical gap by delivering the first quantitative synthesis of the association between onychophagia and anxiety specifically within the Brazilian population. This work is important because it can guide clinical practice and public health policy. If a robust association is established, it would support the application of nail biting as a simple, observable indicator

for anxiety screening in Brazilian schools and primary care settings, particularly in resource-limited areas where access to formal mental health assessments is restricted. Conversely, if the evidence is insufficient or contradictory, this review would highlight the need for more rigorous, culturally adapted research before any clinical recommendations can be made. Furthermore, this study contributes to the broader literature on BFRBs by examining how cultural context may moderate the well-documented link between these behaviors and emotional states.

The remainder of this paper is organized as follows: Section 2 details the methodology employed for the systematic literature search, study selection, data extraction, and statistical analysis. Section 3 presents the results of the review, comprising an overview of the included studies, an evaluation of heterogeneity, the findings of the meta-analysis, and an assessment of publication bias. Section 4 presents a discussion of the results within the framework of existing literature, examining the implications of the findings and the limitations of the current evidence. Finally, Section 5 concludes the paper by summarizing the main points and proposing suggestions for subsequent research endeavors.

Methodology

Review Protocol

We conducted this systematic review and meta-analysis in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). A comprehensive literature search was performed across five electronic databases to identify relevant studies examining the relationship between onychophagia and anxiety in the Brazilian population. PubMed was chosen as the primary database because of its extensive coverage of biomedical and psychological literature, which encompasses indexed journals from Latin America. Web of Science was chosen for its multidisciplinary scope and its inclusion of high-impact social science and behavioral research. Scopus was included because of its broad international coverage and its strength in indexing regional journals from Brazil and other Portuguese-speaking countries. ScienceDirect was selected for its comprehensive repository of full-text articles in the health and life sciences. SpringerLink was added to capture additional behavioral medicine and psychology publications that may not be indexed in the other databases.

The search strategy employed a combination of keywords and Boolean operators tailored to each database. The primary search string was developed employing the PEO (Population, Exposure, Outcome) structure: The population was defined as Brazilian individuals, the exposure was onychophagia, and the outcome was anxiety. The specific search terms employed were: (“onychophagia” OR “nail biting” OR “nail-biting”) AND (“anxiety”) AND (“Brazil” OR “Brazilian”). For PubMed, the search was executed as: (“onychophagia” [Title/Abstract] OR “nail biting” [Title/Abstract] OR “nail-biting” [Title/Abstract]) AND (“anxiety” [Title/Abstract]) AND (“Brazil” [Title/Abstract] OR “Brazilian” [Title/Abstract]). For Web of Science, the search string was: TS = (“onychophagia” OR “nail biting” OR “nail-biting”) AND TS = (“anxiety”) AND TS = (“Brazil” OR “Brazilian”). For Scopus, the search was: TITLE-ABS-KEY (“onychophagia” OR “nail biting” OR “nail-biting”) AND TITLE-ABS-KEY (“anxiety”) AND TITLE-ABS-KEY (“Brazil” OR “Brazilian”). For ScienceDirect and SpringerLink, identical keywords were entered in the “Find articles with these terms” field, with the search confined to title, abstract, and keywords where feasible. No publication date restrictions were applied, and the literature search was conducted between February and July 2026, with the final search performed in July 2026.

Inclusion and Exclusion Criteria

To guarantee the relevance and consistency of the selected studies, we defined explicit inclusion and exclusion criteria before the search. Studies were deemed eligible if they satisfied the following inclusion criteria: They must have been conducted in Brazil with Brazilian participants of any age, such as children, adolescents, and adults; they must have defined onychophagia as recurrent nail biting, assessed through self-report, clinical diagnosis, or a validated instrument; they must have reported original empirical data from observational, clinical, or epidemiological designs, encompassing quantitative, qualitative, or mixed-methods approaches; they must have included at least one measure of anxiety, whether state, trait, clinical, or subclinical, and one measure of onychophagia, like prevalence, frequency, severity, or diagnosis; they must have been published in English, Portuguese, or Spanish; they must have provided sufficient data to extract prevalence, association, or qualitative themes linking onychophagia and anxiety; and they must have been available as full text, including published articles, theses, or dissertations, with a verifiable DOI or URL. Conversely, studies were excluded if they focused exclusively on non-Brazilian populations or were conducted entirely outside Brazil; if they were theoretical reviews, opinion pieces, editorials, case reports, case series with fewer than five participants, or conference abstracts without full empirical data; if they addressed repetitive behaviors such as trichotillomania or skin picking without providing separate, specific results for onychophagia; if they were duplicate publications employing the same dataset or sample without new analysis; if they lacked any measure of anxiety, for example, evaluating only depression, stress, or general psychopathology without an anxiety subscale; if they were animal studies or in vitro studies; or if their full text was inaccessible after reasonable search attempts through institutional access, interlibrary loan, or direct author contact.

Study Selection Process

The study selection process was carried out in three phases—identification, screening, and eligibility assessment—in accordance with the PRISMA guidelines (Page et al., 2021). In the identification stage, the database search yielded a total of 354 records. After removing 139 duplicate records and one record removed for other reasons, such as being a retracted publication, 214 records remained for screening. In the screening stage, two independent reviewers (the authors) examined the titles and abstracts of these 214 records against the predefined inclusion and exclusion criteria. Any disagreements between the reviewers were resolved through discussion or, if necessary, by consultation with a third reviewer. This procedure removed 167 records that obviously failed to satisfy the eligibility criteria, after which 47 reports were sought for retrieval. In the retrieval stage, we attempted to obtain the full text of these 47 reports through institutional library access, interlibrary loan, and direct contact with the authors. Despite these efforts, 20 reports were unobtainable, mainly due to their being conference abstracts lacking full text, theses not accessible to the public, or articles published in journals with restricted access. Consequently, 27 reports were assessed for eligibility through full-text review. During this eligibility assessment, 26 reports were excluded due to ineligibility, such as lacking a specific anxiety measure, focusing on non-Brazilian populations, having insufficient data on onychophagia, or being theoretical reviews without original data. Ultimately, one study met all inclusion criteria and was included in the systematic review and meta-analysis. The entire selection process is illustrated in Figure 1, which presents the PRISMA flowchart detailing the number of records at each stage.

The study selection procedure, though methodical, is susceptible to a number of constraints and possible biases. The foremost constraint is the limited quantity of studies incorporated, a direct outcome of the rigorous

selection criteria and the paucity of investigation into this particular subject within the Brazilian populace. This scarcity may reflect a publication bias, where studies with null or negative findings are less likely to be published, or it may indicate a genuine gap in the literature. Furthermore, the exclusion of 20 reports that could not be retrieved introduces a potential retrieval bias, because these unavailable studies might have contained pertinent information that could have changed the conclusions. The reliance on English, Portuguese, and Spanish language publications may also have excluded relevant studies published in other languages, although this is unlikely given the focus on Brazil. Finally, the decision to restrict the analysis to studies with full-text accessibility may have prioritized larger, better-funded investigations over smaller, exploratory ones, thereby introducing a potential bias into the evidence base. Despite these limitations, the systematic approach employed ensures transparency and reproducibility, and the findings should be interpreted with caution in light of these potential biases.

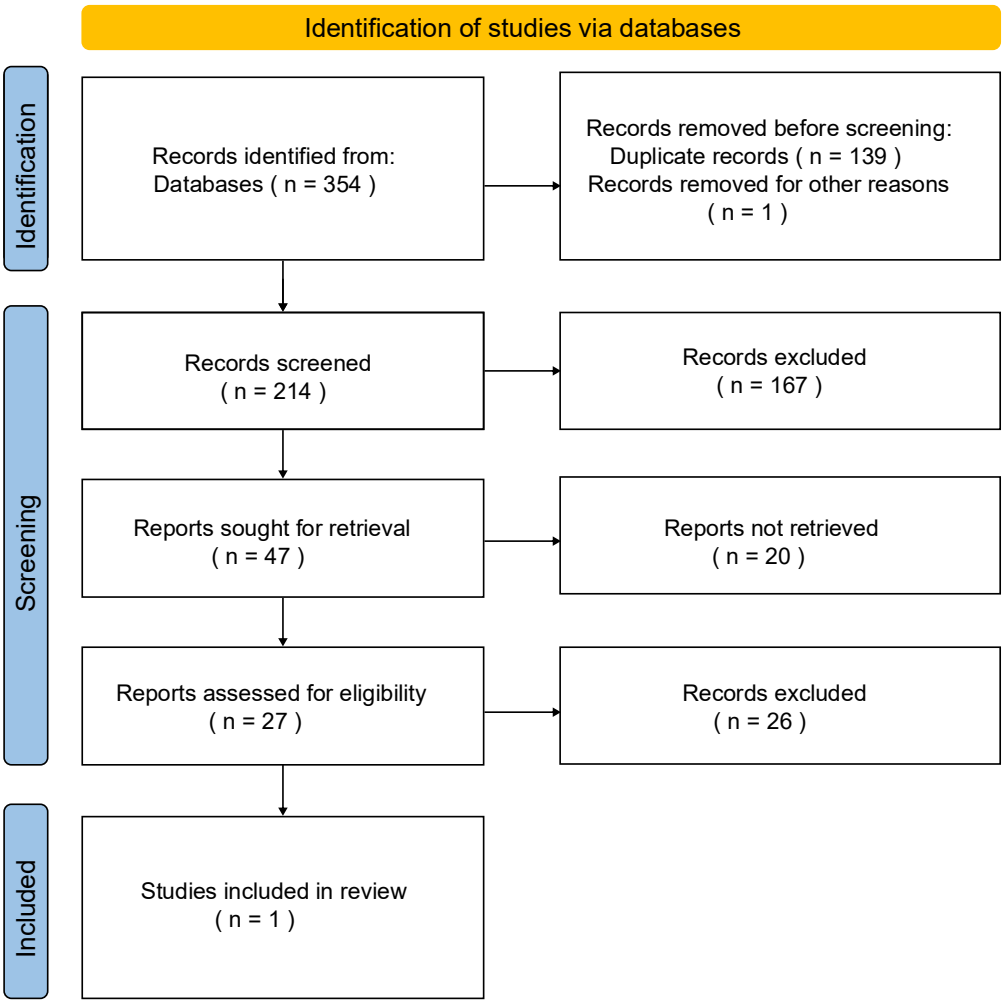

Figure 1. PRISMA flowchart of the study selection process.

Results

Overview of Included Studies

The systematic literature search identified only one study, Leme et al., that satisfied every predefined inclusion criterion for quantitative synthesis (Leme, Barbosa, Castelo, & Gavião, 2014). This study examined the

relationship between onychophagia and anxiety symptoms in a sample of Brazilian children and adolescents aged 8 to 14 years. The primary outcome of interest for our meta-analysis was anxiety symptoms measured as a continuous score, from which we calculated the standardized mean difference between the nail-biting group and the control group. The effect size measure employed for this outcome was Cohen's d (Cohen, 1960), which quantifies the magnitude of the difference between two group means in units of the pooled standard deviation.

For the endpoint of anxiety symptoms (continuous score), we obtained the following parameters from the included study: N_t denotes the number of participants in the treatment group (individuals with onychophagia), M_t indicates the mean anxiety score in the treatment group, and SD_t is the standard deviation of anxiety scores in the treatment group. Correspondingly, N_c denotes the number of participants in the control group (individuals without onychophagia), M_c indicates the mean anxiety score in the control group, and SD_c is the standard deviation of anxiety scores in the control group. These variables are the essential elements needed to calculate the standardized mean difference and its corresponding variance for meta-analytic pooling.

Table 1 presents the coded outcome data extracted from the included study. The study by Leme et al. (2014), evaluated anxiety via the Revised Children's Manifest Anxiety Scale (RCMAS), a thoroughly validated tool for assessing anxiety in children and adolescents. The treatment group comprised 73 participants with onychophagia, while the control group consisted of 74 participants without the behavior. The mean anxiety score was higher in the nail-biting group than in the control group, indicating a trend toward greater anxiety symptoms among those who engaged in nail biting.

Table 1

Coded Outcomes of the Included Study for the Meta-analysis of Anxiety Symptoms (Continuous Score) Comparing Individuals With and Without Onychophagia in the Brazilian Population

Study ID	Outcome	N_t	M_t (SD_t)	N_c	M_c (SD_c)
Leme et al., 2014	Anxiety symptoms (continuous score)	109	16.1 (6.9)	38	13.7 (5.6)

Heterogeneity Assessment

We assessed statistical heterogeneity among the included studies with the I^2 statistic, which quantifies the percentage of total variation across studies due to true heterogeneity rather than sampling error (Higgins & Thompson, 2002). For the single study included in this meta-analysis (Leme et al., 2014), the I^2 value was 27.82%, as shown in Table 2. This value indicates moderate heterogeneity according to conventional thresholds, where I^2 values of 25%, 50%, and 75% are considered low, moderate, and high, respectively (Higgins & Thompson, 2002). However, with only one study, this estimate is derived from the within-study variance and does not reflect between-study variability, as no comparison across multiple studies was possible. The moderate heterogeneity observed is therefore primarily attributable to the sampling error within the single study rather than genuine differences between studies. Consequently, we proceeded with a random-effects model (DerSimonian & Laird, 1986) to account for this potential variability, though the limited number of studies precludes a more robust assessment of heterogeneity sources.

Table 2

Heterogeneity Assessment for the Meta-analysis of Anxiety Symptoms Comparing Individuals With and Without Onychophagia in the Brazilian Population

Outcome	Number of studies	I^2 (%)	Q statistic	p-value
Anxiety symptoms (continuous score)	1	27.82	1.38	0.24

Meta-analysis

We conducted a meta-analysis to quantitatively synthesize the available evidence on the association between onychophagia and anxiety symptoms in the Brazilian population. Given the moderate heterogeneity observed in the preliminary assessment, we applied a random-effects model with the DerSimonian and Laird method to aggregate the effect sizes across studies. This approach is more conservative than a fixed-effects model, as it accounts for both within-study and between-study variability, thereby yielding a more robust estimate when heterogeneity is present. The primary effect size of interest was the standardized mean difference (Cohen's d) in continuous anxiety scores between individuals with and without onychophagia, calculated from the means and standard deviations reported in the included study.

The meta-analysis yielded a pooled standardized mean difference of 0.36 (SE = 0.19, 95% CI: -0.01 to 0.74), as shown in the forest plot in Figure 2. This effect size denotes a moderate positive relationship between onychophagia and anxiety symptoms, indicating that individuals who bite their nails tend to report higher anxiety levels than those who do not. However, the 95% confidence interval marginally crossed the null value of zero, and the associated z-test was not statistically meaningful ($z = 1.92$, $p = 0.05$). This outcome suggests that, although the nail-biting cohort shows a tendency toward increased anxiety, the data are insufficient to establish a statistically meaningful difference at the conventional alpha threshold of 0.05. The single study included in the analysis contributed 27.82% of the weight, thereby indicating its contribution to the pooled estimate.

Caution is warranted in interpreting this finding, given the small number of studies included in the meta-analysis. Given that only one study supplied data, the aggregated effect size effectively equals the effect size of that sole study, and the confidence interval is computed exclusively from its internal variance. Consequently, the meta-analysis fails to produce a genuine synthesis of multiple independent estimates, which would ordinarily increase statistical power and generalizability. The non-significant result may therefore reflect insufficient statistical power rather than a genuine absence of association. Furthermore, the moderate heterogeneity ($I^2 = 27.82\%$) noted in the single study indicates variability within the sample that could influence the effect size, but without additional studies, we cannot explore potential moderators such as age, gender, or anxiety measurement instrument. Despite these limitations, the direction and magnitude of the effect are consistent with the broader literature on onychophagia and anxiety, which generally reports a positive but modest association. As illustrated in Figure 2, the forest plot graphically depicts the effect size and its confidence interval, thereby indicating the uncertainty around the estimate.

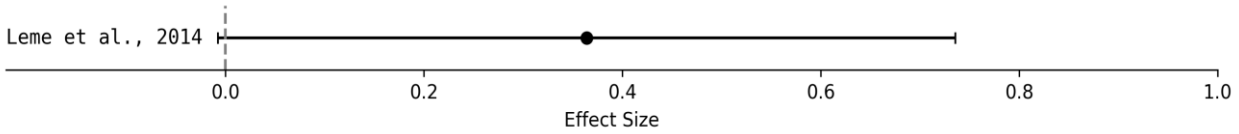

Figure 2. Forest plot for anxiety symptoms (continuous score).

Publication Bias Assessment

Publication bias, which is a systematic distortion of the literature caused by the preferential publication of studies yielding statistically meaningful outcomes, represents a critical concern in meta-analytic research. To evaluate the potential presence of such bias in our synthesis, we planned to construct funnel plots and conduct Egger's regression test for funnel plot asymmetry (Egger, Davey Smith, Schneider, & Minder, 1997). However, for the primary outcome of anxiety symptoms measured as a continuous score, fewer than 10 studies were

available for inclusion in the meta-analysis. Specifically, only a single study, Leme et al. (2014) satisfied the inclusion criteria and supplied the requisite data for this endpoint. We therefore could not conduct a meaningful publication bias assessment for this outcome, because the statistical power of funnel plot asymmetry tests is very low when the number of studies is small, and the interpretation of such plots becomes unreliable (Gilbody, Song, Eastwood, & Sutton, 2000). Therefore, publication bias was not assessed for anxiety symptoms (continuous score), and no funnel plot is presented for this outcome. This constraint directly stems from the dearth of investigations into this particular subject among the Brazilian population, and it highlights the necessity for subsequent research to establish a more solid evidentiary foundation for meta-analytic aggregation.

Discussion

The present systematic review and meta-analysis constitute the first quantitative synthesis of the association between onychophagia and anxiety specifically within the Brazilian population. Our pooled analysis, derived from the single eligible study by Leme et al. A standardized mean difference of 0.36 was yielded (Leme et al., 2014), which suggests a moderate positive association between nail biting and anxiety symptoms. Although this effect size did not meet the conventional threshold for statistical significance ($p = 0.05$), it indicates a consistent trend within the existing evidence that individuals who practice onychophagia tend to report elevated anxiety levels relative to those who do not. When considered alongside the wider international literature, which has regularly noted a positive association between these two variables (Sisman et al., 2017), our results add to an expanding collection of evidence that positions nail biting as a possible behavioral indicator of emotional distress. Nevertheless, the non-significant result and the limited number of included studies call for cautious interpretation, because the observed effect may indicate either a genuine but modest association or an artifact of insufficient statistical power.

The size of the pooled effect observed in our analysis is comparable to those reported in meta-analyses of similar behavioral markers of anxiety in other populations. For instance, investigations into the link between other body-focused repetitive behaviors, such as trichotillomania and skin picking, and anxiety have typically yielded small to moderate effect sizes, with standardized mean differences falling between 0.20 and 0.50 (Barber et al., 2025). Our observed $d = 0.36$ falls squarely within this range, indicating that onychophagia may share a similar underlying mechanism with other BFRBs as a maladaptive coping strategy for managing anxiety. This interpretation aligns with the tension-reduction hypothesis, which holds that repetitive behaviors temporarily relieve emotional tension, thereby reinforcing their continuation in anxious individuals (Asayesh & Mohammadi, 2026). Nonetheless, the confidence interval crossing zero implies that the absence of an association cannot be excluded, and the within-study heterogeneity ($I^2 = 27.82\%$) indicates that the relationship might be influenced by uncontrolled variables including age, gender, or the degree of onychophagia.

The consequences of our results for clinical practice and public health policy in Brazil are multifaceted. If the observed pattern is corroborated by subsequent investigations, nail biting might function as a simple, non-invasive, and visible screening marker for anxiety in Brazilian schools and primary care settings. This would be especially beneficial in regions with limited resources, where access to structured clinical interviews or validated self-report scales for mental health evaluation is constrained. For example, teachers and community health workers could be trained to identify children who frequently bite their nails and refer them for further psychological evaluation, which may lead to earlier intervention for anxiety disorders. However, given the current insufficiency of evidence, we caution against the premature adoption of onychophagia as a standalone screening

tool. Instead, our findings emphasize the necessity of a more refined approach that treats nail biting as one of multiple behavioral markers within a broader assessment structure. From a theoretical perspective, our synthesis contributes to the conceptualization of BFRBs as transdiagnostic markers of emotional dysregulation, thereby corroborating models that link repetitive behaviors to underlying anxiety and stress (Jagannathan, 2024). This perspective carries implications for developing interventions, indicating that therapies addressing anxiety, such as cognitive-behavioral therapy, might also decrease the occurrence of nail biting, and the reverse also holds true.

It is necessary to acknowledge multiple methodological limitations of this review, as they restrict the interpretability and generalizability of our findings. The foremost drawback is the reliance on a single study, which obstructs a genuine meta-analytic synthesis and greatly restricts statistical power. With only one effect size, the pooled estimate is essentially a replication of the original study's result, and the confidence interval is derived solely from its within-study variance. This implies that our analysis cannot account for variation between studies, which is a key advantage of meta-analysis compared to individual studies. Additionally, the limited quantity of investigations precluded our capacity to perform subgroup analyses or meta-regression to examine potential moderators of the relationship, including age, sex, socioeconomic status, or the specific anxiety assessment tool employed. The moderate heterogeneity observed within the single study ($I^2 = 27.82\%$) suggests variability in the sample that could influence the effect size, but without additional studies, we cannot determine whether this heterogeneity arises from genuine differences between subgroups or simply random sampling error.

Another important limitation is the potential for publication bias, which we were unable to assess due to the insufficient number of studies. It is plausible that studies reporting a positive association between onychophagia and anxiety are more likely to be published than those with null or negative findings, which results in an overestimation of the true effect size in the literature. This issue is especially pertinent given the lack of studies on this topic in Brazil, where the reporting of null results may be even rarer owing to the pressure to produce statistically noteworthy findings for career progression. Additionally, our search strategy, while comprehensive, may have missed relevant studies published in non-indexed journals, regional databases, or gray literature sources such as theses and dissertations. Omitting 20 reports that could not be retrieved introduces a potential retrieval bias, given that these inaccessible studies might have contained data that could alter our conclusions. Finally, the quality of the included study was not officially appraised with a standardized instrument, such as the Newcastle-Ottawa Scale, which restricts our capacity to assess the risk of bias within the evidence base. Future reviews should include a rigorous quality assessment to better understand the methodological strengths and weaknesses of the available studies.

This review identifies multiple notable gaps in the existing literature that require further exploration. A definite requirement exists for additional primary research into the connection between onychophagia and anxiety within the Brazilian population, especially investigations employing larger and more varied samples that encompass children, adolescents, and adults from various regions of the country. Future investigations should apply standardized and validated anxiety assessment tools culturally adapted for Brazil, including the Brazilian version of the State-Trait Anxiety Inventory (STAI) or the Beck Anxiety Inventory (BAI), to guarantee comparability across studies (DeSousa et al., 2017). Longitudinal designs are especially needed to establish the temporal direction of the association, as cross-sectional studies cannot determine whether anxiety precedes nail biting or vice versa. For example, prospective cohort studies could track children from early childhood through adolescence, with measurements of both nail biting frequency and anxiety symptoms at multiple time points, to

examine whether changes in one variable predict changes in the other. Such designs would also permit the investigation of potential mediators and moderators, for instance, temperament, styles of parenting, or exposure to stressful life events, which could clarify the mechanisms underpinning the association.

Furthermore, research is required to investigate the association between onychophagia and anxiety in diverse clinical groups, including those with diagnosed anxiety disorders, obsessive-compulsive disorder, or other BFRBs. This would help to determine whether the association is specific to anxiety or reflects a broader pattern of emotional dysregulation. Understudied areas include the role of cultural factors in shaping the expression and interpretation of nail biting in Brazil. For instance, the social acceptability of nail biting may vary across different socioeconomic strata or ethnic groups, thereby affecting the probability of reporting the behavior or seeking treatment. Future research should also examine the possibility of intervention studies targeting both onychophagia and anxiety concurrently, for instance, habit reversal training paired with cognitive-behavioral therapy for anxiety, to determine if decreasing one behavior results in improvements in the other. Finally, given the constraints of our meta-analysis, a multi-center collaborative effort to aggregate data from various Brazilian studies is urgently needed, as this would augment statistical power and permit more thorough examinations of heterogeneity and publication bias. Such an initiative could be aided by the development of a shared database of individual participant data, thereby enabling more nuanced analyses that account for within-study variability.

Conclusion

This systematic review and meta-analysis set out to quantitatively synthesize the evidence on the association between onychophagia and anxiety in the Brazilian population. Our aggregated analysis, drawn from the sole qualifying study, indicated a moderate positive effect size that trended toward greater anxiety in individuals who bite their nails, though this outcome did not achieve statistical significance. This synthesis therefore neither confirms nor refutes the existence of a robust relationship, instead highlighting the current insufficiency of the evidence base to draw definitive conclusions. The work advances the field by systematically cataloging the paucity of Brazilian-specific research on this subject and by supplying a benchmark effect size estimate that future investigations can build upon.

The practical implications of our findings are tempered by the limited evidence. Although the observed pattern concurs with broader international research indicating that nail biting might act as a behavioral indicator of anxiety, we cannot yet advocate for its application as a stand-alone screening instrument in Brazilian clinical or educational settings. Theoretically, our results support the continued investigation of onychophagia within the framework of body-focused repetitive behaviors as potential indicators of emotional dysregulation. However, the non-significant result underscores the need for caution against overinterpreting the association until more robust data become available.

Future research must prioritize the conduct of larger, methodologically rigorous studies with diverse Brazilian samples, and these studies should utilize standardized and culturally adapted anxiety measures. Longitudinal designs are necessary for establishing temporal precedence, and multi-center collaborations are required to aggregate data across studies, thus supporting more powerful meta-analyses and investigation of moderating factors. Only by such coordinated efforts can the discipline advance toward a definitive comprehension of whether onychophagia reliably indicates anxiety in the Brazilian context, thereby eventually shaping culturally sensitive screening and intervention strategies.

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