

Body Focused Repetitive Behaviours: A Systematic Review of Prevalence Emotion Regulation and Interventions

Chiranjeevi Karthik Kuruganti

Centre of Distance and Online Education, JAIN (Deemed-to-be-University), Bengaluru, India

Corresponding Author Email: [chiranjeevikarthik.kuruganti\[at\]gmail.com](mailto:chiranjeevikarthik.kuruganti[at]gmail.com)

Abstract: *Nail biting, lip biting, skin biting and skin picking differ in how they are defined, measured and treated. This systematic review examined their prevalence, emotional processes, impairment and behavioural interventions. Five Europe PMC searches on 11 October 2026 covered English-language, open-access MEDLINE/PubMed records published through 30 April 2026. The searches yielded 390 record appearances and 325 unique records. Of 177 retrieved full texts, 111 initially met broad criteria; a disclosed post hoc refinement retained 45 empirical reports. Seven background sources were considered separately. A repeat search on 20 October reproduced the retrieval totals and located all 45 included reports. Narrative synthesis showed that prevalence depended strongly on sampling and diagnostic thresholds. Emotional difficulties, sensory cues and automaticity were associated with skin picking, although findings did not support a single causal explanation. Controlled behavioural interventions showed benefits in particular nail-biting, skin-picking and mixed-behaviour samples. Evidence specific to lip biting and skin biting remained largely descriptive. Single-source retrieval, access restrictions, post hoc selection and AI-assisted assessment without independent duplicate review limit the conclusions. No new meta-analysis was undertaken.*

Keywords: body-focused repetitive behaviours, skin picking, nail biting, emotion regulation, habit reversal training

1. Introduction

Body-focused repetitive behaviours (BFRBs) are recurrent actions directed towards the body that may cause tissue damage, distress or difficulty in daily functioning. Their significance depends on frequency, loss of control, consequences and context. An occasional habit and a clinically impairing disorder cannot be treated as equivalent observations. Emotion-regulation models propose that these behaviours can persist because they alter unpleasant feelings or tension, but sensory reinforcement and habitual action may also contribute [1].

This review addresses nail biting, lip biting, skin biting and skin picking. Onychophagia denotes habitual nail biting [2]. Morsicatio labiorum describes lip-mucosal changes caused by repetitive biting, chewing or sucking; a lesion described under this term does not itself establish a psychiatric disorder [3]. Dermatophagia and dermatodaxia have both been used for skin biting, with dermatodaxia avoiding an assumption that bitten skin is swallowed [4]. Skin-picking disorder (SPD), also termed excoriation disorder, concerns recurrent picking associated with damage, unsuccessful attempts to stop, and distress or impairment.

These distinctions affect interpretation of prevalence. In a survey of 4,335 college students, 59.55% reported occasional subclinical BFRBs and 12.27% met the study's criteria for a pathological BFRB. The estimates covered several behaviours, including cheek biting, and therefore cannot be used as the prevalence of any one behaviour examined here [5]. A useful synthesis must retain each study's population, behavioural definition and method of assessment.

2. Literature Survey

Previous reviews provide context for the present comparison. Farhat et al. synthesised 19 studies involving 38,038 participants and estimated an excoriation-disorder prevalence of 3.45% (95% confidence interval 2.55-4.65%). Their eligibility criteria allowed different definitions and assessments of the disorder [6]. This published pooled estimate is background evidence; it was not recalculated in the present review.

Barber and Fitzgerald's review of 19 studies found greater emotion-regulation difficulties in people with SPD than in controls. Associations with overall symptom severity were mixed, and emotional dysregulation was more closely associated with focused than automatic picking [7]. Lee et al. identified ten randomised trials of habit reversal within obsessive-compulsive-related disorders, comprising eight studies of hair pulling and two of excoriation behaviour. Their appraisal identified weaknesses in trial methods and reporting [8]. Neither review establishes an equivalent evidence base for lip biting or skin biting.

Clinical observations also indicate unmet need. Among 262 adults assessed in person for SPD, stress and skin texture were frequent triggers and 87.1% had never received treatment [9]. Such selected clinical samples describe burden and service use, but cannot estimate prevalence in the general population.

3. Problem Definition

The literature is distributed across psychology, psychiatry, dermatology and dentistry. Studies variously describe a reported habit, a physical lesion, questionnaire symptoms or a diagnosed disorder. This review asks how the four target

behaviours compare in prevalence and demographic patterns, emotional and habitual processes, impairment, comorbidity, help seeking and intervention evidence. It also examines the limits of transferring findings between behaviours. Hair pulling was not an independent target; mixed samples were retained when at least one target behaviour was represented.

4. Methodology

4.1 Design and information source

A systematic literature review with narrative synthesis was undertaken. PRISMA 2020 informed reporting of retrieval and selection [10]. A working protocol preceded the original searches but was not externally registered. The eligibility criteria were subsequently narrowed after the initial broad selection, as described below. This amendment was post hoc.

Europe PMC was searched on 11 October 2026. Retrieval was limited to English-language, open-access records from its MEDLINE/PubMed source, with first publication dates on or before 30 April 2026 and no lower date limit. The publication cutoff retained the scope of the preliminary project; it was distinct from the later retrieval date. PsycINFO, Scopus, Web of Science and Google Scholar were not systematically searched.

Seven sources from the preliminary literature review supplied background and were kept outside the empirical count: Roberts et al., Halteh et al., Houghton et al., Lee et al., Grant and Chamberlain's 262-adult study, Farhat et al., and Barber and Fitzgerald [1], [2], [5], [6], [7], [8], [9]. Their retention was not a systematic citation-chaining procedure.

4.2 Search terms and reproducibility

Five searches covered the target behaviours and the umbrella term BFRB. The historical literal query strings were not available for the manuscript. The syntax below was reconstructed from the recorded term groups and limits and rerun on 20 October 2026. It reproduced the five reported counts, the total of 325 unique records, and retrieval of all 45 included empirical reports. This check verified retrieval and inclusion-list membership; it did not provide independent duplicate screening.

Each expression below was combined with the same Europe PMC filters: SRC:MED AND OPEN_ACCESS:Y AND LANG:eng AND FIRST_PDATE:[* TO 2026-04-30].

Nail biting: (TITLE_ABS:onychophagia OR TITLE_ABS:"nail biting" OR TITLE_ABS:nailbiting OR TITLE_ABS:"nail-biting") - 109 records.

Lip biting: (TITLE_ABS:"morsicatio labiorum" OR TITLE_ABS:"lip biting" OR TITLE_ABS:"lip-biting" OR TITLE_ABS:"lip chewing" OR TITLE_ABS:"lip-chewing") - 41 records.

Skin biting: (TITLE_ABS:dermatophagia OR TITLE_ABS:dermatodaxia OR TITLE_ABS:"skin biting" OR TITLE_ABS:"skin-biting") - 5 records.

Skin picking: (TITLE_ABS:"excoriation disorder" OR TITLE_ABS:dermatillomania OR TITLE_ABS:"skin picking" OR TITLE_ABS:"skin-picking") - 155 records.

Umbrella terms: (TITLE_ABS:"body focused repetitive" OR TITLE_ABS:"body-focused repetitive" OR TITLE_ABS:BFRB) - 80 records.

The searches returned 390 overlapping record appearances. Deduplication by source and record identifier removed 65 duplicate appearances. The acronym BFRB also retrieved unrelated biomedical records, which were assessed against the topic criteria.

4.3. Eligibility and selection

The focused synthesis included peer-reviewed human research primarily addressing target-behaviour prevalence, demographic patterns, emotional processes, episode context, general clinical burden, comorbidity, help seeking, or controlled behavioural and psychological interventions. Mixed-BFRB studies were eligible when they explicitly included a target behaviour. Oral-habit surveys were retained for separable lip-biting findings. Clinically informative lip- and skin-biting cases were eligible because dedicated research on these behaviours was sparse.

Initial exclusions covered reviews without original participant data, opinion articles, protocols without results, unrelated behaviours, inseparable syndrome-related self-injury, accidental injury and unavailable full texts. The later refinement excluded instrument-development reports, isolated neural or sensory tasks without direct emotional or treatment outcomes, peripheral trait or single-comorbidity studies, and samples selected primarily for another diagnosis. Medication, neuromodulation and uncontrolled intervention reports were outside the focused treatment synthesis, apart from the stated descriptive case exception. This narrowing creates a risk of selection bias because it followed inspection of the evidence.

Titles and available abstracts were screened, and ambiguous records advanced to full-text assessment. Of 325 unique records, 147 were excluded and 178 reports were sought. XML full texts were obtained through Europe PMC for 177 reports; one was unavailable. Initial full-text assessment excluded 66 reports and retained 111. The post hoc refinement excluded another 66, leaving 45 empirical reports. Correction notices were not counted as independent studies. The original screening totals are retained; the later reference verification did not reconstruct every excluded record's decision.

4.4 Extraction appraisal and synthesis

Extraction covered bibliographic details, target behaviour, sample, design, definition, comparator, assessment period, findings and interpretive limitations. Appraisal considered sampling, measurement and confounding in observational work; allocation, comparison groups, attrition and follow-up in interventions; and clinical context and limits of generalisation in case reports and qualitative research. These were descriptive judgements, not formal RoB 2, JBI or GRADE assessments.

Screening, extraction, appraisal and report preparation were AI-assisted and were not independently duplicated by a

second reviewer. During manuscript preparation, all 53 references were matched to bibliographic records. Relevant findings were checked in 47 available full texts and, for six background sources without accessible full texts, their indexed abstracts. Verification included the funding correction linked to Alamer et al.; it did not alter that study's reported findings. This source check reduces transcription errors but does not resolve selection bias or replace independent appraisal.

The synthesis grouped evidence by behaviour and research question. Different prevalence definitions, comparators and outcomes were kept separate. No new meta-analysis, pooled participant total or treatment ranking was calculated. Potentially overlapping cohorts were not treated as assuredly independent replications. The review used published literature and involved no participant recruitment or collection of identifiable clinical records.

5. Results and discussion

5.1 Study Selection and Evidence Distribution

Figure 1 summarises selection. The 45 empirical reports included surveys, clinical associations, retrospective records, repeated assessments, a qualitative study, a laboratory comparison, controlled interventions and four lip- or skin-biting case reports or series. Nine reports compared behavioural or psychological interventions: eight used randomised intervention or experimental designs, and one programme was described by its authors as quasi-experimental. Skin picking accounted for much of the mechanistic and clinical evidence. Dedicated skin-biting research was particularly limited.

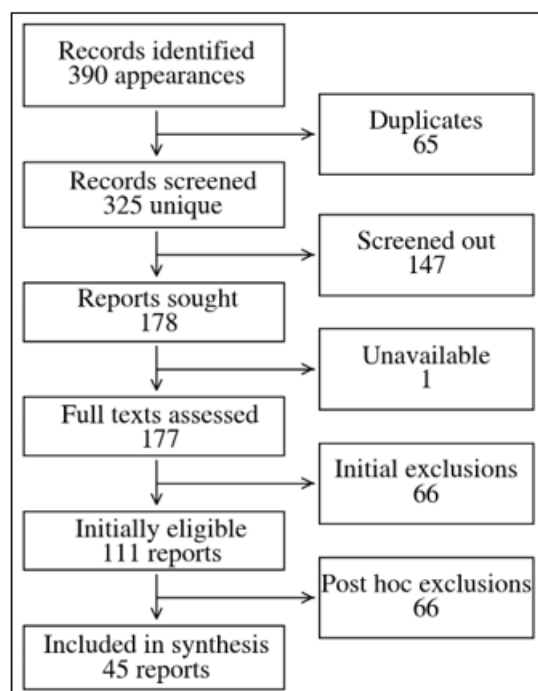


Figure 1: Study selection including the post hoc refinement

5.2 Prevalence and demographic patterns

Table 1 illustrates why prevalence estimates cannot be combined indiscriminately. Nail biting was reported in

22.3% of 743 Iranian primary-school children over the previous three months [11], compared with current self-reported onychophagia in 57.3% of 330 Egyptian medical students [12]. These are different populations and observation periods; neither figure alone establishes a rate of clinically impairing nail-biting disorder.

Table 1: Selected prevalence estimates in their measurement context

Sample and source	Definition and estimate
743 schoolchildren in Iran [11]	Parent-reported nail biting during the preceding three months: 22.3%.
330 medical students in Egypt [12]	Current self-reported onychophagia: 57.3%.
500 preschool children in India [13]	Caregiver-reported lip-biting habit: 13.4%.
10,169 adults in a US online panel [14]	Self-reported SPD: 2.1% current; 3.1% lifetime.
520 adults in Jeddah [15]	Any skin picking: 28.8%; SPS-R threshold symptoms: 1.2%.
740 Saudi adults [16]	Study-defined BFRBs: 29.1%; picking: 13.4%; nail biting: 4.3%.
210 medical students in Karachi [17]	Study-defined BFRBs: 22%; picking: 9.0%; nail biting: 6.2%.

The US study used an online convenience panel with demographic characteristics intended to resemble the population [14]. The Jeddah study's contrast between any picking and threshold symptoms demonstrates the importance of case definition [15]. The Saudi survey required study-defined frequency, duration and consequence criteria [16]; the Karachi survey used frequency and duration rules [17]. These percentages should not be presented as interchangeable estimates of formally diagnosed disorder.

For lip biting, Dhull et al. reported a habit in 13.4% of 500 preschool children [13]. Hegde and Xavier screened 2,636 schoolchildren, of whom 526 had recorded adverse oral habits; their habit-specific percentages used that subgroup as the denominator [18]. A Turkish study compared 345 children of multiple births with 345 singletons and recorded age-specific lip-biting differences [19]. These studies establish occurrence in their samples, not the prevalence of clinically impairing morsicatio labiorum. Almutairi et al.'s combined lip/object-biting item cannot supply a separate lip-biting estimate [20]. No dedicated community estimate of skin biting was identified in the included reports.

Demographic findings also depended on recruitment and outcome. In 95 adults with SPD, men and women did not differ significantly in severity, disability or quality of life [21]. In a mixed sample of 539 adults with hair-pulling or skin-picking disorders, participants classified by the study as belonging to minority ethnic groups reported more time spent on the behaviour and less previous treatment [22]. These selected samples support further investigation of access and presentation, without establishing population-wide differences.

5.3 Emotional processes sensory cues and automaticity

Emotional processes were associated with BFRBs, but their direction and strength varied. In an Indian school study, 21 students with BFRBs had higher state and trait anxiety scores

than 21 matched controls [23]. Retrospective accounts in Gallinat et al.'s survey described boredom, tension or negative feelings before picking, positive feelings or reduced awareness during episodes, and shame or guilt afterwards [24]. Such reports are compatible with emotion-regulation explanations, although recall-based associations do not demonstrate causal reinforcement.

Pozza et al.'s community study of 285 participants linked different emotion-regulation difficulties to picking dimensions [25]. Repeated surveys by Kłosowska and Prochwicz found that cognitive reappraisal was negatively associated with focused picking across measurement periods, while its association with automatic picking changed during the pandemic [26]. Prochwicz et al. found that negative affectivity moderated the relationship between self-reported attentional control and focused picking [27]. These results concern questionnaire associations and do not establish that improving one measured process will necessarily reduce the behaviour.

Momentary assessment provides a closer view of episodes. Across ten days, 57 participants in Gallinat et al.'s study reported 1,467 picking episodes. Visual or tactile cues and a desire to pick were more prominent in focused episodes; boredom and concentration difficulties were more prominent in automatic episodes. Tension did not clearly distinguish the two styles [28]. In contrast, Huang et al.'s study of 83 adults found that subtype groups did not consistently differ in emotional regulation or neurocognitive performance, although focused picking was associated with greater impairment [29]. Mixture modelling in a separate multicentre sample identified distinct symptom profiles, but did not test whether those profiles predicted treatment response [30].

Measurement also changed the apparent emotional relationship. In a one-week study of 143 participants, self-reported and performance-based emotional granularity were essentially uncorrelated ($r = 0.01$) and showed different associations with picking [31]. A case-control study of 45 people with SPD and 47 controls found selective differences in facial emotion recognition, rather than impairment across all emotions [32]. Qualitative interviews with 17 UK participants described circumstances that permitted picking, absorption or escape, and shame about its visibility [33]. Together, these studies suggest several interacting processes; they do not identify one universal mechanism.

Null findings are relevant to that interpretation. Egyptian medical students with and without nail biting did not differ significantly in perceived stress [12]. In 169 children receiving dental care, the assessed oral habits were not associated with dental anxiety or cooperation [34]. Dental anxiety is a specific outcome and cannot represent every form of anxiety, but this result argues against assuming that nail biting necessarily signals elevated anxiety.

5.4 Impairment comorbidity and help seeking

Clinical burden extended beyond visible injury. Grant and Chamberlain's study of 125 adults linked SPD severity with impulsivity, anxiety and related clinical features [35]. In a mixed study of 98 participants, disability was associated with picking severity, perceived stress and comorbid disorders,

among other variables [36]. These findings favour assessment of functioning and associated difficulties, while their observational designs leave the direction of influence unresolved.

Service-use findings indicated gaps between symptoms and care. In Kwon et al.'s review of 250 patients with excoriation disorder, fewer than half received psychiatric referrals and most referred patients lacked documented follow-up [37]. The paper gives different referral percentages in its abstract and results, so a single exact percentage is not used here. In a Canadian review of 83 patients, 41% had a recorded return appointment; follow-up outside the hospital was not known [38]. Among 675 patients with self-induced nail disorders, 19.1% had sought medical treatment for their nails [39]. A physician survey also found inconsistent enquiry about nail biting [40].

Comorbidity estimates were strongly affected by setting. Ghanizadeh's study described substantial psychiatric comorbidity among children with nail biting who attended a mental-health clinic; those rates cannot be transferred to community nail biters [41]. A pandemic survey of 460 people reporting BFRBs found treatment interruption in 55 of the 145 receiving active treatment [42]. It documents reported disruption in a self-selected sample, rather than proving a general pandemic effect. Comparable evidence on impairment and service use specifically for lip biting and skin biting remained sparse.

5.5 Behavioural and psychological interventions

The controlled studies evaluated different treatment components, formats and endpoints. In a trial of 91 children and adolescents, habit reversal training (HRT) and object manipulation improved nail length compared with a waiting list after one month. HRT showed an advantage over object manipulation in the later nail-length comparison. The active groups were followed for three months, whereas waiting-list follow-up lasted one month [43]. This supports a specific behavioural intervention finding, but unequal observation periods limit broader comparisons.

Two self-help studies examined mixed BFRBs. Moritz et al.'s trial of 113 participants compared HRT, decoupling and decoupling in sensu. Completion and response patterns differed, with no untreated comparison group [44]. Their subsequent trial of 334 participants compared sequences of the three techniques with a waiting list. Intention-to-treat effects on BFRB severity were $d = 0.52$ - 0.54 [45]. These findings do not establish the effect size for each individual behaviour, particularly lip biting or skin biting.

For skin picking, the 12-week SaveMySkin trial randomised 133 participants and reported greater improvement in the primary severity score than a waiting list ($d = 0.67$). Only 65.4% completed the post-assessment, and secondary outcomes did not show clear between-group benefits [46]. Xavier et al. randomised 54 patients to individual or group cognitive-behavioural therapy (CBT) after a separate 16-person pilot. Reported remission was 63% and 52%, respectively, with no statistically significant difference between formats. Both groups received active treatment, so

this comparison does not isolate benefit relative to no treatment [47].

Other controlled approaches produced narrower findings. Expressive writing in 132 women reduced immediate picking urges and focused-picking scores over two weeks compared with control writing [48]. In 57 women, both soft-touch training and progressive muscle relaxation reduced SPD severity, without a significant group-by-time effect on that outcome [49]. A 45-participant approach-avoidance experiment changed proximal urges or task responses, but found no significant between-group difference in skin-picking severity at two-week follow-up [50]. These results should not be converted into claims of established superiority over HRT or CBT.

Rashwan et al.'s programme for 135 children reported improvements in nail-biting practice, knowledge, attitudes and self-efficacy compared with routine care [51]. The authors described the design as quasi-experimental while also reporting random assignment, and the trial was registered retrospectively. Its results are therefore presented separately from more clearly characterised randomised trials. Across the intervention literature, differences in comparators, attrition, follow-up and outcome measures prevent a defensible treatment ranking.

5.6 Direct evidence for lip biting and skin biting

Four case reports or series contributed clinical descriptions. Kang et al.'s three lip cases showed how habitual injury can resemble other mucosal disorders [3]. Raaj et al. described a lip scar treated with excision and counselling-related advice; multiple concurrent measures and the absence of a comparison prevent attribution of improvement to a particular psychological intervention [52]. Cohen's adult patient recognised his skin biting and declined intervention [4]. Perti et al.'s child case described skin biting and nail biting but reported no return for follow-up after medication was prescribed [53]. These accounts assist recognition and illustrate clinical context. They cannot establish prevalence or treatment effectiveness.

5.7 Interpretation and limitations

The review supports keeping behavioural occurrence, tissue injury and clinically significant impairment separate. Emotional difficulty is one plausible contributor, especially in skin picking, but sensory cues, automaticity and attention also matter. Correlations and retrospective relief reports cannot establish a causal mechanism. Controlled findings support particular short-term behavioural approaches in the samples studied; extrapolation to lip biting or skin biting remains uncertain.

The main review limitations concern coverage and selection. A single indexed source and English-language, open-access restrictions can miss relevant evidence. The April 2026 publication cutoff also means that the review is not a synthesis of all literature available by October 2026. Search terms were not developed through a librarian-reviewed controlled-vocabulary strategy. The later reconstructed queries reproduced the retrieval totals but do not replace the

missing historical strings or a complete report-level exclusion log.

Post hoc eligibility refinement may have influenced the composition of the final corpus. Some topic boundaries, such as general emotional processes versus a specific associated condition, required judgement. AI-assisted assessment without independent duplicate review increases the possibility of missed or inconsistently classified evidence. Descriptive appraisal provides less structured assurance than a formal risk-of-bias assessment. Possible cohort overlap, selective reporting and publication bias were not quantified. Accordingly, the absence of a study type in this corpus should be interpreted as a gap in the retrieved evidence, rather than proof that no such study exists.

6. Conclusion

The 45 empirical reports show that the four target behaviours have uneven evidence bases. Prevalence depends on who is studied and how the behaviour is defined. Emotional processes are relevant, but the findings do not support a single explanation for all BFRBs. Specific behavioural interventions show short-term benefits for nail biting, skin picking and mixed samples, while direct controlled evidence for lip biting and skin biting remains limited. These conclusions should be read within the review's restricted retrieval, post hoc selection and appraisal limitations.

7. Future scope

Further work should distinguish habits from disorders using consistent definitions and representative sampling, particularly for lip biting and skin biting. Repeated assessments can clarify whether emotional changes precede or follow episodes. Trials need appropriate comparison groups, longer follow-up, functional outcomes and clear reporting of adherence and adverse events. An updated review with broader database coverage, archived screening decisions and independent assessment would allow a stronger test of the patterns identified here.

8. Use of AI tools

AI tools assisted the original review's screening, extraction, descriptive appraisal and writing. ChatGPT was used to adapt the research report into this manuscript and to assist bibliographic and source verification. These procedures were not independent human duplicate review. The author remains responsible for the manuscript and its submission.

References

- [1] Roberts S, O'Connor K, Bélanger C. Emotion regulation and other psychological models for body-focused repetitive behaviors. *Clin Psychol Rev*. 2013;33(6):745-762. doi:10.1016/j.cpr.2013.05.004.
- [2] Halteh P, Scher RK, Lipner SR. Onychophagia: A nail-biting conundrum for physicians. *J Dermatolog Treat*. 2017;28(2):166-172. doi:10.1080/09546634.2016.1200711.

- [3] Kang HS, Lee HE, Ro YS, Lee CW. Three cases of 'morsicatio labiorum'. *Ann Dermatol.* 2012;24(4):455-458. doi:10.5021/ad.2012.24.4.455.
- [4] Cohen PR. Skin Biter: Dermatodaxia Revisited. *Cureus.* 2022;14(2):e22289. doi:10.7759/cureus.22289.
- [5] Houghton DC, Alexander JR, Bauer CC, Woods DW. Body-focused repetitive behaviors: More prevalent than once thought? *Psychiatry Res.* 2018; 270: 389-393. doi:10.1016/j.psychres.2018.10.002.
- [6] Farhat LC, Reid M, Bloch MH, Olfson E. Prevalence and gender distribution of excoriation (skin-picking) disorder: A systematic review and meta-analysis. *J Psychiatr Res.* 2023; 161: 412-418. doi:10.1016/j.jpsychires.2023.03.034.
- [7] Barber KE, Fitzgerald JM. Emotion regulation deficits in skin picking (excoriation) disorder: A systematic review. *J Affect Disord.* 2025; 388: 119500. doi:10.1016/j.jad.2025.119500.
- [8] Lee MT, Mpavaenda DN, Fineberg NA. Habit Reversal Therapy in Obsessive Compulsive Related Disorders: A Systematic Review of the Evidence and CONSORT Evaluation of Randomized Controlled Trials. *Front Behav Neurosci.* 2019; 13: 79. doi:10.3389/fnbeh.2019.00079.
- [9] Grant JE, Chamberlain SR. Characteristics of 262 adults with skin picking disorder. *Compr Psychiatry.* 2022; 117: 152338. doi:10.1016/j.comppsy.2022.152338.
- [10] Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021; 372: n71. doi:10.1136/bmj.n71.
- [11] Ghanizadeh A, Shekoochi H. Prevalence of nail biting and its association with mental health in a community sample of children. *BMC Res Notes.* 2011; 4: 116. doi:10.1186/1756-0500-4-116.
- [12] Mohammad AMA, Hammad RAAE, Elghazally NM. Prevalence and correlates of onychophagia among Egyptian medical students: a cross-sectional study. *Discov Ment Health.* 2025;5(1):195. doi:10.1007/s44192-025-00327-x.
- [13] Dhull KS, Verma T, Dutta B. Prevalence of Deleterious Oral Habits among 3- to 5-year-old Preschool Children in Bhubaneswar, Odisha, India. *Int J Clin Pediatr Dent.* 2018;11(3):210-213. doi:10.5005/jp-journals-10005-1513.
- [14] Grant JE, Chamberlain SR. Prevalence of skin picking (excoriation) disorder. *J Psychiatr Res.* 2020; 130: 57-60. doi:10.1016/j.jpsychires.2020.06.033.
- [15] Khatib HA, Alghamdi WA, Subki AH, Butt NS, Alsallum MS, Alsulaimani AS, et al. Prevalence of and Risk Factors for Skin Picking Disorder Symptoms Among Adults in an Arab Middle Eastern Population: A Cross-Sectional Study. *Clin Cosmet Investig Dermatol.* 2022; 15: 2583-2591. doi:10.2147/ccid.s348258.
- [16] Alamer SA, Alturaiki HM, AlSaad AJ, Mousa AMA, Almutairi AA, Al-Sindi ZS, et al. Prevalence of body-focused repetitive behaviors among the general population of Saudi Arabia: a cross-sectional study. *Front Psychiatry.* 2026; 17: 1704330. doi:10.3389/fpsy.2026.1704330.
- [17] Siddiqui EU, Naeem SS, Naqvi H, Ahmed B. Prevalence of body-focused repetitive behaviors in three large medical colleges of Karachi: a cross-sectional study. *BMC Res Notes.* 2012; 5: 614. doi:10.1186/1756-0500-5-614.
- [18] Hegde AM, Xavier AM. Childhood Habits: Ignorance is not Bliss- A Prevalence Study. *Int J Clin Pediatr Dent.* 2009;2(1):26-29. doi:10.5005/jp-journals-10005-1037.
- [19] Oz E, Kirzioğlu Z. The contribution of genetics to dental caries, oral habits and occlusal traits in Turkish twins: A comparative study. *BMC Oral Health.* 2023;23(1):735. doi:10.1186/s12903-023-03426-9.
- [20] Almutairi AF, Albeshar N, Aljohani M, Alsinanni M, Turkistani O, Salam M. Association of oral parafunctional habits with anxiety and the Big-Five Personality Traits in the Saudi adult population. *Saudi Dent J.* 2021;33(2):90-98. doi:10.1016/j.sdentj.2020.01.003.
- [21] Grant JE, Chamberlain SR. Skin picking disorder: Does a person's sex matter? *Ann Clin Psychiatry.* 2022;34(1):15-20. doi:10.12788/acp.0049.
- [22] Grant JE, Valle S, Aslan IH, Chamberlain SR. Clinical presentation of body-focused repetitive behaviors in minority ethnic groups. *Compr Psychiatry.* 2021;111:152272. doi:10.1016/j.comppsy.2021.152272.
- [23] Saily S, Khanande RV, Munda SK, Mehta VS. Body-focused repetitive behaviors in school-going children and adolescents and its relationship with state-trait anxiety and life events. *Indian J Psychiatry.* 2020;62(6):703-706. doi:10.4103/psychiatry.indianjpsychiatry_607_19.
- [24] Gallinat C, Stürmlinger LL, Schaber S, Bauer S. Pathological Skin Picking: Phenomenology and Associations With Emotions, Self-Esteem, Body Image, and Subjective Physical Well-Being. *Front Psychiatry.* 2021; 12: 732717. doi:10.3389/fpsy.2021.732717.
- [25] Pozza A, Giaquinta N, Dèttore D. Borderline, avoidant, sadistic personality traits and emotion dysregulation predict different pathological skin picking subtypes in a community sample. *Neuropsychiatr Dis Treat.* 2016; 12: 1861-1867. doi:10.2147/ndt.s109162.
- [26] Kłosowska J, Prochwicz K. Cognitive reappraisal and types of skin picking - A longitudinal study with pre-pandemic and COVID-19 pandemic data. *J Obsessive Compuls Relat Disord.* 2021; 28: 100614. doi:10.1016/j.jocrd.2020.100614.
- [27] Prochwicz K, Antosz-Rekucka R, Kałużna-Wielobób A, Sznajder D, Kłosowska J. Negative Affectivity Moderates the Relationship between Attentional Control and Focused Skin Picking. *Int J Environ Res Public Health.* 2022;19(11):6636. doi:10.3390/ijerph19116636.
- [28] Gallinat C, Moessner M, Wilhelm M, Keuthen N, Bauer S. Patterns of Skin Picking in Skin Picking Disorder: Ecological Momentary Assessment Study. *Interact J Med Res.* 2024; 13: e53831. doi:10.2196/53831.
- [29] Huang A, Collins M, Grant JE. Focused and automatic subtypes of skin picking disorder. *CNS Spectr.* 2025;30(1):e91. doi:10.1017/s1092852925100667.

- [30] Grant JE, Peris TS, Ricketts EJ, Lochner C, Stein DJ, Stochl J, et al. Identifying subtypes of trichotillomania (hair pulling disorder) and excoriation (skin picking) disorder using mixture modeling in a multicenter sample. *J Psychiatr Res.* 2021; 137: 603-612. doi:10.1016/j.jpsychires.2020.11.001.
- [31] Wabnegger A, Schienle A. Comparison of Self-Reported and Performance-Based Emotional Granularity in Relation to Skin-Picking Behavior: An Experience Sampling Study. *Eur J Investig Health Psychol Educ.* 2025;15(10):204. doi:10.3390/ejihpe15100204.
- [32] Ergelen M, Taşloğlu Sayiner AC, Çırakoğlu M, Yalçın M. Emotion recognition deficits in patients with skin picking disorder: the role of alexithymia while controlling depression, and anxiety levels. *Front Psychiatry.* 2025; 16: 1597268. doi:10.3389/fpsyt.2025.1597268.
- [33] Anderson S, Clarke V, Thomas Z. The problem with picking: Permittance, escape and shame in problematic skin picking. *Psychol Psychother.* 2023;96(1):83-100. doi:10.1111/papt.12427.
- [34] Taravati S, Ataiean F, Mofradnejad S, Rakhshan V. Risk factors for dental anxiety and cooperativeness in pediatric patients with or without oral habits (bruxism, nail biting, and thumb sucking). *BMC Oral Health.* 2025;25(1):786. doi:10.1186/s12903-025-06169-x.
- [35] Grant JE, Chamberlain SR. Clinical correlates of symptom severity in skin picking disorder. *Compr Psychiatry.* 2017; 78: 25-30. doi:10.1016/j.comppsy.2017.07.001.
- [36] Grant JE, Aslan IH, Chamberlain SR. Statistical predictors of psychosocial impairment in body-focused repetitive behaviors. *CNS Spectr.* 2022;27(5):621-625. doi:10.1017/s1092852921000468.
- [37] Kwon C, Sutaria N, Khanna R, Almazan E, Williams K, Kim N, et al. Epidemiology and Comorbidities of Excoriation Disorder: A Retrospective Case-Control Study. *J Clin Med.* 2020;9(9):2703. doi:10.3390/jcm9092703.
- [38] Deschênes L, Veillette H. Skin Picking Disorder: A Canadian Retrospective Study of 83 Patients. *J Cutan Med Surg.* 2025;29(3):268-273. doi:10.1177/12034754241303119.
- [39] Güldiken Doğruel G, Atış G, Esen M, Ulutaş Demirbaş G, Gündoğan Ö, Demirbaş A, et al. Self-Induced Nail Disorders: Clinical and Demographical Features. *Int J Dermatol.* 2025;64(8):1409-1415. doi:10.1111/ijd.17781.
- [40] Lesinskiene S, Pociute K, Dervinyte-Bongarzone A, Kinciniene O. Onychophagia as a clinical symptom: A pilot study of physicians and literature review. *Sci Prog.* 2021;104(4):00368504211050288. doi:10.1177/00368504211050288.
- [41] Ghanizadeh A. Association of nail biting and psychiatric disorders in children and their parents in a psychiatrically referred sample of children. *Child Adolesc Psychiatry Ment Health.* 2008;2(1):13. doi:10.1186/1753-2000-2-13.
- [42] Pathoulas JT, Olson SJ, Idnani A, Farah RS, Hordinsky MK, Widge AS. Cross-sectional survey examining skin picking and hair pulling disorders during the COVID-19 pandemic. *J Am Acad Dermatol.* 2021;84(3):771-773. doi:10.1016/j.jaad.2020.11.011.
- [43] Ghanizadeh A, Bazrafshan A, Firoozabadi A, Dehbozorgi G. Habit Reversal versus Object Manipulation Training for Treating Nail Biting: A Randomized Controlled Clinical Trial. *Iran J Psychiatry.* 2013;8(2):61-67. PMID: 24130603.
- [44] Moritz S, Penney D, Ahmed K, Schmotz S. A Head-to-Head Comparison of Three Self-Help Techniques to Reduce Body-Focused Repetitive Behaviors. *Behav Modif.* 2022;46(4):894-912. doi:10.1177/01454455211010707.
- [45] Moritz S, Penney D, Bruhns A, Weidinger S, Schmotz S. Habit Reversal Training and Variants of Decoupling for Use in Body-Focused Repetitive Behaviors. *A Randomized Controlled Trial. Cognit Ther Res.* 2023;47(1):109-122. doi:10.1007/s10608-022-10334-9.
- [46] Gallinat C, Moessner M, Haenssle HA, Winkler JK, Backenstrass M, Bauer S. An Internet-Based Self-Help Intervention for Skin Picking (SaveMySkin): Pilot Randomized Controlled Trial. *J Med Internet Res.* 2019;21(9):e15011. doi:10.2196/15011.
- [47] Xavier ACM, de Souza CMB, Flores LHF, Bermudez MB, Silva RMF, de Oliveira AC, et al. Skin picking treatment with the Rothbaum cognitive behavioral therapy protocol: a randomized clinical trial. *Braz J Psychiatry.* 2020;42(5):510-518. doi:10.1590/1516-4446-2019-0636.
- [48] Schlintl C, Schienle A. Reduction of Pathological Skin-Picking Via Expressive Writing: A Randomized Controlled Trial. *Clin Psychol Eur.* 2023; 5(2): e11215. doi:10.32872/cpe.11215.
- [49] Schienle A, Schlintl C, Wabnegger A. A neurobiological evaluation of soft touch training for patients with skin-picking disorder. *Neuroimage Clin.* 2022; 36:103254. doi:10.1016/j.nicl.2022.103254.
- [50] Mathew AS, Rech MA, Lee HJ. Evaluating the role of Approach-Avoidance Training on action-tendencies in individuals with skin-picking disorder: A preliminary randomized experiment. *J Behav Addict.* 2021;10(3):827-838. doi:10.1556/2006.2021.00031.
- [51] Rashwan ZI, Darweesh HAM, Elsobky FA, Amer SAM, Nada MAA. BASNEF behavioral transformation: effect of empowerment program on children's knowledge, attitude, self-efficacy, and practice of nail biting. *BMC Pediatr.* 2025;25(1):312. doi:10.1186/s12887-025-05450-w.
- [52] Raaj V, Anbuselvan GJ, Salam S, Sivagami M, Yamunadevi A, Priyadarshini K, et al. Lip Biting Scar and its Treatment - A Rare Case Report. *J Pharm Bioallied Sci.* 2023;15(Suppl 1):S797-S798. doi:10.4103/jpbs.jpbs_16_23.
- [53] Perti A, Chaudhury S, Javadekar A, Ghosh P. Dermatodaxia or compulsive skin biting. *Ind Psychiatry J.* 2025;34(2):358-359. doi:10.4103/ipj.ipj_122_24.