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Review

Clinical Patterns and Treatment Outcomes of Patients with Chronic Lip-Biting Habits

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Abstract

Lip-biting is a common oral habit that has been observed in both children and adults. It can be classified into habitual, compulsive, and accidental. Chronic lip-biting is associated with various lesions, such as ulcers and mucoceles. It can be caused by psychological or somatic conditions. Repeated lip-biting results in a chronically traumatized area that may be scarred, thickened, and paler than the surrounding mucosa. Previous studies have focused on the treatment of lesions caused by lip-biting habits rather than lip-biting itself. This review aims to discuss clinical patterns of chronic lip-biting habits and their treatment outcomes. Chronic or habitual lip-biting has been mostly found as a habit that was acquired during childhood and exacerbated in stressful situations. It was also found in patients with depression who weren't even aware of it. These cases present with oral lesions that cannot be healed due to chronic lip-biting habits. Accidental lip-biting mainly occurs following dental procedures as a result of anesthesia. Treatment of chronic lip-biting includes encouragement and counseling, cognitive behavioral therapy, and functional oral appliances. Future studies should highlight the importance of management of chronic lip-biting habits before the development of oral lesions, as this will improve the quality of life of these cases and reduce their burden.

Keywords: *Lip-biting, chronic lip-biting, habitual lip-biting, clinical patterns*

Introduction

Habit is the frequent repetition of a mental experience leading to a behavior pattern that has become nearly or completely involuntary (1). Oral habits are common and associated with various side effects, such as dentoalveolar deformities and oral mucosa lesions (2). Moreover, they may lead to ulcers, callosities, malocclusion, dental caries, and periodontal diseases (3). Oral habits can be learned (or acquired), compulsive, or accidental. Acquired oral habits are habits learned during childhood that can be easily stopped as age increases, while compulsive oral habits are habits that individuals resort to in stressful situations as a reaction to reduce this stress (4). Finger sucking is the most common oral habit, followed by tongue thrusting. Other habits include mouth breathing, nail biting, and bruxism. It should be noted that any habit should be evaluated for frequency, duration, and intensity (4).

Chronic biting of oral mucosa, or morsicato mucosae oris, is a form of factitial/unintentional injury that is observed commonly on the buccal and labial mucosa and lateral surface of the tongue (5, 6). It has been estimated that 750 out of every one million have a chronic biting of oral mucosa habit with females affected more compared to males (7). Habitual or chronic lip-biting is a common oral habit caused by various psychogenic and somatic conditions (8, 9). Typically, it is an unconscious psychogenic habit, which can be considered a mild form of self-mutilation that arises as a behavior aimed at drawing attention from family members or caregivers or as a response to oral stimuli (5). It may even be precipitated by traumatic injury.

Chronic lip-biting has been observed in adults and children. In children, it is mainly transient and stops with time; however, lip-biting may be aggravated in periods of stress such as school examinations, competition in sports, and other activities (6). In certain individuals, habitual lip-biting develops into a persistent neurosis, with the intensity and frequency of the behavior closely linked to the level of experienced stress. Repeated chronic lip-biting results in a chronic traumatized area that may be scarred, thickened, and paler than the surrounding mucosa (5). It may also lead to white frayed or macerated surfaces, which may be tender or edematous in some cases. There are various oral conditions that mimic biting lesions, such as chronic allergic contact stomatitis, genetic mucosal diseases like white sponge nevus, and smokeless tobacco lesions (6).

Various lesions due to chronic lip-biting habits have been reported by previous studies; however, these studies focused primarily on managing the lesions rather than addressing the underlying chronic lip-biting habit. This review aims to investigate the clinical patterns of chronic lip-biting habits introduced in current literature and to evaluate different treatment plans for these habits and their outcomes.

Methods

A comprehensive literature search was conducted in Medline (via PubMed), Scopus, and Web of Science databases up to September 15, 2025. Medical Subject Headings (MeSH) and relevant free-text keywords were used to identify synonyms. Boolean operators (AND', OR') were applied to combine search terms in alignment with guidance from the Cochrane Handbook for Systematic Reviews of Interventions. Key search terms included: "Chronic lip-biting" AND "Clinical patterns" AND "Treatment outcomes". Summaries and duplicates of the found studies were exported and removed by EndNoteX8. Any study that discusses the clinical patterns and treatment outcomes of patients with chronic lip-biting habits and published in peer-reviewed journals was included. All languages are included. Full-text articles, case series, and abstracts with the related topics are included. Case reports, comments, animal studies and letters were excluded.

Discussion

Oral Habits

Oral habits can be classified into acquired oral habits, compulsive oral habits, and accidental oral habits. Acquired oral habits are learned habits during childhood that could be easily stopped while growing up (4). Compulsive oral habits are fixed

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habits that individuals resort to in stressful situations and preventing them from these habits makes them anxious and worried (4). Oral habits include thumb sucking, nail biting, bruxism, and lip-biting.

Thumb sucking is the most common oral habit, whose prevalence decreases with age until it stops, in most cases, by the age of four (10). Prolonged finger sucking can lead to various side effects, such as anterior open bite (11), increased overjet (11), lingual inclination of lower incisor and labial inclination of upper incisor, posterior crossbite (12, 13), compensatory tongue thrust (12, 13), deep palate, speech defect (14), and finger defects (e.g., eczema of the finger) (15). No treatment for dental changes is required if this habit is stopped before the age of five, as these dental changes will resolve spontaneously (13, 16). If thumb sucking doesn't stop by the age of five, multiple approaches could be tried, such as direct interview with the child (10, 16), encouragement (10, 14), reward system (10), reminder therapy (10, 16), and orthodontic appliance. A pacifier is used to prevent thumb sucking in many countries; however, its use after the age of three can lead to harmful effects on dentition development (4).

Nail biting is another common oral habit among children. It usually starts after the age of three or four and peaks at the age of 10. Nail biting is a usual response to psychological disorders; some children may transition from thumb sucking to nail biting as they grow older. Complications of nail biting include resorption of tooth root (17), anterior teeth malocclusion, alteration of oral colonization by Enterobacteriaceae (18), intestinal parasitic infections (19), and bacterial infection and alveolar destruction (20). Notably, it was reported that 25% of patients with temporomandibular joint pain and dysfunction have nail-biting habit (21).

Clinical Patterns of Lip-Biting

Habitual lip-biting

A case reported by Amal et al. (2024) presented with a lower lip mucocele due to lip-biting (22). The patient was a 13-year-old male who presented with a painless growth on the lower lip that has shown periodic regression and enlargement over the past two years (22). A composite diastema was used to help stop the lip-biting habit, then the lesion was excised using a 940 nm diode laser excision. The wound healed without complications, and no occurrence was observed after 3 months of clinical follow-up (22). Kannan et al. (2024) also reported a case of mucocele due to lip-biting in the lower lip of a 17-year-old female (23). The patient visited the dental clinic complaining of the chief complaint of a swelling on her lower lip for the past month. She further stated that she bit her lower lip frequently, especially when she was studying. The lesion was a well-defined, soft, and dome-shaped swelling measuring about 1.4 x 1.1 cm. The entire lesion was excised along with the associated minor salivary gland to prevent recurrence (23).

Cohen (2022) reported a case of an 80-year-old woman who presented with an asymptomatic acquired lesion on her lower lip of two-year duration, which then was diagnosed as biting fibroma (24). The patient recalled the unintentional biting of her lip at this location. The lesion was a painless, smooth, firm, flesh-colored, 3x3 millimeter papule on the mucosal portion of the lower lip, just left of the midline. The microscopic evaluation of the excision biopsy showed collagenous fibrous tissue with vessels in the lamina propria. Recurrence of the lesion did not occur, and the biopsy site completely healed by second intention (24).

Bhatia et al. (2013) reported two cases of habitual biting of oral mucosa (5). One of them was a 7-year-old boy with chronic lip-biting, which led to edematous growth on the left side of his lower lip. The growth started two months before the presentation to the dental clinic. Notably, the patient experienced trauma in his lower lip, after which lip-biting increased (5). The treatment plan focused on stopping the lip-biting habit by using habit-breaking appliances. The appliance consisted of a soft polyvinyl sheet of 2 mm thickness, which was molded in vacuum-formed pressure molding device on the maxillary arch cast (Bioplast® Scheu Dental GmbH Iserlohn, Germany). Wearing this appliance

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led to significant progressive regression of the lesion (5).

Karaçay et al. (2006) reported a case of a 10-year-old female with ulceration at the left corner of her lower lip and buccal mucosa (25). Although the patient was unaware of having a lip-biting habit and denied that the wound was self-inflicted, it was thought that the patient had a self-inflicted wound on the lower lip caused by the maxillary and mandibular primary canines (25). This can be explained by the depression and uncommunication that the patient experienced after the divorce of her parents. In order to treat the biting habit, a modified fixed-lip bumper appliance was installed. Primary healing of lip ulceration occurred within 2 weeks, and complete healing occurred after 1 month (25). This is similar to the case reported by Raaj et al. (2023), where a young 29-year-old male presented with whitish swelling at the left lower lip due to a lip-biting habit. The patient was not aware of this habit due to his depressive state (2).

Fukumitsu et al. (2003) reported two cases of children with lip-biting and lip-sucking that led to maxillary protrusion with a deep bite (26). The frontal view of the first case, who was a 4-year-old girl, showed a symmetrical face with a clear habit of lip-biting and lip-sucking. The profile view showed a protrusive upper lip and retruded chin with mentalis strain upon lip closure. Her cephalometric analysis showed labial tipping of the upper deciduous central incisors, low mandibular angle, and mandibular retrognathism (26). A functional appliance was used to stimulate forward mandibular growth, reduce the flaring of the upper deciduous central incisors, and help stop the lip-biting habit. This led to elimination of the lip-biting habit, which resulted in, along with stimulation of forward mandibular growth, favorable jaw and incisor relationships with satisfactory forward mandibular growth (26). Summary of reported clinical patterns of chronic lip-biting is shown in **Table 1**.

Table 1. Reported Clinical Patterns of Chronic Lip-Biting

Author	Age/Gender	Lesion	Etiology	Treatment
Amal et al. (2024) (22)	13 years old male	Mucocele, recurrent swelling	Habitual lip biting	Diode laser excision + composite diastema correction
Kannan et al. (2024) (23)	17 years old female	Soft, dome-shaped swelling (1.4 × 1.1 cm)	Habitual lip biting during study stress	Surgical excision with minor salivary gland removal
Cohen (2022) (24)	80 years old female	Firm, flesh-colored fibroma (3×3 mm)	Repeated unintentional lip-biting	Excision biopsy
Bhatia et al. (2013) (5)	7 years old male	Edematous growth post-trauma	Chronic habitual lip biting	Soft polyvinyl mouthguard appliance
Karaçay et al. (2006) (25)	10-year-old female	Ulceration at the corner of the lip	Lip biting due to emotional distress (parental divorce)	Modified lip bumper appliance
Raaj et al. (2023) (2)	29-year-old male	Whitish swelling	Lip biting due to a depressive state	Surgical excision
Fukumitsu et al. (2003) (26)	4-year-old female	Protrusive upper lip, deep bite	Lip sucking/biting with malocclusion	Functional appliance + exercises

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Accidental lip-biting

Tiwari (2023) reported a case of a four-year-old child complaining of a white, uncomfortable patch on her lower lip two days after composite restoration (27). They believed that accidental lip-biting occurred following topical anesthesia and led to traumatic ulcers. The treatment plan included daily applications of ice packs and saline rinses, as well as acetaminophen oral suspension. After 10 days, the lesion was fully recovered. Besides instructions to the parents and child themself, the study recommended that dentists should put a cotton roll in the vestibule to separate the lip from the teeth (27). Chi et al. (2008) reported a similar case of a 10-year-old boy who presented with swelling of the lower lip due to accidental lip-biting after receiving a right inferior alveolar nerve block and three dental restorations (28).

Furthermore, lip-biting led to an ulcer of the mucosa of the lower lip in a 37-year-old woman in a case reported by Becker et al. (2008). The ulcer remained unhealed for 10 days, which was believed to be due to self-administration of metamizole, a highly potent analgesic drug, which led to agranulocytosis that stopped the ulcer from healing (29). The treatment plan involved isolation, broad-spectrum antibiotics, triple use of granulocyte growth factor, as well as local povidone iodine to treat the ulcer. After a week, the ulcer had completely healed (29).

Treatment of Chronic Lip-Biting

Anybody-focused repetitive behavior (BFRB), such as lip-biting, can be treated by various modalities (9). Cognitive behavioral therapy (CBT) has been the treatment of choice for any BFRB (30-32). Third-wave CBT treatments, including mindfulness and acceptance and commitment therapy (ACT), also have a role in the management of BFRB (31). Specifically, habit reversal training has shown favorable outcomes in the treatment of trichotillomania or skin picking (33, 34). Habit reversal training includes different components, such as awareness training and competing response training (35). The latter involves a static "freezing" of an alternative/incompatible behavior (e.g., clenching the fist for some time, spreading the fingers like a hand fan, gripping an object tightly).

The decoupling technique is another technique developed to treat BFRB; it is available in five languages (English, German, Farsi, Russian, and Slovak) and can be downloaded from the internet at no cost. This technique has shown effectiveness in the treatment of nail biting and trichotillomania (36-38). The decoupling technique involves two phases. The first phase is to encourage the participants to observe and learn the behavioral pattern that precedes the abnormal habit for a period of time without any intervention; then they are instructed to perform a movement that resembles the initial behavioral sequence of the habit (9). The second phase is to encourage them to redirect the movement, shortly before the undesired habit, with an accelerated hand movement to another part of the body or a particular point in the room away from the body (9). This may lead to an irritation that may reach consciousness, helping the participant to intervene and prevent the BFRB.

Multiple treatment methods for chronic or habitual lip-biting are available, including encouraging the patient to stop the habit by counseling, relaxation techniques, and sedatives (5); targeting the habit and protection of the mucosa from injury by oral appliances like various types of removable shields that protect the tongue (39), lips (40), and cheek mucosa (41); selective occlusal grinding of the sharp edges of teeth (42); and extracting the offending teeth in case of extreme conditions (43). Fukumitsu et al. (2003) summarized the treatment methods of lip-biting in children that have been described in the literature (26). These methods involved reminding the child of the habit to help them stop it; lip exercises to strengthen the orbicularis oris and retrocline the upper incisors; the utilization of an oral screen as a lip exerciser or a reminder of the habit; and using an orthodontic appliance, such as a lip bumper.

Clinical Implications

Chronic lip-biting has various clinical patterns and can lead to different oral lesions. Treatment of lip-biting habits should be an essential part of the

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treatment plan for oral lesions. Multiple studies reported that treating this habit significantly improved treatment outcomes. The majority of chronic lip-biting cases are of a psychological or habitual etiology. This underlines the importance of psychological support and care for these cases, especially children. Furthermore, caregivers should be attentive to any signs of lip-biting in their children, as this habit often develops during childhood and may persist or recur during periods of stress. Using appliances to help stop lip-biting habits, such as lip bumper, has shown effectiveness. Other more recent methods include cognitive behavioral therapy and the decoupling technique, which have shown favorable outcomes.

Conclusion

Chronic lip-biting habits have different clinical patterns with different causes, severity, age of presentation, and complications. These habits can be acquired, compulsive, or accidental and have been observed in various age groups. Oral lesions caused by chronic lip-biting include ulcers, mucoceles, and biting fibromas. Encouraging and counseling, functional oral appliances, lip exercises, and cognitive behavioral therapy are treatment methods for chronic lip-biting, and all have shown effectiveness. Future studies should highlight the importance of management of chronic lip-biting habits before the development of oral lesions, as this will improve the quality of life of these cases and reduce their complications burden.

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Conflict of interest

There is no conflict of interest.

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Data availability

Data that support the findings of this study are embedded within the manuscript.

Author contribution

All authors contributed to conceptualizing, data drafting, collection and final writing of the manuscript.

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