

Review Article

Therapeutic effects of Chamomilla extract in oral diseases- A Systematic Review

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ABSTRACT:

Background: Oral diseases are among the most prevalent diseases globally, greatly reducing the quality of life for those affected. The most prevalent oral diseases globally are dental caries, periodontal disease, tooth loss, and cancers of the lip and oral cavity. The extract of Chamomilla is being used against various skin and oral diseases. The aim was to assess the therapeutic effects of Chamomilla on oral diseases. **Materials and Methods:** A Search was conducted using Pub med, Google scholar, Science direct and Research gate using MeSH terms- chamomile, oral mucositis, periodontitis, xerostomia, gingivitis, minor aphthous stomatitis. A total of 278 articles were screened, 30 out of 278 were full-text articles and were assessed for eligibility and 4 articles were used in this systematic review. **Results:** Chamomilla Recutita extract had various therapeutic effects against oral diseases such as chronic periodontitis, oral aphthous ulcers, oral mucositis and recurrent aphthous stomatitis. **Conclusion:** Chamomilla Recutita extract showed a good prognosis when used in the treatment of various oral diseases.

Keywords: Chamomilla Recutita, chronic periodontitis, recurrent aphthous stomatitis, oral mucositis, mouthwash, topical gel.

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INTRODUCTION

Chamomile (*Chamomilla Recutita*) is a herb that is best known for its anti-inflammatory, anti-fungal and antibacterial action. It has been used to treat many oral and skin diseases like minor aphthous ulcers, xerostomia and in the treatment of lichen planus. Mucositis is a harmful side effect of chemotherapy; it causes mucosal damage in the oral cavity and some areas of GIT.^[1] Some herbal mouthwashes are being used as an alternative to scaling and root planning in treating periodontal diseases. Periodontitis is caused due to the inflammation of the periodontium. The removal of bacterial plaque is important and is necessary for reducing the development of periodontal diseases. Chamomile mouthrinse showed good results in oral mucositis, recurrent stomatitis and plaque accumulation.^[2] Recurrent aphthous stomatitis is a common lesion of the mucosa. It shows a female predilection and usually appears in childhood and adolescence. According to certain studies, the anti-

inflammatory mechanism of flavonoids in chamomile plays an essential role in healing ulcers.^[3] The study was done to examine the effect of the health indicators and the human development index on the global misery index.^[4] It was done to examine the studies which are based on the implementation of machine and deep learning in dentistry.^[5] Oral mucositis is one of the side effects of chemotherapy in patients who undergo stem cell transplantation. Components of *Matricaria Recutita* such as flavonoids, spiro ethers, chamazulene and bisabolol oxides A and B have pharmacological actions such as anti-viral, antibacterial, anti-ulcer and wound healing effects.^[6] Oral stomatitis is a common inflammatory complication in patients undergoing radiation therapy. Stomatitis can cause discomfort, pain and dysphagia which can lead to nutritional deficiency. Radiotherapy can affect any mucosal cells but it most commonly occurs in the oral cavity and small intestine. *Chamomilla Recutita* is an ancient medicine that has

been used in Egyptian civilisations and has now found a place even in modern medicine. It has been proved that Chamomilla Recutita soothed the pain in patients undergoing radiotherapy.^[7] Chamomilla Recutita has an antimicrobial, antioxidant and significant anti-platelet action. In an in-vitro study, it has been proved that chamomile reduced cell viability by an average of 36% and an in-vivo study proved that chamomile acts as an excellent healing agent for ulcers when compared to corticosteroids.^[8]

Burning Mouth Syndrome (BMS) is a painful condition that may affect the tongue, lips, gums and mucosa. Chamomile with its anti-inflammatory, analgesic and antibacterial activity is used to treat BMS^[9]. Xerostomia is a condition that causes dryness of the mouth due to diminished function of the salivary glands due to ageing, disease, drug reaction, etc. The effect of chamomile extract in protecting the oral mucosal lesions showed relief of oral discomfort and mucositis.^[10] The objective of this study is to assess the effective therapeutic use of Chamomilla extract in oral diseases.

MATERIALS AND METHODS
ELIGIBILITY CRITERIA

INCLUSION CRITERIA

- Randomised control trials which had been done in the recent decade.
- Free and full-text articles from the search engines like pub med, google scholar, science direct and research gate.
- Articles consisting of the elaboration of Chamomilla extract as one of the therapeutic agents for oral diseases.

EXCLUSION CRITERIA

- Studies without randomised control trials.
- Articles where Chamomilla tincture extract was not used for the treatment of oral diseases.

SEARCH STRATEGY

Published literature is based on the therapeutic use of Chamomilla in the treatment of oral diseases including original articles and research papers from pub med, google scholar, science direct and research gate were included in the study.

RESULTS

[Figure 1] The search resulted in 278 articles and out of which 30 were full-text articles which were assessed for eligibility. At last, 4 articles were used in this systematic review.

Figure 1: Flow chart showing the number of studies identified, screened, assessed for eligibility, excluded and included in the systematic review.

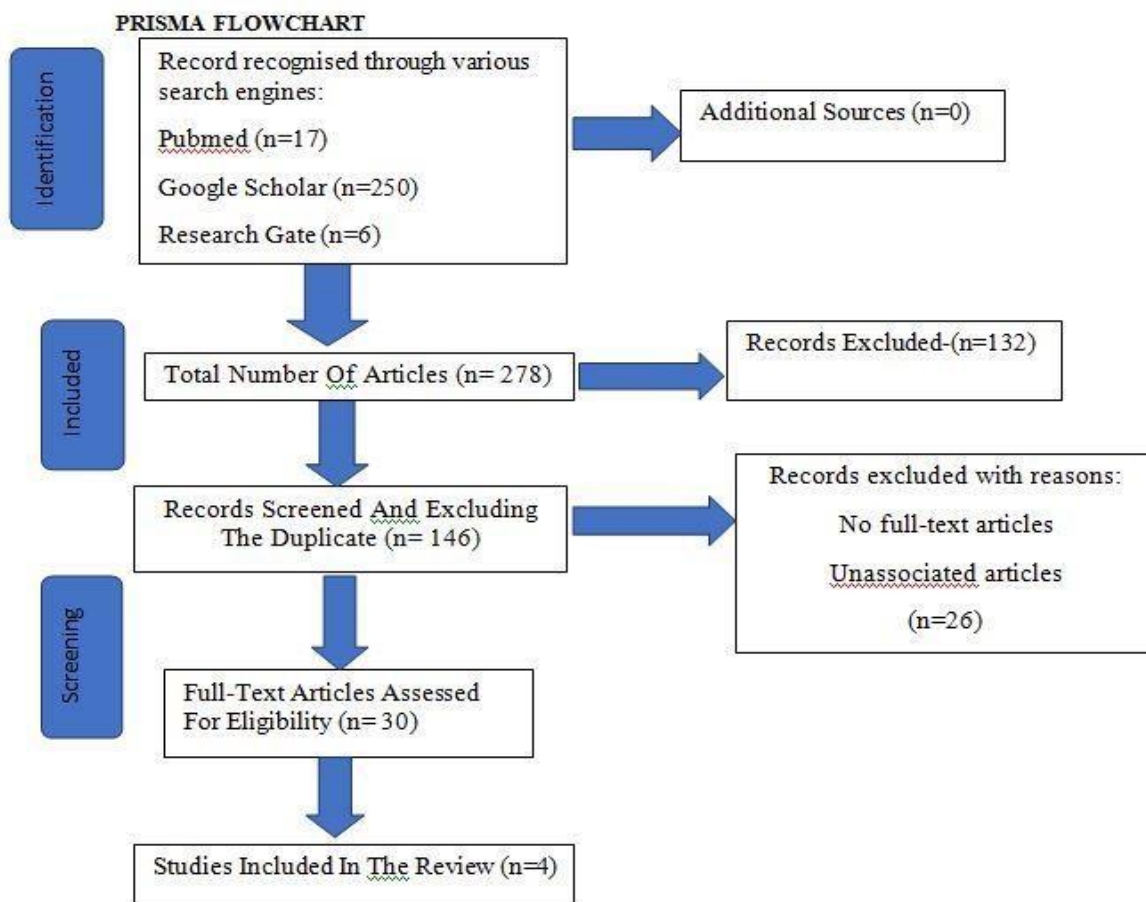


Table I: Characteristics Of Interventions In The Study

S.no	Author name	Year	Sample size	Patient characteristics	Duration	Interventions
1.	Mahmoud Ahmed Elhadad et. al., ^[1]	2022	45	Patients aged 30 years and above who were planned to receive chemotherapy for head and neck cancers	3 weeks	Group 1- antifungal agents, topical anaesthetics and anti-inflammatory agents. Group 2- chamomile topical oral gel 3% alone. Group 3- chamomile topical gel along with conventional symptomatic treatment.
2.	Ashish Agarwal and Bharti Chaudhary ^[2]	2020	75 (39 males and 36 females)	Patients aged 30-65 years with previously untreated generalised chronic periodontitis, having a minimum of 15 teeth, probing pocket depth between 5 and 7mm, and CAL between 5 and 10mm and presence of bleeding on probing.	3 months	Group 1- Scaling and root planning + placebo mouth rinsing. Group 2- Scaling and root planning+ 0.12% CHX mouth rinsing. Group 3-Scaling and root planning + 1% Matricaria chamomile mouth rinse
3.	Andishe Tadbir, A., et. al., ^[3]	2015	45	Patients aged 18-60 years with Pain intensity, size of the ulcer, days to complete resolving of the ulcer and satisfaction of the patient.	6 days	GROUP O- Oro base only. GROUP T – Triamcinolone in Oro base. GROUP C- Chamomile in Oro base.
4.	MariaTavakoli Ardakani,et. al., ^[4]	2015	70	Patients aged 15 years and above who are non-smokers, development of oral mucositis with pain, dryness of the oral cavity, dysphagia and alternation in taste sensation	7 days	Group 1 – placebo or herbal mouthwash 3 times daily after each meal. Group 2- treatment group.

Table I shows the characteristics of the studies included in the systematic review. In all 4 studies, chamomile was used in different forms in the treatment of various oral diseases, all the studies differ in the age of the patients, sample numbers and duration of the outcome.

Table II: Characteristics Of The Primary Outcome And Results Of The Studies Included In The Systematic Review

S.no	Authors name	Year	Effect measure	Result
1.	Mahmoud Ahmed Elhadad, et. al., ^[1]	2022	The pain severity was assessed using the Numeric Rating Scale from 0-10 as NRS=0(no pain) NRS=1-3(mild pain) NRS=4-6(moderate pain) NRS=7-10(severe pain). Patients were instructed to report the current intensity of pain over the past 7 days with 0 indicating no pain and 10 as worst pain which was noted every week for 3 weeks.	The study showed that the use of topical chamomile 3% gel lowered the severity of mucositis with lower pain sores developed during chemotherapy.

2.	Ashish Agarwal and Bharti Chaudhary ^[2]	2020	In each study group, descriptive statistics were analysed, and the normality was assessed using the Shapiro-Wilk test. At different time intervals, the Friedman test was used to compare the periodontal parameters within each of the study groups. Krystal-Wallis ANOVA was used for intergroup comparison.	The use of MTC mouth rinse showed good results against chronic periodontitis and was more effective than chlorhexidine mouthwash. MTC mouth rinse can be used as a potential therapeutic agent for chronic periodontitis.
3.	Andishe Tadbir, A., et. al., ^[3]	2015	The intensity of pain was evaluated based on a 10-point VAS system in which 0 indicated mildest pain and 10 as worst pain. The treatment was evaluated as quite satisfied, satisfied and dissatisfied on the patient's review.	This study determined that the use of chamomile Oro base for aphthous ulcers significantly reduces pain intensity but could not completely resolve symptoms as early as triamcinolone.
4.	Maria Tavakoli Ardakani, et. al., ^[4]	2015	In this study, the National Cancer Institute Common Toxicity Criteria Mucositis scale was used to measure the severity of oral mucositis daily and the severity was evaluated using a Numerical Rating Scale from 0-10	There was a significant decrease in the level of pain, xerostomia, and dysphagia in herbal mouthwash.

Table II shows the characteristics of the primary outcome and result of the studies included, a progressive decrease in aphthous ulcers, mucositis and periodontitis with the use of Chamomile extract with a notable p-value.

Table III: Bias Analysis As Included In The Studies

S.no	Authors name and year	Random sequence generation	Allocation concealment	Blinding of outcome	Incomplete outcome data	Blinding participants and personal	Selective reporting
1.	Mahmoud Ahmed Elhadad, et. al., ^[1]	+	?	-	+	?	+
2.	Ashish Agarwal and Bharti Chaudhary et.al., ^[2]	+	-	-	+	-	+
3.	Tadbir, A., et. al., ^[3]	+	-	-	+	-	+
4.	MariaTavakoli Ardakani, et. al., ^[4]	+	-	-	+	-	+

Table III shows the bias analysis of the included studies and all the studies included had a positive outcome
+ = low risk of bias, - = high risk of bias, ? = unclear risk of bias

DISCUSSION

Matricaria chamomilla (synonym- Matricaria Recutita) commonly known as chamomile has been used in herbal remedies for thousands of years. Chamomile was used medicinally in ancient Egypt and Classical Antiquity. More than 120 chemical constituents are found in the flowers of chamomile. It contains therapeutically active compounds such as flavonoids, coumarins etc. In this systematic review,

all four articles showed a positive outcome of Chamomilla Recutita in the treatment of oral diseases like periodontitis, oral mucositis and Recurrent Aphthous Stomatitis which positively supported the study for systematic review. Mahmoud Ahmed Elhaddad et al reported that topical chamomile 3% gel lowered the severity of mucositis and lowered the pain in patients undergoing chemotherapy. This study used chamomile in the form of gel along with

Carbopol 945 and Hydroxypropyl methylcellulose (HPMC) these have the advantage to turn semisolids into a solid state which provides adhesion to the buccal tissues. Carbopol and HPMC were used with 0 concentration and Chamomile gel was used at a concentration of 3%, the gel was prescribed 3 times per day. All the patients who were treated with chamomile reported none to mild pain during a 3-week follow-up.^[1] Ashish Agarwal and Bharti Chaudhary reported that MTC mouth rinse showed good results against chronic periodontitis, and was more effective than chlorhexidine mouthwash in the treatment of chronic periodontitis, due to its antioxidant, anti-inflammatory and its superior healing properties. The results showed that both CHX and MTC had similar advantages in the reduction of PPD, CAL, GI and PI after 3 months of baseline period but 0.12% CHX rinse had a post-operative change of tooth colour.^[2]

Azadeh Andisheh Tadbir et al reported that Chamomile could reduce the pain intensity similar to triamcinolone in Recurrent Aphthous Stomatitis, Chamomile reduced the size of the ulcer on day 3 similar to triamcinolone but on day 6 triamcinolone was superior to chamomile in reducing the size and therefore triamcinolone showed complete resolution of symptoms earlier than chamomile. Patient satisfaction in this experiment was nearly the same with triamcinolone and chamomile Oro base. Therefore, the study showed that chamomile could not resolve symptoms of RAS completely as triamcinolone but reduced the intensity of pain and gave patient satisfaction.^[3] Maria Tavakoli Ardakani et al reported that *Matricaria Recutita* can reduce the severity of mucositis and could prevent further infections that aggravate oral mucositis it also showed to reduce dysphagia in patients due to its anti-inflammatory effects.^[4] Braga FT et.al, Initially, patients with oral mucositis present with erythema, oedema and a burning sensation which then in subsequent stages results in ulcerative lesions, pain, dysphagia and bleeding. The extract of *Chamomilla Recutita* has proved to inhibit the production of interleukin-6 and cyclooxygenase-2.^[9]

Machado PV et.al, reported that patients with acute lymphocytic leukaemia presenting with severe oral mucositis after application of *Chamomilla Recutita* cream following laser therapy showed full recovery with considerable regression of the lesion.^[10] Braga AS et.al, reported that dental caries produce a carcinogenic biofilm by the acidogenic and aciduric bacteria, in particular, *S.mutans* can rapidly produce virulent biofilm by the production of insoluble extracellular polysaccharides in the extracellular matrix. *Matricaria chamomilla* has a good antimicrobial effect against *S.aureus*, *Candida albicans*, *Salmonella typhi* and *Escherichia coli*.^[11] Nashat E et.al, reported that Oral lichen planus which causes a burning sensation, pain and several other discomforts can be treated with *Chamomilla*, which

can also be used in its malignant transformation.^[12] Batista AL et.al, reported that Chamomile can be used in the treatment of gingivitis as they contain active flavonoids as well as volatile oils rich in terpenoids which constitute anti-inflammatory, antispasmodic and antibacterial activity.^[13]

Pourdeghahtkar F et.al, reported that oral mucositis is observed during the treatment of cancer such as transplantation of hematopoietic fundamental cells, and chemotherapy and is generally caused due to consumption of drugs such as 5-fluorouracil methotrexate and cytarabine. Chamomile has properties such as anti-spasm and anti-fungal antibodies which when used as a mouthwash prevents oral mucositis in children with acute lymphoblastic leukaemia^[14]. Pourabbas R et.al, reported that Chamomile when used in combination with other herbal mouthwash or dentifrice, showed a reduction in plaque growth and improvement in gingival health.^[15]

CONCLUSION

Matricaria Chamomilla can be used in the treatment of Oral diseases like Chronic periodontitis, Recurrent Aphthous Stomatitis, Oral Aphthous Ulcers and Oral Mucositis with positive outcomes.

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Nil

CONFLICT OF INTEREST

Nil

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