

## REVIEW OF POLYHERBAL MOUTHWASHES AND THEIR IMPACT ON ORAL HEALTH: HERBAL SYNERGY IN DENTISTRY

Addanki Anusha<sup>\*1</sup>, T. Kavya<sup>2</sup>, T. Divya<sup>2</sup>, S. Sushmitha<sup>2</sup>, T. Saiteja<sup>2</sup>

<sup>1</sup>Bharat Institute of Pharmacy, (Approved by PCI New Delhi, AICTE and affiliated to JNTUH) Mangalpally (V),  
Ibrahimpattam, R.R Dist., Telangana-501510.

<sup>2</sup>Bharth School of Pharmacy, (Approved by PCI New Delhi, AICTE and affiliated to JNTUH) Mangalpally (V),  
Ibrahimpattam, R.R Dist., Telangana-501510.

Article Received: 01 June 2026 | Article Revised: 22 June 2026 | Article Accepted: 13 July 2026

**\*Corresponding Author: Addanki Anusha**

Bharat institute of pharmacy, (Approved by PCI New Delhi, AICTE and affiliated to JNTUH) Mangalpally (V), Ibrahimpattam, R.R Dist.,  
Telangana-501510. DOI: <https://doi.org/10.5281/zenodo.21704251>

**How to cite this Article:** Neela Madhav S., Mahesh Reddy G., Deepak M., Dr. Praveen K. R., Ajay Kumar S. N., Dr. E. Gopinath (2026)  
RESOLUTION PHARMACOLOGY IN CHRONIC KIDNEY DISEASE: ROLE OF LIPID MEDIATORS IN TISSUE REPAIR. World Journal  
of Pharmaceutical Science and Research, 5(8), 163-170.



Copyright © 2026 Addanki Anusha | World Journal of Pharmaceutical Science and Research.

This work is licensed under creative Commons Attribution-NonCommercial 4.0 International license (CC BY-NC 4.0).

### ABSTRACT

Oral hygiene is essential for the preservation of overall health, and mouthwashes are a valuable supplement to mechanical cleansing methods like flossing and brushing. Modern mouthwashes have evolved from traditional herbal rinses to modern formulations that incorporate synthetic agents, alcohol, and, more recently, polyherbal blends. This progression has occurred over time. This review offers a thorough examination of polyherbal mouthwashes, with an emphasis on their historical development, classification, relevance to oral anatomy, and role in the prevention and management of oral infections. The discussion emphasises the mechanisms of action, which include antimicrobial, anti-inflammatory, antioxidant, and plaque-control properties, that render botanical formulations appealing alternatives to conventional products. Special emphasis is placed on the synergy of multiple plant extracts, which optimises therapeutic efficacy while minimising adverse effects. Nanotechnology-based delivery systems, evidence-based clinical trials, and alcohol-free formulations are also examined in the context of recent advancements in mouthwash technology. This review emphasises the potential of polyherbal mouthwashes in treating common oral conditions, including gingivitis, periodontitis, halitosis, and fungal infections, by incorporating insights from oral anatomy and pathology. The article concludes by identifying future directions, such as the necessity of rigorous clinical validation, personalised oral care, and sustainable formulations. In general, polyherbal mouthwashes are a promising frontier in dentistry, as they integrate traditional knowledge with contemporary scientific innovation to encourage safe, effective, and comprehensive oral hygiene.

**KEYWORDS:** Mouthwash, Polyherbal, Dental Hygiene, Oral Infections, Anatomy.

## 1. INTRODUCTION

A dosage form is a pharmaceutical product's physical presentation that includes an active pharmaceutical ingredient (API) at a predetermined dose together with additional excipients or additives. These dose forms are meant to give the patient the medication in a convenient, safe, and efficient manner.<sup>[1,2]</sup> Because dosage form design directly affects drug efficacy, patient compliance, and overall therapeutic results, it is crucial to pharmaceutical formulations. The medicine's pharmacokinetics and pharmacodynamics are influenced by the dosage form that is selected, which also impacts how the drug is delivered, absorbed, and distributed throughout the body. For a medication to be safe, stable, and able to produce the intended therapeutic effect, proper dosage form design is essential. When designing dosage forms, the administration route is a key consideration.<sup>[3-5]</sup>

### 1.1 Dosage forms

Drug molecules are delivered to the body's areas of action via dosage forms, which maximise intended effects and minimise side effects. Excipients and active pharmaceutical ingredients are combined to create dosage formulations.

$$\text{API} + \text{EXCIPIENTS} = \text{DOSAGE FORM}$$

Chemical substances used in illness diagnosis, treatment, and prevention are known as active pharmaceutical ingredients. Drug or other active chemicals are transported by excipients, which are inactive substances. Preservatives, colouring, and flavouring agents are a few examples.

## 2. CLASSIFICATION OF DOSAGE FORMS

Dosage form classification Dosage forms, which include solid dosage forms (tablets, capsules), liquid dosage forms (solutions, suspensions), semisolids (ointments, creams), and novel delivery systems (liposomes, nanoparticles) investigated in terms of their benefits, drawbacks, and suitability for various therapeutic applications, exhibit diversity in their structures and mechanisms of drug forms based on their characteristics.

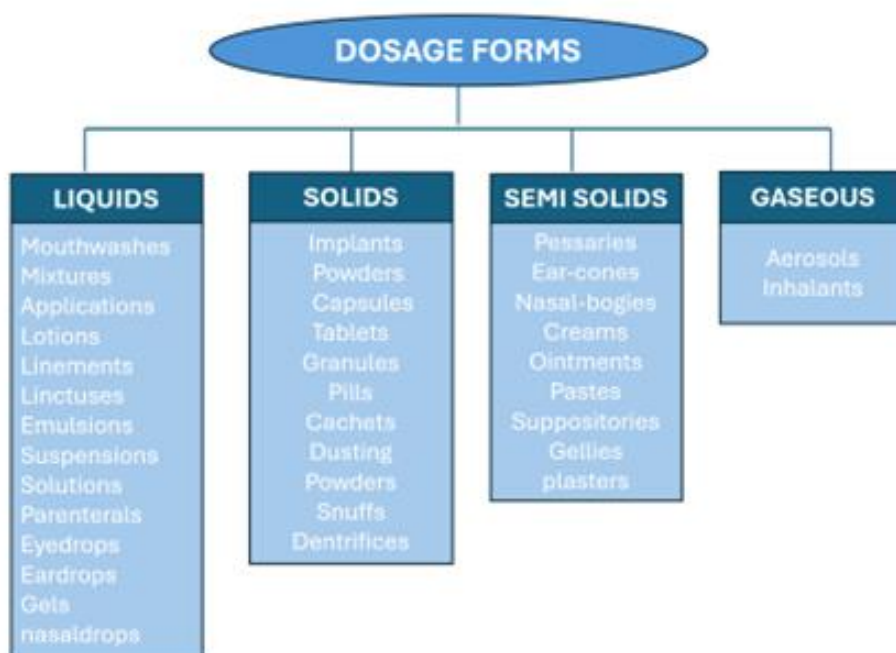


Fig No 1: Classification of dosage forms.

### 1.3 LIQUID ORAL DOSAGE FORMS

Pharmaceutical preparations known as liquid dosage forms are made by combining an active medication with non-active ingredients like solvents and additives.<sup>[6]</sup> Although liquid oral dosage forms have benefits including dose flexibility and ease of swallowing for kids, they could need additives that aren't kid-friendly. Due to safety concerns or possible negative effects, several substances or excipients that are frequently used in liquid formulations—such as alcohol, artificial sweeteners, or specific preservatives—might not be appropriate for young children.<sup>[7]</sup>

### 1.4 LIQUID ORAL DOSAGE FORMS CLASSIFICATION

They are frequently divided into two main categories: monophasic and biphasic formulations, each of which has a number of dose forms. There is only one phase in monophasic liquids (such as syrups, elixirs, linctuses, etc.). Conversely, two different phases are present in the formulation of biphasic liquids. (For instance, emulsion, suspension).<sup>[8]</sup>

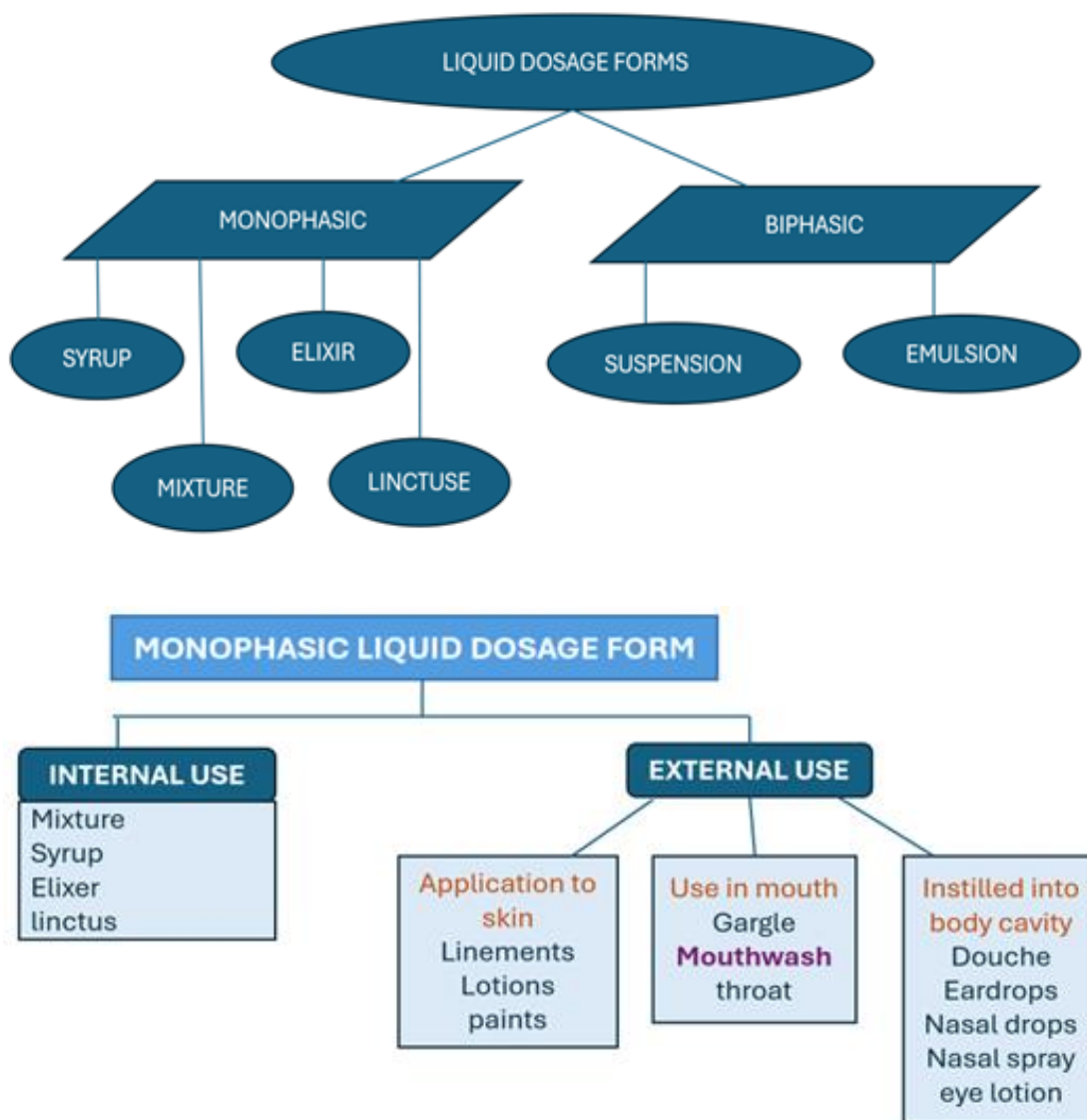


Fig. 2: Classification of liquid oral dosage form.

### 1.5 MOUTHWASHES

It could be advised to use a mouthwash to cure infections, relieve discomfort and inflammation, lessen halitosis, or apply fluoride topically to prevent cavities. Mouthwash is used therapeutically to suppress or eliminate plaque-associated microorganisms, and it is mostly used preventively to control dental caries.[9] An worldwide Standards Organization is currently nearing completion and takes into account general characteristics of mouth rinse safety in a way that is comparable to toothpaste. The physicochemical characteristics of the rinse, the product's active chemicals, and additional additives (such alcohol) are the three main sources of potential dangers and side effects from mouth rinses.<sup>[10]</sup>

### 1.6 OVERVIEW OF ADVANTAGES AND ADVERSE EFFECTS OF MOUTHWASHES

Mouthwashes with a pH of less than 10.4 have the potential to erode enamel, especially dentine, in the acidic range below 5.4-5.5. Although acidified sodium chloride induced enamel degradation akin to that of orange juice, it was demonstrated to be just as efficient against plaque as chlorhexidine.<sup>[11]</sup>

### 1.7 HISTORY OF MOUTHWASHES

1. Ancient Use (Around 2700 BCE): The earliest known use of mouth rinses dates back to ancient Chinese and Indian civilizations, where herbal mixtures were used for oral hygiene.
2. Greco-Roman Era: The Greeks and Romans used mouth rinses made of salt and vinegar. Hippocrates recommended a mixture of salt, alum, and vinegar for cleaning the mouth.
3. Medieval Period: Mouth rinsing practices continued with the use of herbal infusions, wine, or even urine (believed to have cleansing properties).
4. 18th Century: Mouthwash began to be recognized in Europe as a commercial product, often alcohol-based and used for both oral hygiene and breath freshening.
5. Modern Era (19th-20th Century): The invention of antiseptic solutions like Listerine in the late 1800s revolutionized mouthwash use, making it a regular part of oral hygiene routines worldwide.

### 1.8 Types of mouthwashes

- Chemical mouthwash
- Herbal (natural) mouthwash

### 1.9 HERBAL MOUTHWASH

The natural components of herbal mouthwash, known as phytochemicals, provide the intended antibacterial action. Natural mouthwash will gain popularity because it doesn't include alcohol, preservatives, flavour, or colour.<sup>[12]</sup> The natural components of herbal mouthwash, known as phytochemicals, provide the intended antibacterial action. Natural mouthwash will gain popularity because it doesn't include alcohol, preservatives, flavour, or colour.

### Why Should We Prefer Herbal Mouthwash?

Because they target oral pathogens, provide immediate pain relief, and have fewer side effects, herbal mouthwashes are very popular. Chemical mouthwashes are inexpensive, but they can discolour teeth and have adverse effects. They contain hydrogen peroxide and chlorhexidine as instant whitening, sterilising, and pain-relieving agents for teeth.

**1.10 TYPES OF HERBAL MOUTHWASH**

| S.NO. | BRAND NAME                                                              | ACTIVE INGREDIENTS                                                 | FLAVOUR           |
|-------|-------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------|
| 1.    | Therabreath Fresh Breath oral rinse                                     | Oxyd-8                                                             | Mint              |
| 2.    | Listerine Natural Antiseptic Mouthwash                                  | Peppermint, eucalyptus thyme                                       | Mint              |
| 3.    | The natural dentist's healthy gums mouth rinse                          | Aloe-vera                                                          | Mint              |
| 4.    | Closys ultraSensitive mouthwash                                         | Peppermint oil                                                     | Mint              |
| 5.    | Hello, naturally Healthy anti-gingivitis Mouthwash                      | Aleo vera                                                          | Watermelon Mint   |
| 6.    | Tom's of Maine Refreshing Mint Sea Salt Mouthwash                       | Sea salt, Aloe vera                                                | Mint              |
| 7.    | Tom's of Maine Fresh Mint whole Care mouthwash                          | Fluoride                                                           | Mint              |
| 8.    | Hello activated Charcoal extra Freshening mouthwash                     | Activated charcoal Tea tree oil, Coconut oil mint                  | Mint              |
| 9.    | Lumineux oral Erssentials whitening Mouthwash                           | Hydrogen peroxide                                                  | -                 |
| 10.   | Oxyfresh breath Lemon mint mouthwash                                    | Aloe-vera                                                          | Lemon mint        |
| 11.   | JASON Health Mouth tartar control Cinnamon clove fresh Breath mouthwash | Tea tree oil, Greenfruit extract, Perilla seed extract & Aloe vera | Cinnanes & Cloves |
| 12.   | Active Wow 24k white Natural mouthwash tabs                             | Baking soda , Spirulina & sorbitol                                 | Mint              |

**1.11 ORAL ANATOMY**

Speaking, chewing, and biting are all made possible by the amazing and intricate apparatus that is the human mouth.

The teeth, which are essential to mastication and promote general oral health, are at the center of this oral apparatus.<sup>[13]</sup>

Understanding the formation, development, and placement of human teeth is the main goal of the specialised subject of dental anatomy. Understanding dental anatomy can help people and dental professionals better understand the structure and function of teeth, which can improve oral hygiene and increase awareness of this amazing feature of human physiology. In the early phases of digestion, teeth play a crucial role in breaking down food into smaller, easier-to-manage pieces. Additionally, they are essential for articulation, helping to create sounds and enable clear speaking.<sup>[14]</sup>

The 32 teeth that make up the permanent dentition are positioned in a certain pattern in the upper and lower jaws.

Incisors, canines, premolars (bicuspid), and molars are the four primary categories of these teeth. Every kind of tooth has unique qualities that allow it to carry out particular tasks while chewing. The four front teeth in the upper and lower jaws that are located in the middle of the dental arch are called incisors. These teeth are made to cut and bite into food, and they feature a thin, sharp edge. The early phases of food digestion depend on incisors, which also enhance the smile's aesthetic appeal. The canines, also called canines, are located next to the incisors. Canines are good at shredding and grabbing food because of their pointed morphology.<sup>[15]</sup>

**1.12 Oral Infections**

Numerous pathogens, such as bacteria, viruses, and fungi, can cause infections of the mouth and oral cavity. Some of these infections can spread and become systemic, although many simply affect the mouth.

The figure summarises the main characteristics of common oral infections.

| Oral Infections                                        |                                                                                                  |                                                                                                                                                                                                                 |                                                                                                                                                    |                                                                             |                                                                                             |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Disease                                                | Pathogen                                                                                         | Signs and Symptoms                                                                                                                                                                                              | Transmission                                                                                                                                       | Diagnostic Tests                                                            | Antimicrobial Drugs                                                                         |
| Dental caries                                          | <i>Streptococcus mutans</i>                                                                      | Discoloration, softening, cavities in teeth                                                                                                                                                                     | Non-transmissible; caused by bacteria of the normal oral microbiota                                                                                | Visual examinations, X-rays                                                 | Oral antiseptics (e.g., Listerine)                                                          |
| Gingivitis and periodontitis                           | <i>Porphyromonas</i> , <i>Streptococcus</i> , <i>Actinomyces</i>                                 | Inflammation and erosion of gums, bleeding, halitosis; erosion of cementum, leading to tooth loss in advanced infections                                                                                        | Non-transmissible; caused by bacteria of the normal oral microbiota                                                                                | Visual examination, X-rays, measuring pockets in gums                       | Tetracycline, doxycycline, macrolides or beta-lactams. Mixture of antibiotics may be given. |
| Herpetic gingivostomatitis                             | Herpes simplex virus type 1 (HSV-1)                                                              | Lesions in mucous membranes of mouth                                                                                                                                                                            | Contact with saliva or lesions of an infected person                                                                                               | Culture or biopsy                                                           | Acyclovir, famcyclovir, valacyclovir                                                        |
| Mumps                                                  | Mumps virus (a paramyxovirus)                                                                    | Swelling of parotid glands, fever, headache, muscle pain, weakness, fatigue, loss of appetite, pain while chewing; in serious cases, encephalitis, meningitis, and inflammation of testes, ovaries, and breasts | Contact with saliva or respiratory droplets of an infected person                                                                                  | Virus culture or serologic tests for antibodies, enzyme immunoassay, RT-PCR | None for treatment; MMR vaccine for prevention                                              |
| Oral thrush                                            | <i>Candida albicans</i> , other <i>Candida</i> spp.                                              | White patches and pseudomembranes in mouth, may cause bleeding                                                                                                                                                  | Non-transmissible; caused by overgrowth of <i>Candida</i> spp. in the normal oral microbiota; primarily affects infants and the immuno-compromised | Microscopic analysis of oral samples                                        | Clotrimazole, nystatin, fluconazole, or itraconazole; amphotericin B in severe cases        |
| Trench mouth (acute necrotizing ulcerative gingivitis) | <i>Prevotella intermedia</i> , <i>Fusobacterium</i> species, <i>Treponema vincentii</i> , others | Erosion of gums, ulcers, substantial pain with chewing, halitosis                                                                                                                                               | Non-transmissible; caused by members of the normal oral microbiota                                                                                 | Visual examinations, X-rays                                                 | Amoxicillin, amoxicillin clavulanate, clindamycin, or doxycycline                           |

Fig. 2: ORAL INFECTIONS.

### 1.13 MECHANISM OF ACTION OF MOUTHWASHES

In order to prevent and treat oral illnesses such dental plaque, gingivitis, periodontitis, halitosis, and dental caries, mouthwashes are frequently used in addition to mechanical oral hygiene practices. Mouthwashes primarily work by reducing biofilm development, inhibiting plaque accumulation, and having antibacterial activity against oral pathogens. The majority of mouthwashes work by rupturing the bacterial cell membrane, which causes intracellular components to flow out and bacterial metabolism to be inhibited. While some medicines have bacteriostatic effects by preventing bacterial growth and reproduction, others have bactericidal action by directly killing germs. The gold standard mouthwash, chlorhexidine, precipitates cytoplasmic contents by binding to negatively charged bacterial cell walls and



changing membrane permeability. Inhibiting enzyme activity, lowering inflammatory mediators, and penetrating bacterial cell membranes are the basic ways that essential oils and herbal components work. Additionally, certain mouthwashes have deodorising, antiviral, antifungal, anti-inflammatory, and antioxidant qualities that promote better dental health. Furthermore, a number of herbal mouthwashes reduce plaque production and gingival inflammation by interfering with biofilm maturation and preventing bacterial adhesion. Some drugs' substantivity, especially that of chlorhexidine, enables extended oral cavity retention and long-lasting antibacterial action.<sup>[16,17]</sup>

#### 1.14 RECENT DEVELOPMENTS IN MOUTHWASHES

- For plaque and gingivitis, nano mouthwashes are comparable to CHX with less discolouration and taste problems.
- Strong antibacterial properties of Ag, Zn O, TiO<sub>2</sub>, and herbal nano emulsions have been extensively researched.
- Strong biofilm kill, enhanced remineralisation, and wound healing are demonstrated by preclinical research.
- Recent work indicates mucoadhesive, anti odor, and multifunctional nano mouthwash designs.
- Evidence is moderate for short-term plaque/gingivitis control, but low for caries and long-term safety.<sup>[18]</sup>

#### 1.15 Marketed Herbal Formulations of Mouthwashes<sup>[19]</sup>

| S.NO | Brand name                                         | Key ingredients                                     | Part used                          | Category                                                 |
|------|----------------------------------------------------|-----------------------------------------------------|------------------------------------|----------------------------------------------------------|
| 1.   | Himalaya Herbals Active fresh mouthwash            | Fennel oil, Mint                                    | Dried seed oil, Leaves             | Antimicrobial property, Fresh breath                     |
| 2.   | Sylveco herbal mouthwash                           | Peppermint oil, Sage, clove, rosemary               | Leaves, Aqueous extract, Clove bud | Breath freshner, Anti inflammatory, Prevention of caries |
| 3.   | KP Namboodiris Herbal fresh mouthwash alcohol free | Menthol, Clove, Tea tree, Ginger, Nutmeg, Cardamom  | Leaves, Buds                       | Breath freshner, Antimicrobial                           |
| 4.   | Bioayurveda Basics                                 | Tulsi, Turmeric, Neem, Lemon                        | Leaves powder, Leaves, Extracts    | Antibacterial, Prevent plaque                            |
| 5.   | Amarantha herbal mouthwash                         | Amarantha, Nimba, Gandhapura leaf                   | Leaf extract                       | Freshness                                                |
| 6.   | Listrine naturals                                  | Eucalyptol, Menthol, Thymol                         | Oils and extracts                  | Antiseptic, Antiplaque. Antigingivitic                   |
| 7.   | Biomed sensitive mouthwash                         | Plantin, brich leaf, oak bark, bromelain, red grape | Extracts                           | Reduce sensitivity, Remove dental plaque                 |

#### REFERENCES

1. Aulton ME, Taylor KMG. Aulton's Pharmaceutics: The Design and Manufacture of Medicines. 6th Edition. Elsevier Publication, 2021.
2. Banker GS, Anderson NR. Lachman/Lieberman's The Theory and Practice of Industrial Pharmacy. 4th Edition. Mumbai: Varghese Publishing House, 2012.
3. Gennaro AR. Remington: The Science and Practice of Pharmacy. 20th Edition. Lippincott Williams and Wilkins, 2000.
4. Allen LV, Popovich NG. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. 8th Edition. Baltimore, Md: Lippincott Williams & Wilkins, 2005.
5. Shargel L, Wu-Pong S, Yu ABC. Applied Biopharmaceutics & Pharmacokinetics. Journal of Clinical Pharmacology, 2011; 51(11): 1606

6. Gupta, V., Sharma, S. P., Chaurasia, D. K., Shukla, T. P., "Formulation Development of Liquid Dosage Form." International Journal for Research in Applied Science and Engineering Technology, 2023; 11(1): 2321-9653.
7. Batchelor, H. , "Formulations for children: problems and solutions." British Journal of Clinical Pharmacology, 2013; 79(3): 405-418.
8. Gautami, J., "Liquid Dosage Forms." India Nano Science & Nano Technology: An Indian Journal, 2016; 10(3): 0974-7491.
9. Dr. Patil Suvarna, Dr. Hombai Laxmi, Dr. Sanikop Sheetal, Dr. Hebbal Mamta. Is Mouthwash an Eyewash??? A Review. Journal of the Indian Association of Public Health Dentistry, 2011: 18 Suppl III; 928-933.
10. Martin Addy. Oral hygiene products: Potential for harm to oral and systemic health? Periodontology, 2000; 48: 54-65
11. Pontefract H, Hughes J, Kemp K, Yates R, Newcombe RG, Addy M. Erosive effects of some mouthrinses on enamel. J Clin Periodontology, 2001; 28; 319-324
12. Honmane P. Yadav A, Singh S, Mohite S. Microwave Assisted Synthesis of Novel Benzimidazole Derivatives as potent Antileishmanial and antimalarial agents. Int.j.Curr.Adv.Res, 2020; 09(07)(B): 22742-22746.
13. Aksu M, Kocadereli I. Arch width changes in extraction and non-extraction treatment in class I patients. Angle Orthod, 2005; 75: 948–952.
14. . Kahl Nieke B, Fischbach H, Schwarz CW et al. Treatment and post retention changes in dental arch width dimensions a long-term evaluation of influencing cofactors. Am J Orthod, 1996; 109: 368–378.
15. Rees DJ. A method for assessing the proportional relation of apical bases and contact diameters of the teeth. Am. J. Orthod, 1953; 39: 695–707.
16. MFP S3 level clinical Sanz, D Herrera, M Kebschull, *et al.* Treatment of stage I-III periodontitis-The Epractice guideline J Clin Periodontol, 2020; 47 (Suppl 22): 4-60. View at publisher CrossrefView in ScopusGoogle Scholar
17. N West, I Chapple, N Claydon, *et al.*BSP implementation of European S3 - level evidence-based treatment guidelines for stage I-III periodontitis in UK clinical practiceJ Dent, 2021; 106: Article 103562
18. Ahmed B, Ahmed F, Kumar A, et al. Nanoparticle-based oral rinses for plaque control: A systematic review of efficacy and safety. *European Journal of Pharmaceutics and Biopharmaceutics*, 2026; 218: 114910. Available from:ScienceDirect Article
19. Kamble D, Jadhav N, Gawai N. *A Review: Formulation and Evaluation of Herbal Mouthwash*. International Journal of Advanced Research in Science, Communication and Technology, 2025.