



**EXPLORING THE PRESENT STATE AND FUTURE OUTLOOK OF
PHARMACEUTICAL AND HERBAL MEDICATIONS: A COMPREHENSIVE REVIEW**

Varsha Y. Kapgate*, Achal B. Bansod, Rahul A. Shahu and Upadesh B. Lade

Chhatrapati Shivaji College of Pharmacy Deori (441901).



*Corresponding Author: Varsha Y. Kapgate

Chhatrapati Shivaji College of Pharmacy Deori (441901).

Article Received on 05/07/2024

Article Revised on 25/07/2024

Article Accepted on 15/08/2024

ABSTRACT

This review paper delves into the dynamic landscape of pharmaceutical and herbal medicines, examining the current state the industry, the challenges faced, and the promising future prospects. Recent advancements in pharmaceutical research are meticulously analyzed, highlighting breakthroughs in drug development, personalized medicine, and the integration of cutting-edge technologies. Simultaneously, the resurgence of interest in herbal medicines is explored, elucidating the growing recognition of their therapeutic potential and the synergy between traditional and modern medicine. The regulatory frameworks governing pharmaceuticals and herbal products are critically assessed, shedding light on the evolving landscape of quality control, safety, and ethical considerations. The synthesis of evidence-based research underscores the pivotal role of pharmaceuticals and herbal medicines in addressing global health challenges, with a focus on infectious diseases, chronic conditions, and emerging health threats. Additionally, the socio-economic implications of pharmaceutical and herbal medicine use are scrutinized, emphasizing accessibility, affordability, and equity in healthcare delivery. The impact of environmental sustainability and ethical sourcing in pharmaceutical and herbal production is also examined, contributing to the broader discourse on responsible and eco-friendly practices within the industry.

KEYWORDS: Herbal Medicine, Pharmaceutical Research, Challenges, Covid-19, Future Prospective.

INTRODUCTION

The Indian pharmaceutical industry is expected to grow at a CAGR of 16% and reach USD 55 billion by 2020. With over 3,000 companies, 10,500 manufacturing units, and 60,000 generic brands across 60 therapeutic categories, India is expected to be among the top ten pharma markets by 2020. The TRIPS agreement in 2005 has led to significant investment in research, particularly in novel drug delivery and discovery. Indian pharmaceutical research focuses on generics, biosimilars, and new chemical entity discovery.

By 2020, the Indian pharmaceutical market is projected to expand at a 16% CAGR and generate USD 55 billion. India is predicted to be among the top ten pharmaceutical markets by 2020, boasting more than 3,000 enterprises, 10,500 manufacturing facilities, and 60,000 generic names across 60 therapeutic categories. Large sums of money have been invested in research, especially in the areas of new drug delivery and discovery, as a result of the 2005 TRIPS agreement. The areas of interest for Indian pharmaceutical research are novel chemical entities, biosimilars, and generics.^[1]

For primary healthcare, between 75 and 80 percent of the world's population still turns to herbal medicine, particularly in underdeveloped nations (Kamboj, 2000). This is mostly because people generally assume that herbal medications are inexpensive, readily available, and free of negative effects (Gupta and Raina, 1998). The World Health Organization (WHO) reports that the usage of herbal treatments is two to three times more globally than the use of conventional medications (Evans, 1994). Many modern medical practices have their roots in the ancient use of plants for therapeutic purposes, which predates human history. Plants are the source of many traditional medications; just a century ago, the majority of the few effective medications came from plants. Aspirin (Willow bark), digoxin (From foxglove), and quinine are a few example.^[2]

Current scenario of pharmaceutical

According to a survey by Equity Master, the Indian pharmaceutical market ranks thirteenth in terms of value and third in terms of volume.

Additionally, the nation is home to a sizable population of scientists and engineers who might propel the sector. India is the world's biggest supplier of generic medications;

in terms of volume, Indian generics make up 20% of all global exports. Consolidation has recently emerged as a key feature of the Indian pharmaceutical market due to the extreme fragmentation of the business.

India holds a significant place in the world pharmaceutical industry forward to even greater heights.

Currently, more than 80% of the antiretroviral medications used worldwide to treat acquired immune deficiency syndrome (AIDS) are supplied.^[3]

The coronavirus illness (COVID-19) that is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first discovered in Wuhan, China, in December 2019 and then spread to numerous other regions.^[4]

The World Health Organization (WHO) reported as of May 8, 2020, that there were 3,759,967 positive COVID-19 cases, and 259,474 deaths were linked to the virus globally. Over 212 nations and territories have reported SARS-CoV-2 infection cases thus far.^[5]

The WHO designated COVID-19 as a public health emergency of international concern on January 30, 2020. The state of India saw the first SARS-CoV-2 positive

case recorded. On January 30, 2020, in Kerala. The number of instances thereafter sharply increased.^[6]

The National Institute of Virology (NIV), Pune, and an associated testing laboratory received a total of 14,37,788 suspicious samples, according to a news release issued by the Indian Council of Medical Research (ICMR) on May 8, 2020. 56,342 of them had SARS-CoV-2 positive tests.^[7]

IMPACT OF COVID – 19 IN INDIA AND THE GLOBAL ECONOMY

As per the official government guidelines, India is making preparations against the COVID-19 outbreak, and avoiding specific crisis actions or not understating its importance will have extremely severe implications. All the neighboring countries of India have reported positive COVID-19 cases. To protect against the deadly virus, the Indian government has taken necessary and strict measures, including establishing health check posts between the national borders to test whether people entering the country have the virus.⁸ Different countries have introduced rescue efforts and surveillance measures for citizens wishing to return from China. The lesson learned from the SARS outbreak was first that the lack of clarity and information about SARS weakened China's global standing and hampered its economic growth.^[9,10]

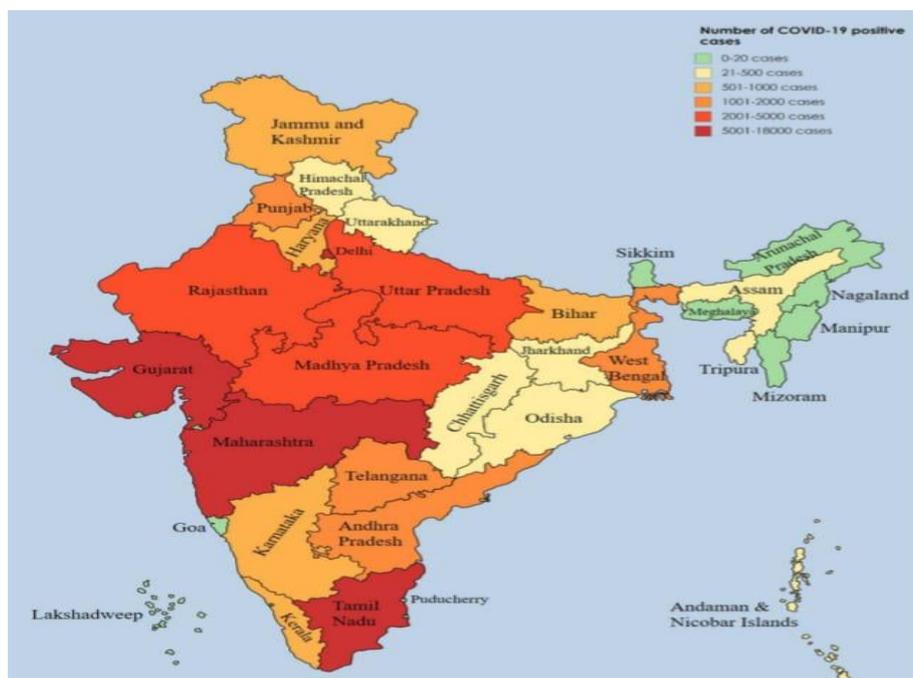


Figure 1: State -wise distribution of positive corona virus disease cases displayed on an Indian geographical map.^[11]

Future viewpoint of corona

Infections caused by these viruses are an enormous global health threat. They are a major cause of death and have adverse socio-economic effects that are continually exacerbated. Therefore, potential treatment initiatives and approaches need to be developed. First, India is taking necessary preventive measures to reduce viral

transmission. Second, ICMR and the Ministry of AYUSH provided guidelines to use conventional preventive and treatment strategies to increase immunity against COVID-19.^[12] These guidelines could help reduce the severity of the viral infection in elderly patients and increase life expectancy.^[13] The recent report from the director of ICMR mentioned that India

would undergo randomized controlled trials using convalescent plasma of completely recovered COVID-19 patients. Convalescent plasma therapy is highly recommended, as it has provided moderate success with SARS and MERS;^[14] this has been rolled out in 20 health centers and will be increased this month (May 2020). India has expertise in specialized medical/pharmaceutical industries with production facilities, and the government has established fast-tracking research to develop rapid diagnostic test kits and vaccines at low cost.^[15] In addition, the Serum Institute of India started developing a vaccine against SARS-CoV-2 infection.^[16] Until we obtain an appropriate vaccine, it is highly recommended that we screen the red zoned areas to stop further transmission of the virus. Medical college doctors in Kerala, India, implemented the low-cost WISK (Walk-in Sample Kiosk) to collect samples without direct exposure or contact.^[17] After Kerala, The Defense Research and Development Organization (DRDO) developed walk-in kiosks to collect COVID-19 samples and named these as COVID-19 Sample Collection Kiosk (COVSACK).^[18] After the swab collection, the testing of SARS-CoV-2 can be achieved with the existing diagnostic facility in India. This facility can be used for massive screening or at least in the red zoned areas

without the need for personal protective equipment kits.^[19] India has attempted to broaden its research facilities and shift toward testing the mass population, as recommended by medical experts in India and worldwide.^[20]

Future prospectus of pharmaceuticals

Upcoming Technologies for Manufacturing In recent years, ten-year-old paradigms of pharmacy have Manufacturing practices for pharmaceuticals and biopharmaceuticals have undergone significant transformation as a result of industry, regulators, and pharmaceutical scientists realizing that antiquated equipment could not be used to manufacture new product generations. Future goods will be more sophisticated. They are often delivered in unique ways, involve combinations of highly active chemicals at low concentrations, and are organized on multiple levels, including nanostructures. Simultaneously, sturdy and efficient solutions are needed due to rising quality demands and growing cost consciousness. New production methods will therefore increasingly complement traditional methods. The primary forces behind new technology are CM, which includes real-time QA through PAT.

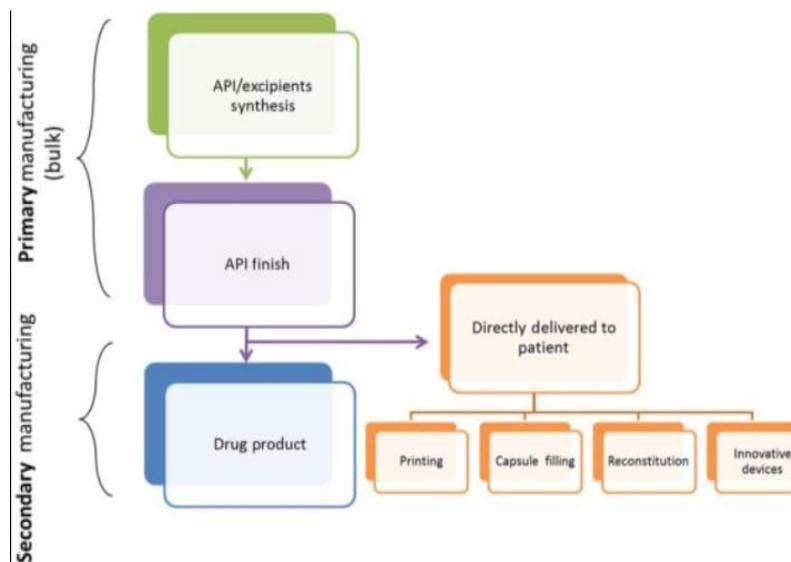


Figure 2: General overview of a continuous manufacturing process, from primary manufacturing (API synthesis, purification and finish) to secondary manufacturing.^[21]

Current scenario of herbal medicine

A. Herbal medicine

The WHO has recently defined traditional medicine (Including herbal drugs) as comprising therapeutic practices that have been in existence, often for hundred of years, before the development and spread of modern medicine and are still in used today.

B. The state-of-the-art of herbal medicine

All traditional systems of medicine such as Ayurveda, Unani and Chinese, and even homeopathy and naturopathy, are primarily plant-based. However, because of being regarded as primitive an unscientific,

these medical practices were ignored and even declared illegal by authorities during the colonial era. In the early 19th century, when chemical analysis came in place, scientists began to extract and modify the active medicinal compounds present in plants and use them as ingredients of allopathic medicines. Later, chemists started synthesizing these compounds and developing their own versions of plant compounds. Not less than 25% of the allopathic prescription drugs contain at least one active ingredient derived from plants. Modern research has proved that herbal medicines are as effective as conventional medicines, besides being exceedingly safe. Estimations suggest that out of the

estimated 250-400 thousand plant species of the world, only 15% have been investigated phytochemically and 6% screened systematically for their biological activity. Over 60% of the drugs in clinical use contain natural compounds or their derivatives, and more than 120 chemical products/moieties from herbal sources are being used as lifesaving drugs (Yuan *et al.*, 2016; PBW, 2018).^[22]

Herbal medicines have earned reputation as “the people’s medicines” because of their easy accessibility, claimed safety, and easy preparation, and are now gradually scorning the mainstream systems of medical treatment in many countries, as improvements in quality control of herbal drugs along with advances in clinical research are now molding the general opinion in their favour. In some Asian and African countries, 80% population depends on traditional herbal medicines for primary healthcare, whereas in many developed countries 70-80% of the population uses complementary or alternative medicines (CAMs) comprising primarily of herbal products. In Japan, 60-70 per cent of allopathic doctors prescribe ‘kampo’ drugs (largely composed of herbal products). About 70% German physicians prescribe plant-based medicines (Ghani, 2013). The WHO Regional Office for the Americas reports that 71% and 40% of the populations in Chile and Colombia, respectively, use herbal medicine. Nearly 46%, 49% and 70% of the populations in Australia, France and Canada,

respectively, are supposed to use CAM. About 158 million Americans use the natural or herbal medicine (Ghani, 2013). Since, the chemical antibiotics often render the causal pathogen strains drug-resistant, it is desirable to explore natural molecules that have a broad-spectrum action and do not induce resistance in the microbial pathogens. The ‘omics’ studies have also provided new impetus to herbal medicine research. Since genomics can find gene clusters and gene duplication events responsible for specialized metabolism, it may help in identifying the gene- metabolite links in plants.^[23]

C. Why people use herbal medicine

The earliest indications of human usage of plants for healing stretch back to the Neanderthal era. There is a growing number of people using herbal medicines. Number of patients who usually fail to disclose concurrent usage to their providers (Miller, 1998). Patients are using herbal therapy for a variety of reasons. A "sense of control, a mental comfort from taking action" is frequently mentioned, which helps to explain why many patients who take herbs have chronic or incurable ailments like diabetes, cancer, arthritis, or AIDS. They frequently think that traditional treatment has failed them in such circumstances. When patients take home remedies for acute, frequently self-limiting illnesses like a cold, sore throat, or bee sting, it's usually because they can't afford to see a doctor.^[24]



Figure 3: Healing herbs.^[25,26,27]

D. Market value of herbal drug

Plant-derived medications have produced an impact on people all around the world because of their health benefits, as well as the fact that they are less expensive in many countries than modern synthetic treatments. Increased consumer knowledge, FDA rules for current Good Manufacturing Practices (GMP), the high cost of contemporary pharmaceuticals, and few or no adverse effects are market-driven dynamics that have expanded the global market for herbal medicines. The world’s largest producers of herbal medicinal plants are China

and India. Most of the herbal medicines are produced in France, followed by Germany in Europe. Saudi Arabia and the United Arab Emirates are the world leaders in the manufacture of herbal medicines in the Middle East. Africa continues to lag behind the rest of the world in herbal medicine manufacturing due to its weak economic and turbulent political status. According to estimates, the global market for herbal medicine will reach \$5 trillion in 2050, up from \$60 billion in 2010. The global herbal pharmaceutical companies leading in this sector and growing rapidly include Nutraceutical International,

USA; Shen Chang Pharmaceutical Company, China; Himalaya Drug Company, India; Zandu Pharma, India;

Dabur, India; and Hamdard Laboratories India.^[28]



Figure 4: Herbal medicinal plants.^[29,30,31,32]

Rosy periwinkle scientific classification



Name: *Catharanthus roseus*

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Order: Gentianales

Family: Apocynaceae

Genus: *Catharanthus*

Species: *Catharanthus roseus*

Other names: bright eyes, Cape periwinkle, de, graveyard plant, Madagascar periwinkle, old maid, pink periwinkle, rose periwinkle.^[33]

E. Efficacy, Bioavailability, Safety and Toxicity of herbal products regulation

Various nations have varied laws and registration requirements for herbal medicines. In the nations where

they are regulated, herbal remedies are divided into prescription and over-the-counter categories. Other herbal goods can also be classified in several ways other than for therapeutic use. Further more, from nation to nation, the legal status of some herbal medications may differ. The relevant, qualified suppliers and distributors of particular chemicals are often covered by the national regulatory framework. Because of this, who can use them and how they are disseminated depends on their regulatory status. Given the above, a careful blend of traditional herbal medicine and evidence-based clinical disease management can ensure far better health care opportunities to people with natural herbal treatment. Figure 5 exhibits the steps required to be taken to develop formulations based on traditional knowledge, keeping in view expectations of the modern world.

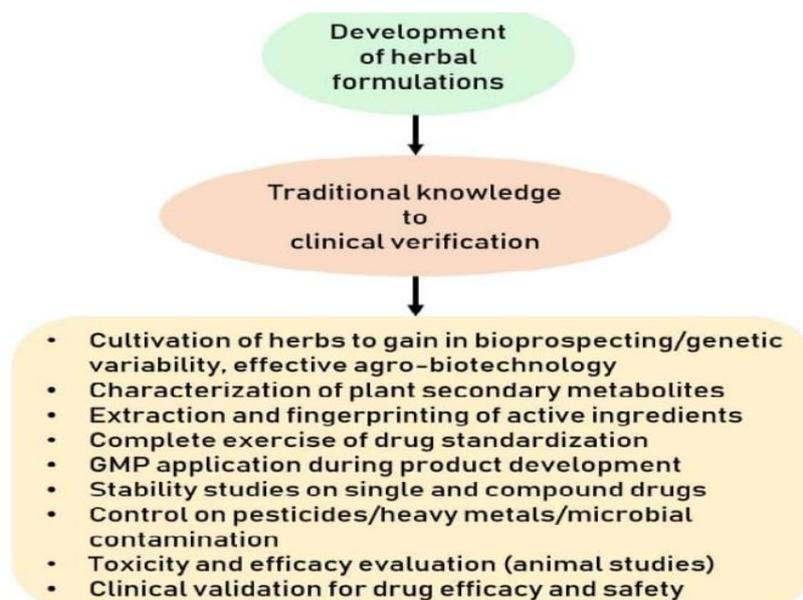


Figure 5: Steps required to be taken to develop formulations of herbal medicine based on the age-old traditional knowledge.^[34]

Table No. 1: List of plants used in the treatment of Chronic and Acute disease.^[35]

Sr. no	Common name	Botanical name	Part used	Family	Uses
1.	Tulsi	Ocimum santum	Leaves	Labiatae	Antitussive
2.	Neem	Azadirachta indica	Leaves	Meliaceae	Antipyretic
3.	Brahmi	Centellaa siatica	Whole plant	Umbeaaifera	Blood purifier
4.	Amla	Embllica officinalis	Friuts	Euphorbiaceae	Antipyretic
5.	Dhaniya	Coriandrum sativum	Leaves, Seeds	Umbelliferae	Carminative
6.	Satavari	Asparagus adscendens	Tuberous roots	Lilliaceae	Demulscent
7.	Bahera	Terminalia belerica	Fruits	Combretaceae	Expectorant
8.	Cinchona	Cinchona officinalis	Bark seeds	Rubiaceae	Antipyretic
9.	Bhindi	Abelmoschus esculentus	Fruits	Malvaceae	Diuretic
10.	Imli	Tamarindus indica	Wood , Volatile oil	Caesalpiaceae	Carminative
11.	Swetchandan	Santalum album	Fruits	Santalaceae	Sedative
12.	Palwal	Santalum album	Roots, Flowers, fruits, bark	Cucurbitaceae	Laxative
13.	Nirgundi	Vitex negundo	Dried roots	Veabenaceae	Astringent
14.	Bish	Aconitum ferox	Leaves, bark, milky juice	Ranunculaceae	Antipyretic
15.	Datyuni	Alstoniascholaris	Stem, Leaves, Root	Apocynaceae	Stimulant
16.	Gulanha	Cocculus cordifolia	Stem	Menispermaceae	Aphrodisiac
17.	Jharhaldi	Coscinum fenestratum	Leaves, Root	Menispermaceae	Stomachic
18.	Phalakantak	Daemia extensa	Dried roots	Ascepidaceae	Expectorant
19.	Kali mirch	Piper nigrum	Roots	Piperaceae	Carminative
20.	Chitravalli	Rubiocordifolia	Roots	Rubiaceae	Astringent
21.	Jwaranthakah	Swertiachirata	Whole herbs	Gentianaceae	Antidote
22.	Gurach	Tinosporacardifolia	Stem,roots	Menispermaceae	Antidote
23.	Jangalilahunan	Allium sativum	Bulb,oil	Liliaceae	Antiseptic
24.	Kasondi	Cassia occidentalis	Leaves, seeds, Root	Caesalpiaceae	Purgative
25.	Bhringraj	Ecliptaerecta	Roots, Leaves	Compositae	Emetic
26.	Akasbel	Cuscutarecta	Seeds, Stem,Fruits	Convolvulaceae	Carminative
27.	Aghata	Achyranthesaspera	Leaves, Seed, Roots	Amarantaceae	Astringent
28.	Cashew	Anacardiumoccidentale	Fruit,seed,bark,oil	Anacardiaceae	Irritant
29.	Ganja	Cannibis sativa	Leaves	Cannabaceae	Analgesic

F. Present status of herbal medicine

Herbal medicine is widely used worldwide and is not just found in developing nations; in fact, estimates suggest that 70% of herbal medicine is commonly prescribed by all French and German doctors (Murray and Pizzorno, 2000). Additionally, there is an exponential increase in the number of patients seeking treatment through herbal methods. The market for herbal goods is expanding as a result of loosening US Food and Drug Administration (FDA) regulations around the marketing of herbal supplements (Gottlieb, 2000). (Brevoort, 1998).^[36]

G. Future prospects of herbal medicine market

It is estimated that nearly three fourths of the herbal drugs used worldwide were discovered following leads from local medicine. According to WHO about 25% of modern medicines are descended from plants first used traditionally. Many others are synthetic analogues built on prototype compounds isolated from plants. In India, almost 70% of contemporary medications are made from natural sources. The fundamental use of plants in medicine will persist in the future, serving as a supply of medicinal substances and a foundation for the extraction of semisynthetic chemicals used in the food, cosmetic, and fragrance industries. The growing acceptance and usage of plant, based products in the cosmetics business, along with rising public costs associated with maintaining personal health and wellbeing on a daily basis, have contributed to the popularity of these goods in the healthcare sector. In their dual capacity as a source of revenue and healthcare, medicinal plants play a significant role in the greater process of development.^[37]

CONCLUSION

The pharmaceutical industry is continuously advancing through innovative research, leading to the creation of more efficient and targeted medications. At the same time, there is a rising interest in herbal remedies due to the increasing demand for natural options. The future outlook suggests a seamless merging of pharmaceutical and herbal methods, leveraging the advantages of both to improve healthcare outcomes. Collaboration between traditional and contemporary medicine could pave the way for a comprehensive and individualized healthcare environment, meeting the diverse needs and preferences of patients. Overall, the dynamic interaction between pharmaceuticals and herbal remedies shows potential for a comprehensive and progressive healthcare model.

REFERENCE

- Sindkhedkar MI, Jagtap SA, Shah CH, Palle VP. Pharmaceutical research in India: current status and opportunities. *In Proc Indian Natl Sci Acad*, 2020; 86, 2: 1015-22.
- Pal SK, Shukla Y. Herbal medicine: current status and the future. *Asian pacific journal of cancer prevention*, 2003; 20, 4(4): 281-8.
- Dhanalakshmi C. Growth of Indian Pharmaceutical Industry: An Overview. *SK International Journal of Multidisciplinary Research Hub*, 2017; 4(12): 6-12.
- Situation report-109. Coronavirus disease, 2019 (COVID-19). WHO (2020). coronavirus-2019/situation-reports (accessed May 09, 2020).
- Wee SL Jr, McNeil DG Jr, Hernández JC. W.H.O. Declares Global Emergence as Wuhan Coronavirus Spreads. *The New York Times*, 2020.
- COVID-19, ICMR. COVID-19. Indian Council of Medical Research.
- COVID-19 update. COVID-19 INDIA. Ministry of Health and Family.
- Qayam. Coronavirus scare in east UP due to cases in Nepal. *The Siasat Daily*, 2020.
- Huang Y. The Sars Epidemic and Its Aftermath In China: A Political Perspective. National Academies Press (US), 2004.
- Qiu W, Chu C, Mao A, Wu J. The impacts on health, society, and economy of SARS and H7N9 outbreaks in China: a case comparison study. *J Environ Public Health*.
- McCloskey B, Heymann DL. SARS to novel coronavirus—old lessons and new lessons. *Epidemiol Infect* (2020).
- Vasudha V. Coronavirus Outbreak: Ayush Pushes “Traditional Cure,” Med Council Backs Modern Drugs. *The Economic Times*, 2020.
- Elfiky AA. Anti-HCV, nucleotide inhibitors, repurposing against COVID-19. *Life Sci*, 2020; 248: 117477. doi: 10.1016/j.lfs.2020.117477
- Teixeira da Silva JA. Convalescent plasma: a possible treatment of COVID-19 in India. *Med J Armed Forces India*, 2020. doi:10.1016/j.mjafi.2020.04.006.
- Sinha DK. COVID-19: Vaccine Development and Therapeutic Strategies. *India Bioscience*, 2020.
- Varghese MG, Rijal S. How India Must Prepare for a Second Wave of COVID-19. *Nature India*, 2020.
- Koshy SM. Inspired By South Korea, Walk-In COVID-19 Test Kiosks Built In Kerala. *NDTV.com* (2020).
- MK N. Covid-19: Kerala Hospital Installs South Korea-Like Kiosks to Collect Samples. *Livemint*, 2020.
- DRDO. Covid-19 Sample Collection Kiosk (COVSACK). Defence Research and Development Organisation - DRDO|GoI, 2020.
- Vaidyanathan G. People power: how India is attempting to slow the coronavirus. *Nature*, 2020.
- Rantanen J, Khinast J. The future of pharmaceutical manufacturing sciences. *Journal of pharmaceutical sciences*, 2015; 1, 104(11): 3612-38.
- Parveen B, Parveen A, Parveen R, Ahmad S, Ahmad M, Iqbal M. Challenges and opportunities for traditional herbal medicine today, with special reference to its status in India. *Ann Phytomed*, 2020; 9(2): 97-112.
- Parveen, Bushra, Abida Parveen, Rabea Parveen, Sayeed Ahmad, Minhaj Ahmad, and Muhammad Iqbal. "Challenges and opportunities for traditional herbal medicine today, with special reference to its status in India." *Ann Phytomed*, 2020; 9, 2: 97-112.

24. Pal SK, Shukla Y. Herbal medicine: current status and the future. *Asian pacific journal of cancer prevention*, 2003; 20, 4(4): 281-8.
25. Gebreyohannes G, Gebreyohannes M. Medicinal values of garlic: A review. *International Journal of Medicine and Medical Sciences*, 2013; 5(9): 401-8.
26. Dissanayake KG, Waliwita WA, Liyanage RP. A review on medicinal uses of *Zingiber officinale* (ginger). *International Journal of Health Sciences and Research*, 2020; 10(6): 142-8.
27. Nasri H, Sahinfard N, Rafieian M, Rafieian S, Shirzad M, Rafieian-Kopaei M. Turmeric: A spice with multifunctional medicinal properties. *Journal of HerbMed Pharmacology*, 2014; 1, 3(1): 5-8.
28. Hossain CM, Gera ME, Ali KA. Current status and challenges of herbal drug development and regulatory aspect: a global perspective. *Asian J. Pharm. Clin. Res*, 2022; 15: 31-41.
29. Pegu AJ, Sharma MA. Review on Aloe vera. *Int J Trend Sci Res Dev*, 2019; 3(4): 35-40.
30. Hassan S, Mughal A, Farman M. *Emblica officinalis* (Amla): A prospective review on distinctive properties and therapeutic applications of Amla. *Biomed. Nurs*, 2020; 6: 22-30.
31. Gangwar AK, Ghosh AK. Medicinal uses and pharmacological activity of *Adhatoda vasica*.
32. Mondal A, Upadhyay RK, Ma J, Yadav BK, Sharma SK, Mondal A. Bifurcation analysis and diverse firing activities of a modified excitable neuron model. *Cognitive neurodynamics*, 2019; 15, 13: 393-407.
33. Mishra JN, Verma NK. A brief study on *Catharanthus roseus*: A review. *Intern J Res Pharmacy Pharmaceut Sci*, 2017; 2(2): 20-3.
34. Parveen B, Parveen A, Parveen R, Ahmad S, Ahmad M, Iqbal M. Challenges and opportunities for traditional herbal medicine today, with special reference to its status in India. *Ann Phytomed*, 2020; 9(2): 97-112.
35. Gunjan M, Naing TW, Saini RS, Ahmad A, Naidu JR, Kumar I. Marketing trends & future prospects of herbal medicine in the treatment of various disease. *World Journal of Pharmaceutical Research*, 2015; 28, 4(9): 132-55.
36. Pal SK, Shukla Y. Herbal medicine: current status and the future. *Asian pacific journal of cancer prevention*, 2003; 20, 4(4): 281-8.
37. Gunjan M, Naing TW, Saini RS, Ahmad A, Naidu JR, Kumar I. Marketing trends & future prospects of herbal medicine in the treatment of various disease. *World Journal of Pharmaceutical Research*, 2015; 28, 4(9): 132-55.