Conference Paper Title*

Madhuja
Department of Computer Science and Engineering
Amrita School of Computing, Bengaluru
Amrita Vishwa Vidyapeetham
bl.en.u4cse22212@bl.students.amrita.edu

G Bhavya Reddy
Department of Computer Science and Engineering
Amrita School of Computing, Bengaluru
Amrita Vishwa Vidyapeetham
bl.en.u4cse22225@bl.students.amrita.edu

Srinidhi M
Department of Computer Science and Engineering
Amrita School of Computing, Bengaluru
Amrita Vishwa Vidyapeetham
bl.en.u4cse22270@bl.students.amrita.edu

***Abstract*—This project is a comparison of Ayurvedic medicines with the conventional medicines by using Natural Language Processing with sentiment analysis. For the purpose of comparison, two datasets were prepared by collating the user comments from various online sources-one for Ayurvedic medicines and another for Conventional medicines. The project preprocesses textual data along with techniques of tokenization and stopword removal and techniques of lemmatization for final suitability. Sentiment analysis is done using the SentimentIntensityAnalyzer from NLTK with comments classified as positive or negative. Evaluation takes place through the utilization of confusion matrices and classification reports, yielding results in judging public perception of both medicinal practices. The analysis of a user's sentiments may help in understanding how people judge these different healthcare systems, thus adding to the larger discussion of alternative and modern medicine.**

***Index Terms*—component, formatting, style, styling, insert**

I. Introduction

There are a lot of medical practices that exist in the healthcare landscape, two major approaches that are present being Ayurvedic and Conventional medicine. Ayurvedic medicine is originating from ancient India, a vision of healing that perceives nature as a restorer of balance within one's person. Herein, the use of Conventional medicine is based upon modern scientific discovery and founded upon pharmaceutical drugs and evidence-based practice for the treatment of ailments. Hence, perception about the two systems among the public has come more into perspective, if alternative medicine growth is considered.

Public opinions on both forms of medicine are mostly expressed through posting reviews and comments online, which form a treasure trove for analysis. This project attempts to compare user sentiment between Ayurvedic and Conventional medicines using Natural Language Processing. It examines content produced by users regarding the way each system works with regards to efficacy, side effects, and experiences across the board.

Data was extracted from varied sources over the web like youtube, amazon, reddit, etc. There are two major datasets- one regarding Ayurvedic medicines and the other regarding conventional medicines. These datasets contain a rich variety of user opinions, which are well suited for application in sentiment analysis-a technique that classifies the emotional strength of text. This would classify the comments of being either positive or negative or neutral in sentiments so that public perceptions regarding both systems of medicine can be brought to light.

The major stage in NLP was text preprocessing. Preprocessing ensured that the text data was cleaned and standardized before its application in sentiment analysis. Tokenization, removal of stopwords, and lemmatization were the steps taken as preprocessing. Tokenization is that process that breaks the text into individual words or tokens for easier analysis. The removal of stop words removes common words which have little meaning added to the contexts such as "the," "is," "and" and so on. Lemmatization reduces words to their base or dictionary form, thus considering all forms of a word in the same perspective.

The preprocessed data was then sent to the process of sentiment analysis with the help of NLTK's SentimentIntensityAnalyzer. It will assign sentiment scores to the comments and be able to analyze comments based on their sentiment scores as being positive or negative. With this view, the sentiment for every comment is recorded in the dataset.

This approach on sentiment analysis provides data-driven oversight toward public opinions regarding these two disparate medical systems. By taking close look at user sentiments, this project would contribute to better understanding of public opinion and different perceptions towards healthcare in the society.

II. Literature Survey

[1] This paper discusses managing diabetes (chronic illness characterized by increased blood glucose levels brought on by insulin resistance or deficiency), with Ayuredic and Allopathy methods. Ayurveda, an old native medical system of India promotes a holistic approach by using nutrition,

lifestyle modifications, herbs, and exercises like yoga and meditation to balance the body's doshas. Insulin and other oral hypoglycemic drugs are the leading pharmaceutical modalities in allopathy, or conventional Western medicine, for keeping blood sugar levels from spiraling out of control. In this article, the authors discuss the downsides and negative effects of allopathic medicines along with presenting evidence in support of Ayurvedic treatments. The strengths of integrating both strategies is speculated which also raises the possibility that a combined approach could result in a more thorough, patient-centered treatment plan. Combining Ayurvedic techniques with allopathy can help medical practitioners ensure treatment success and lower the chances of complications, leading to improved wellness for patients. Such an association not only showcases innovative & cost-effective solutions but also take forward the health system on Universal Health Care model. Opting to amalgamate Ayurveda with allopathic therapy may render better treatment results and harmony in the overall well-being.

[2] This article explores the historical and modern applications of allopathic and herbal medicine systems. It also advocates for an integrative healthcare strategy with both conventional allopathic procedures and herbal remedies while highlighting the advantages and disadvantages of both. The benefits of combining allopathic and Ayurvedic medicine can prove to be advantageous even if each system has its flaws. Ayurvedic medicine's focus on prevention combined with allopathy's advances can result in the betterment of patients' healthcare needs. The changing requirements of society and the progress of medical systems encourages the integration of various techniques. This can lead to a potential way to improve illness prevention, diagnosis, treatment, and overall well-being.

[3] This paper states that in India and other developing nations, kidney stones are a serious health concern that impact 10-12% of the population and have a 50% recurrence rate. The stones made of calcium oxalate, can due to dietary oxalates from foods including spinach, chocolate, and rhubarb and can also be formed due to high uric acid and low citrate levels. Kidney stones can cause problems such as an elevated risk of heart disease and obesity. Reducing consumption of foods high in oxalate and considering herbal medicines in addition to allopathic treatments are suggested strategies for managing and preventing kidney stones. It is recommended to use herbal remedies in conjunction with a low-fat diet and natural sources of fiber to help reduce the issues associated with kidney stones. The paper further emphasizes that kidney stones are a global problem worsened by dietary habits rich in fat, malnutrition, and overindulgence in foods high in oxalate. Allopathic medicines and surgery are examples of modern diagnostic that are advanced ans sophisticated but many still choose herbal remedies since they are safe and affordable. Combining herbal and medical therapies could provide a effective approach to kidney stone care.

[4] This research explores how Ayurveda and Allopathy were percieved during the COVID-19 pandemic. Traditional Indian medical practises like Ayurveda are frequently employed with or instead of Western treatment. In the survey conducted by the authors, approximately one-third of participants out of 229 respondents between the ages of 18 and 35, favored Ayurvedic therapy, especially for liver and gastrointestinal disorders. Ayurveda's decreased side effects, accessibility, and affordability are the reasons behind its growing popularity both during and after the pandemic. Allopathy is still the therapy of choice for major illnesses like brain disorders, malignancies, and heart difficulties, even though there is a noticeable trend toward combining Ayurvedic and Allopathic therapies. Overall, the study shows that there is a tendency toward integrating the two systems in order to improve healthcare.

The paper [5] describes the prediction of the appropriate Ayurvedic medicines by different machine learning algorithms against certain pains. This study takes 200 medicinal herbs data and analyses the methods followed by Naive Bayes, logistic regression, and DTNB using the WEKA tool. Properties of these herbs have been analyzed in making herbal recommendations against different diseases, meaning all this can be done accurately. It can fill the missing link between Ayurvedic knowledge and modern technology that is currently inaccessible to the public. The present study concludes that machine learning can be of help in identifying and defining the most appropriate medicines, thereby changing the way of prescription and usage of Ayurvedic treatments.

The paper [6] presents a model for the integration of Ayurvedic and Allopathic Electronic Health Records in Sri Lanka. The challenge is bringing together these divergent practices under one umbrella. As such, information standardization and interoperability activities turn out to be pertinent in enhancing efficiency and access to health services in line with the proposed model. The paper relates to the challenge of integrating traditional and modern medical systems with solutions to create a database and use effective language. This will complement and smoothen the patients' knowledge for better health, which will lead to better management of patients through the combination of Ayurveda and allopathic medicine.

Arogya is an intelligent management platform for the identification and management of Ayurvedic herbal medicines. [7] This paper describes how to design a comprehensive database with a friendly user interface that assists users in identifying herbs from the provided instructions. Herbal recommendations for Ayurvedic treatment are given to users by use of machine learning algorithms, which are then utilized in medicine. The following case studies underline just this use of digital tools in preserving and bringing an update to traditional medical knowledge. According to him, Arogya can offer reliable information and advice on how to make Ayurveda effective, practical, and accessible to the growing consumer interest in alternative medicine.

[8] describes the application of machine learning for the prediction of the imbalance of Ayurvedic components: Vata, Pitta, Kapha in the human body. In this paper, many factors will be considered, and then appropriate algorithms for their analysis and prediction of the discrepancies of these

products will be used. This paper is aimed at a fusion of the Ayurvedic knowledge and traditional knowledge with modern data analysis to achieve a right diagnosis and treatment. The results can provide a scientific basis for the understanding and management of imbalances in Ayurveda through machine learning and open a new context for holistic health. This integration should ensure the uniqueness of Ayurveda and itself in modern medicine.

[9] Traditional medical systems has been integrated into public health services as a part of health policy in many countries, especially in India, since the state governments integrated TM in PHC in the 1980s. This integration has had several objectives: increasing easy access to healthcare services, meeting diversified patient preferences for treatment, and using traditional medical knowledge. Research, including that by the World Health Organization, has established how TM can complement holistic care and fill service gaps in delivery related to chronic conditions and culturally specific health issues. The use of traditional and biomedical systems alike is influenced by socio-economic and cultural factors—a phenomenon called medical pluralism. Most people utilize more than one health system, either simultaneously or interchangeably. This, therefore, calls for the elicitation of patients' preferences and treatment patterns in planning effective healthcare and resource allocation.

[10] In the case of COVID-19, comparisons were drawn between Ayurveda and allopathic treatments; Ayurveda alone showed some promising benefits in the management of symptoms, depending upon the condition of the patients. Allopathic treatment strategies mainly include mechanisms related to the inhibition of viral infection via endocytosis and ACE receptor signaling. The past outbreaks of SARS-CoV and MERS-CoV clearly explained that coronaviruses are prone to transmit the disease across species and highlighted the need for variability in medical treatments. The WHO-declared COVID-19 pandemic in early 2020 pointed to urgent requirements for effective treatments, as it has rapidly been spreading all over the world with serious disturbances in health, economic, and social life. Such comparative analysis of the treatments from these two traditions illustrates the integrations of multi-medical systems necessary for improved healthcare outcomes during pandemics.

Incorporation of allopathic and Ayurvedic medicines provides the benefits curated out of the two, which in turn results in better patient care; one being symptomatic in treatment and orienting towards immediate relief, the evidence-based approach, sophisticated diagnosis, and pharmacological intervention. The paper [11] presents a complete orientation that goes to the emphasizing holistic treatment, prevention, and balancing the body, mind, and spirit by application of natural remedies, diet, and lifestyle changes. Comparative studies indicate that, while allopathic medicine is good for acute care and emergencies, Ayurveda excels in chronic disease management and preventive health. There are various studies conducted by Patwardhan et al. (2005) and Patel and Peterson (2020) that have shown Ayurvedic practices like Panchakarma and Rasayana bring substantial improvements in the quality of life, which means the combination of herbal remedies with modern surgical technologies could actually work to develop a better healthcare system. One such synthesis of ideologies is in-depth research into their compatibility.

Diabetes is a high challenge in the world's health. The figure has increased from 537 million adults, projected to stand at 643 million in 2030 and 783 million in 2045. In the low- and middle-income countries, the burden is very high, with the ranking placed second highest in prevalence in India. It cuts across all age groups, thus highly straining the national healthcare system economically. Risk factors include ethnicity, age, obesity, physical inactivity, unhealthy diets, and genetic predisposition. Though it is so prevalent, a large chuck of the population remains undiagnosed, and the percentage goes up to about 57% of diabetic adults in India. Allopathic treatments, because of their complexity, numerous side effects, and high costs, have made many seek alternative therapies like Ayurveda, which has lesser side effects. Effective management of Type 2 Diabetes Mellitus consists of control over blood sugar, blood pressure, and lipid levels through diet and exercise with associated lifestyle modifications. In view of this, the study [12] has compared allopathic and Ayurvedic managements of T2DM while taking into consideration demographic, socio-economic, and regional criteria for understanding their clinical impact and effectiveness.

The paper [13] presents a case report on the successful Ayurvedic treatment of a 47-year-old female patient who was suffering from interstitial cystitis finding manifestation with suprapubic pain, burning micturition, and urinary frequency; for the prescription, the patient was administered Ayurvedic formulations like Dhātri Mix and Candraprabha vaṭi for 45 days. These herbal formulations, targeting the basic pathophysiology by balancing the deranged Vata and Pitta doshas, resulted in significant improvement in symptoms, which were confirmed by sonographic studies and symptom assessments. In the current scenario, the report brings out the potential of Ayurveda in the management of IC and suggests these treatments as an alternate choice to the presently available conventional medical and surgical options.

The article [14] explains the scope of Ayurvedic treatment in the management of hypoxemic conditions among COVID-19 patients. During the second wave of the COVID pandemic that struck across the length and breadth of India, some Ayurvedic practitioners gave a few formulations to some of their patients having low oxygen saturation (SpO2) levels. This article presents four cases where sublingual Ayurvedic treatments were used and how the patients improved in their SpO2 levels and further overall patient conditions. Where the fever and cough did subside to a great extent in patients, one elderly patient, suffering from severe symptoms, succumbed following discontinuation of treatment. The researchers urge future studies be conducted on how to incorporate Ayurvedic interventions into regular COVID-19 care in order to decrease oxygen supplementation and intensive hospital care.

The research [15] studies the preparation of Yashada pushpa

(zinc oxide nanoparticles) with the aid of traditional Ayurvedic methods and its antibacterial efficacy against pathogens responsible for eye infections. A Yashada pushpa extracted from zinc was made by purifying zinc and then heating it inside a high-temperature vessel. Its antibacterial properties were checked in this study against Staphylococcus aureus, Escherichia coli, and Streptococcus pneumoniae, the bacteria causing bacterial conjunctivitis, a common eye condition. The agar well diffusion method was used to test antibacterial activity; the standard used was 0.3% Gentamycin eye drops. Results showed Yashada pushpa as a potential herb with significant antibacterial activities, thus indicating its importance as an alternate or adjunct therapy for bacterial conjunctivitis in Ayurveda.

The study [16] evaluates the efficacy of Ayurvedic interventions on gouty arthritis caused by the deposition of monosodium urate crystals due to hyperuricemia. The patients have been taken in a single-group pre-post test design after being diagnosed using the 2015 ACR-EULAR Gout classification criteria. The therapies administered include Guduchi Siddha Ksheeravasthi (therapeutic enema), Guduchi Kashaya (decoction), and Punarnava Guggulu. Pain was improved in 98.77% and serum uric acid in 57.81% significantly with normalization of ESR and increase in Haemoglobin. Therefore the study concludes that the Ayurvedic principles intervention can be significant help in management of gouty arthritis.

REFERENCES

[1] A. Reddy, "A Comparative Analysis of Ayurvedic and Allopathic Approaches to Diabetes Management", IJAAM, vol. 1, no. 1, pp. 47–52, Jun. 2024.

[2] Ahmad, Aminu and Ruchi Sharma. "Comparitive Analysis of Herbal and Allopathic Treatment systems.", 2020.

[3] Khan F, Haider MF, Singh MK, et al. "A comprehensive review on kidney stones, its diagnosis and treatment with allopathic and ayurvedic medicines.", Urol Nephrol Open Access J. 2019

[4] D. Gupta, "Determining Perception and Predilection for Ayurveda versus Allopathy amongst Educated Individuals Studying and Practising Allopathy at Different Levels", SRMsJMS, vol. 8, no. 02, pp. 126-130, Dec. 2023.

[5] P. Indoriya and S. Barde, "Prediction of Ayurvedic Herbs for Specific Diseases by Classification Techniques in Machine Learning," 2022 2nd Asian Conference on Innovation in Technology (ASIANCON), Ravet, India, 2022, pp. 1-4.

[6] Stranieri, Sahama, Butler-Henderson and Perera, "A model for the introduction of Ayurvedic and Allopathic electronic health records in Sri Lanka," 2016 IEEE International Symposium on Technology and Society (ISTAS), Kollam, India, 2016, pp. 1-6.

[7] N. Pathiranage, N. Nilfa, M. Nithmali, N. Kumari, L. Weerasinghe and I. Weerathunga, "Arogya -An Intelligent Ayurvedic Herb Management Platform," 2020 61st International Scientific Conference on Information Technology and Management Science of Riga Technical University (ITMS), Riga, Latvia, 2020, pp. 1-6.

[8] V. Madaan and A. Goyal, "Predicting Ayurveda-Based Constituent Balancing in Human Body Using Machine Learning Methods," in IEEE Access, vol. 8, pp. 65060-65070.

[9] Phillips, D.R., Hyma, B., Ramesh, A." A comparison of the use of traditional and modern medicine in primary health centres in Tamil Nadu.", GeoJournal 26, 1992.

[10] Talwar, Shivangi et al. "Ayurveda and Allopathic Therapeutic Strategies in Coronavirus Pandemic Treatment 2020." Current pharmacology reports vol. 6, 2020.

[11] Gope, Ananya. "Comparative Assessment Of Ayurvedic And Allopathic Methods.", 2024.

[12] Bindu, Radhika, and Abhay Dharamsi. "A Comparative Study of Allopathy and Ayurveda Medicines in the Treatment of Type 2 Diabetes Mellitus and Its Clinical Impact." Journal of Young Pharmacists, vol. 15, no. 4, Dec. 2023, pp. 755–59.

[13] Dr Swathy Surendran, Dr Sharath S G, Dr Rajeshwari P N, "AYURVEDA UNDERSTANDING AND MANAGEMENT OF INTERSTITIAL CYSTITIS", ayurpub, Mar-Apr 2021, Vol VI, Issue 2.

[14] Joshi J, Payyappallimana U, Puthiyedath R. "Potential for supportive Ayurvedic care in hypoxemic COVID-19 patients.", J Ayurveda Integr Med. 2022 Apr-Jun.

[15] Dhanya Soman Pillai, Ramesh Narve Venkatesha, Vineeth Paramadam Krishnan Nair, "Pharmaceutical preparation of zinc oxide nanoparticles (Yashada pushpa) by traditional ayurvedic methods and its In vitro antibacterial activity in selected pathogens causing eye infections ", PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON ADVANCES IN MATERIAL SCIENCE AND CHEMISTRY (ICAMSC – 2023), Volume 3171, Issue 1.

[16] Vaprath Kuniyil, Aswathi Rajan, Soman, Devipriya, Kundagol, Mahesh C. and Chacko, James. "Efficacy of Ayurvedic treatment protocol in gouty arthritis – a clinical study" Journal of Complementary and Integrative Medicine, vol. 20, no. 1, 2023, pp. 278-283.