

Herbal Drug Medicines in the Prevention and Management of COVID Pandemic: A Case Study of ZINDA TILISMATH using Clustering Approach

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Abstract—Since ancient times people incorporated plant extracts from leaves, barks, and roots for healing, opening its wings to the drug industry comprising of Allopathy, Homeopathy, Ayurvedic and Unani medicine. New viruses emerged with dynamic variants bringing the Covid-19 pandemic, which put the global population to a halt. Since there was no permanent cure, only trial and error based medicines helped. People were ready for any medication which saved their lives. One of the Herbal companies which are really doing well is Zinda Tilismath. In this paper an attempt is made to explain how this herbal medicine proved its effectiveness in curing and prevention of illness using statistical analysis. Statistical test k-means clustering is used to prove the clinical findings with the correlation of choosing the closest relations, and accordingly suggestions were given. The purpose of the proposal is to find the opinion of the people for this herbal drug, for which the drug is analyzed based on the dataset collected from survey by using clustering algorithm. It is concluded that the herbal products of Zinda Tilismath are effective in the prevention and curing of the disease. It is extensively known in Hyderabad, but still needs to extend its branches over the world. Other competing products are Himaliya, Hamdard Joshanada and Qarshi Johar Joshanda, etc. The herbal drug is a mixture of camphor, eucalyptus, thymol, menthol and alkanet root (also called ratanjyoth).

Index Terms—Complementary Therapy, Covid Pandemic, Herbal Plants, Zinda Tilismath.

I. INTRODUCTION

The average human being is working and trying to safeguard their life, whenever any type of calamity took place, with different types of medications. The Covid-19 pandemic is also one of them. As of 13th March 2023, the statistics for the pandemic is: Corona-virus Cases:681,591,554, Deaths:6,812,126, Recovered: 654,550,3331. During and post Covid Pandemic, the purchasing behaviour of the consumers has changed drastically, with the change in frequent buying patterns. For the prevention of Covid, Unani medicines were also used by most of the people, the most trusted one being Zinda Tilismath. This particular medicine is doing well since decades in Telangana, and was found to be effective and relieving during the Covid Pandemic. The objective of this paper, is to demonstrate the credibility and usability of the Tilismath medicine in rehabilitation.

History: zinda tilismath is a herbal (unani) company manufacturing product established in the year 1920, making it a hundred years old, by a unani doctor Mohammed Moinuddin

Farooqui to deal with cold, cough in the form of balms, and drops, and have made their own niche in the state of Telangana. Of all the products the Farookhy tooth powder is a successful brand prepared from the herbs and barks of trees, used for pain reduction, teeth whitening, which control bad breath, tooth decay and bleeding gums. The zinda tilismath drops is another successful product, it is a great protection supporter and helps in reducing headaches, cold, joint pains, neck pain, stomach disorders and muscular pain. During the pandemic it was used with steam to get relief and was found to be very effective.

Research Methodology: Data is collected from the reviews collected from the public using secondary and primary sources and an analysis is done on it to study its impact. The secondary data supported in gaining the information which made the base for the primary research, where survey was done through structured questionnaire and observation. A sample of 100 was chosen with non-probabilistic convenience sample technique from sampling units and the analysis was done using K-Means clustering concept.

Data Analysis: The technique of k-means clustering algorithm is used to analyze the data.

II. RELATED WORK

Khalid et al. (2022) has worked on the statistics of covid and has highlighted the restrictions like social isolation rules, individual sanitation, and using masks helps in successfully controlling the COVID 19 disease. The algorithm is designed to detect the mask so as to make it mandatory for the people to help spread the disease.

Raza & Nikhat (2022) has found that covid pandemic has altered the mind-set and lifestyle of people, thereby affecting the market to a larger extent as the altered ordering and spending habits of the shopper is influencing buyer purchases rate drastically. People are going out only for buying vital and necessary products, group favorites, purchasing behavior, and shifting spending more on personal care and health goods and homebased transports has increased digital payments.

Nikhat (2019) highlighted the impact on the decision-making process; the consumers get influenced with the integrated marketing communication tools, though all tools have different impacts.

Nikhat (2021) has explored on the perceptions and expectations and suggested that in the service industry outlet atmospheric condition plays a significant role like need gratification, ambience, store layout, customer care, and locality.

Atul et al. (2020) explained the usefulness of plants like onion, garlic, ginger, neem, pineapple, kiwi, papaya, pomegranate, piper longum, myrobalan, gauche, shatavari, jaiphal, jivanti, peppermint as a regular practice and upkeep during the viral infection. Therefore, conservation of green plants is essential.

Raza & Nikhat (2021) has found out that the pandemic time was the flourishing time for expertise and changing the mode from offline to online initiating from selecting the shopping preferences, ordering from the necessity goods to the entertainment and creating a huge impact on online marketing and e-commerce industry.

Mishra et al. (2013) has stated that the phytochemicals present in various variegated leaf cuttings have active antiseptic action and cytotoxic potential against human cancer cell lines.

Daria et al. (2023) found that the combination of various nanostructures can remove *S. Aureus* and bacteriophage MS2 with efficiency and low-pathogenic HCoV-OC43 corona pandemic by a ZIF-8-changed face cover using 1 h of UV treatment.

Li wen Tian et al. (2010) researched on the fresh fruits of eucalyptus maiden with phloroglucinol glycosides, eucalmainosides, flavonoids, oleuropeic acid derivatives, hydrolyzable tannins, simple phenolic compounds in different proportions and found to be effective.

Desai et al. Onion, garlic, ginger, neem, pineapple, kiwi, papaya, pomegranate, piper longum, myrobalan, guduchi, shatavari, jaiphal, jivanti, peppermint, growth, will boost the immunity and can fight against the infection.

Badam et al. (1999) explained the activity & mechanism of Coxsackie B group of viruses, & proposed that NCL-11 was found most effective.

Chiang et al. (2003) proposed that aqueous cuttings of *Caesalpinia pulcherrima* Swartz is useful in trials and was found well.

Jaleeli et al. Arisen in China, COVID-19 (SARS-CoV-II) proposed that citrus plants boost the immune system, thereby acting as a component towards supportive therapy.

Rahmani et al. (2022) tried to sense the face edge and confirm the proper mask covering with a procedure to mechanically sense an expression mask by using Deep Learning detection with 4500 images.

III. RESULTS AND DISCUSSIONS

A. Data Analysis and Interpretation

The dataset collected from the repository created from the survey is uploaded to generate the statistics using Google Colab. The Panda library is used to do the transformation which includes pre-filtering, cleaning, exploring, analysing and manipulating data by reading the .CSV files using `read_csv()` function and converting them to dataframes. The plots are generated using the violin plot function from seaborn to display the responses of effective usage of products of Zinda Tilismath during the time of covid using gen-

der classification. The approaches of Chi-square test and K Means Cluster were used for the Analysis.

A timely reminder of the nature and consequences of Public Health Emergencies of International Concern is provided by the pandemic of Coronavirus Disease 2019 (COVID-19). The effectiveness of the analysis is predicted using the

Machine learning approach as depicted in figure 1. The self-created dataset with 22 features with 120 records are used to do the analysis. Some of the features are email-id, Age, income, gender, education, awareness of the brand, usability, frequency, purchase place, purpose, effectiveness, price, popularity, availability, and other suggestions. The survey with statistical analysis for the questionnaire based on covid is reflected in table I. The statistics is applied on the scale of 25%, 50% and 75% split under the training and the calculated central tendencies are represented in tables.

The price of the product is comparatively low as it is prepared from the leaves of the plant. Plants are one of nature's greatest gifts to humankind, serving not only as a source of food but also as a source of medicine for the treatment and prevention of a variety of diseases. The cost comparison is shown in table II.

TABLE I: EFFECTIVENESS OF THE PRODUCTS OF ZINDA TILISMATH DURING THE CORONA PANDEMIC

Products are most effective for the CORONAVIRUS DISEASE (COVID 19 Pandemic)	
Parameter	Values
count	66.000000
mean	2.424242
std	1.447126
min	1.000000
25%	1.000000
50%	2.000000
75%	3.000000
max	5.000000

The product is trusted and preferred by people in all age groups, It's a known product for giving 100% trustability.

TABLE II: PRICE IS CHEAPER COMPARED TO THE COMPETITOR'S PRODUCTS

Parameter	Values
count	66.000000
mean	2.545455
std	1.590180
min	1.000000
25%	1.000000
50%	2.000000
75%	4.000000
max	5.000000

Herbal medication that offers prompt relief from cough, cold, headache, and stomach ache, and basic health related issues the predictive analysis for its popularity is listed in table III.

Popularity of the product and its usage is drastically increased during the Covid Pandemic. The product is high in demand and is easily available in small and big grocery shops as depicted in table IV. The products were produced largely to facilitate its availability in the market during Covid Pandemic.

The product is purchased frequently as it is used by more people showing high frequency as the same can be inter-

TABLE III: POPULARITY OF THE PRODUCT DURING THE COVID PANDEMIC

Parameter	Values
count	64.000000
mean	2.593750
std	1.399759
min	1.000000
25%	1.000000
50%	2.000000
75%	4.000000
max	5.000000

preted from the statistics shown in table V. The purchase frequency has been constantly increasing since Covid Pandemic.

TABLE IV: AVAILABILITY OF THE PRODUCT IN THE MARKET

Parameter	Values
count	65.000000
mean	2.430769
std	1.570920
min	1.000000
25%	1.000000
50%	2.000000
75%	4.000000
max	5.000000

TABLE V: THE PURCHASE FREQUENCY DURING THE COVID PANDEMIC

Parameter	Values
count	66.000000
mean	2.545455
std	1.570711
min	1.000000
25%	1.000000
50%	2.000000
75%	4.000000
max	5.000000

The performance of the model is evaluated on the test data using the `F1_score`, `mean_squared_error`, and `mean_absolute_error` functions from the `scikit-learn` library to measure the error in prediction. The measure of the goodness of fit of the model, with a value close to 1 indicating a good fit and a value close to 0 indicating a poor fit. The MSE is the average squared difference between the actual and predicted values, and the RMSE is the square root of the MSE. The Mean Absolute Error (MAE) is the average absolute difference between the actual and predicted values. The usage and the product popularity are depicted in figure 1.

Zinda Tilismath is popular among the buyers and is comparatively less expensive. Purchase frequency of Gender as Female and Male between the Age group of 21 to 40 years is shown in figure 2. The ability to produce a desired or intended result is shown in figure 3.

The analysis of product usage based on the symptoms is listed in table VI.

The effectiveness of the system is shown by the metrics Efficacy as depicted in figure 3.

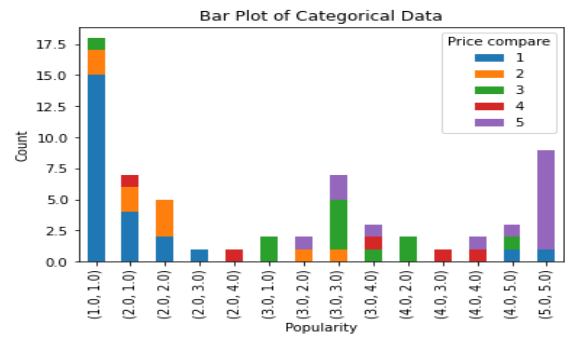


Fig. 1: Popularity of the Products

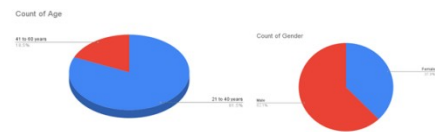


Fig. 2: Frequency of the Products based on Gender

TABLE VI: THE METRICS VERSES SYMPTOMS

Metrics/ Symptom	Over all Health	Cough	Cold	Pain
Count	65.00	65.00	65.000	65
Mean	0.2615	0.0154	0.0923	0.02
Std	0.4428	0.1241	0.2917	0.13
Min	0.0000	0.0000	0.0000	0.00
25 %	0.000	0.0000	0.0000	0.00
50%	0.000	1.0000	1.0000	1.00

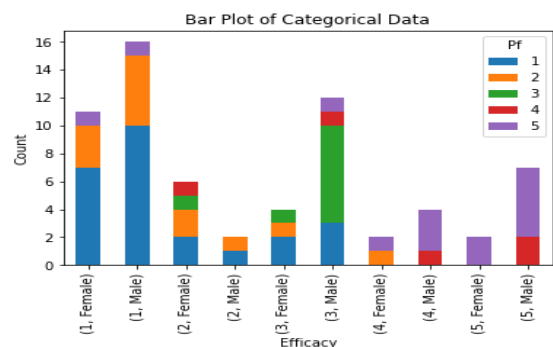


Fig. 3: Efficacy of the Product

The dataset is loaded as input from the user created dataset, which is collected from the survey; by importing file names as `updatedcols.csv`. The categorical attributes are `['Gender', 'Age', 'Income', 'Education', 'Aware', 'Which Products', 'purpose']`. These attributes are converted using one hot encoding technique to numerical data, which a machine can understand easily. Dropping of nuisance columns in DataFrame reductions which is done by replacing the unknown values with mean, median and mode. The data frame is loaded from the Panda library and by using the violin plot function, collected from seaborn to plot the effectiveness of the medicine in covid cases using gender classification. The statistics of the product with its effectiveness and performance metrics is depicted in table VII.

TABLE VII: PERCEPTION ABOUT THE EFFECTIVENESS OF THE PRODUCTS IN COVID BASED ON GENDER

The mean calculated is replace unknown values				
Parameters	effectiveness in covid Cases	Price	Popularity	Availability
mean	2.446154	2.569231	2.619048	2.45312

Mean for Gender				
Parameters	Pf	Gender_Female	Gender_Male	Age_21 to 40 years
mean	2.569231	0.384615	0.615385	0.815385

Mean for Age and purpose					
Parameters	Age 41-60 yrs	Income Above Rs 50,000	Purpose None	Purpose Others	Purpose Over all Health
Mean	0.1846	0.230769	0.2769	0.046154	0.261538

The Mean for age is 18, the income above 50,000 rupees is 23 and for overall purpose is 0.26%. The gender wise popularity is depicted in figure 4. It may visualize pairwise relationships between variables in a dataset using the Seaborn Pairplot. By condensing a lot of data into a single representation.

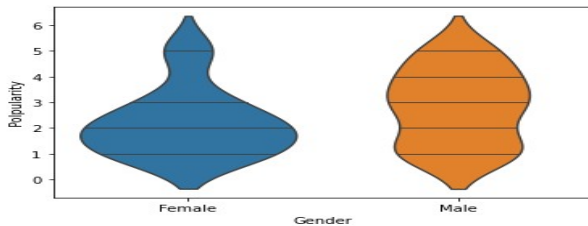


Fig. 4: Perception about the Effectiveness of Zinda Tilismath Based on Gender

This gives the data a pleasant visual representation and aids in understanding the data. Figure 5 depicts the popularity of the product in covid with respect to all parameters.

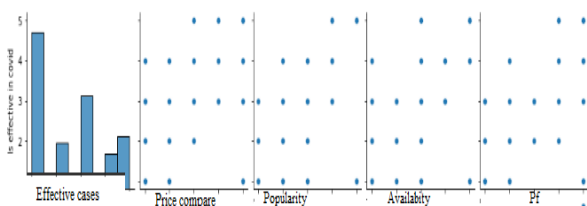


Fig. 5: Popularity of Zinda Tilismath Gender wise

It, explains how the Pairplot function is used from seaborn to visualize all the columns against each other using histogram and scatter plot techniques, effectiveness for cases, price comparison, popularity, increase in purchase frequency during Covid Pandemic and availability of the product is shown in the figure 6.

It shows the increase in the purchase frequency in relation to the deals and offers, or reduction of the price. The loyal customers feel that the pricing deals or offers are attractive.

The expensive products are less in demand, as popularity and purchase are found compared to economical products showing that India is a developing country with more percentage of the population in the middle working class therefore people buy products on per line more.

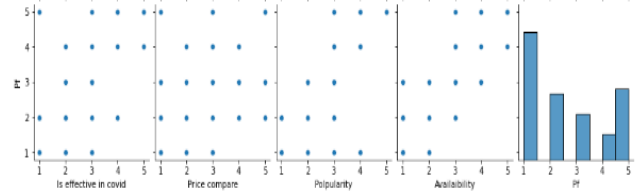


Fig. 6: Purchase frequency in relation to other parameters

It shows the effects on parameters if the covid cases are active. The purchase frequency is less if the covid case is active as the patient would be busy with his/her ailment. The effectiveness of the medicine is depicted in figure 7. Pairplot function is used from seaborn to visualize all the columns against each other using histogram and scatter plot techniques.

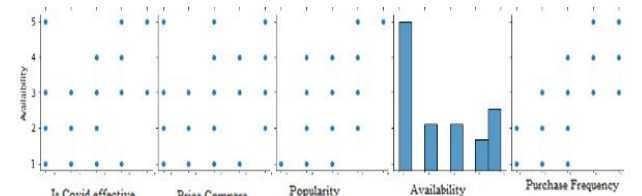


Fig. 7: Availability of the products and its related factors relationship

The availability of the products and its related factors are depicted in figure 7. The online business of the Zinda Tilismath products were highly in demand during the lockdown phase when most of the people were at home and suffering from the virus.

The K-means algorithm is used to create the clusters and the extracted features are placed in the chosen cluster. The scenario is executed on three clusters, by finding the distance from the centroid of the clusters; using euclidean distancing; the features are pulled into the cluster with the nearest centroid. The labels of the clusters are [0, 1, 2] and the 66 data points are allocated to the clusters in the matrix form represented below. The training is done using an unsupervised learning algorithm and later on to do the prediction to which cluster a new data point belongs will be applied. Clustering is used to group the data points into one category with similar characteristics, hence the values listed below gives the allocation of data points to three clusters namely { 1, 2, 3}

[2 2 0 2 0 0 0 2 0 2 0 2 0 0 1 2 2 2 0 0 2 0 2 1 0 2 2 0 2 1 1 0 2 1 2 0 0 2 2 2 0 0 2 0 2 0 0 1 1 0 1 0 1 1 2 2 1 1 1 1 0 0 0 1]

B. Users Responses of the Product of Zinda Tilismath.

Findings: The purchase frequency was increased during the covid times. Products are most effective during the covid 19 Pandemic. Price is cheaper than the competitor products like Amrutanjana, Vicks, Pain Balm and Pitambari products. Popularity of the product is pretty good; the product was available in the market easily during the pandemic. The purchase frequency has increased since the pandemic and is constantly sold in the market.

IV. CONCLUSION

Most of the customers with different age and income groups were found using the brand, which signifies its awareness. It is supplied by grocery stores and medical shop too. The popularity of the product is quite good but the product is neither national nor international. Since it was found quite productive in results during covid it should increase the awareness so that maximum people should get benefit of it as still people are suffering with cough and cold without any side effects.

Suggestion. The product is known in Telangana state but for its publicity more social media platforms should be used, since the brand is found to be very effective, but still needs to be communicated and create awareness among the population.

REFERENCES

- [1] Atefeh Jalali, Farid Dabaghian, Hossein Akbrialiabad, Farzaneh Foroughinia, Mohammad M Zarshenas, A pharmacology-based comprehensive review on medicinal plants and phytoactive constituents possibly effective in the management of COVID19, PMID: 33159391, [DOI: 10.1002/ptr.6936]
- [2] Atul Desai, Chirag Desai, Hemshree Desai, Anjuman Mansuri, Jital Desai, ATBU Harita, Smt. B N B. Swaminarayan. Possible Role Of Medicinal Plants In Covid19 - A Brief Review ISSN: 2455-2631, April 2020 IJSDR, Vol. 5, Issue 4, IJSDR 2004034 International Journal of Scientific Development and Research (IJSDR), [Available online: www.ijedr.org.]
- [3] Badam L, Joshi SP, Bedekar SS. 'In vitro' antiviral activity of neem (*Azadirachta indica*. A. Juss) leaf extract against group B coxsackieviruses. The Journal of Communicable Diseases. Jun; Vol. 31, Issue 2: pp. 79-90. 1999.
- [4] Chiang LC, Chiang W, Liu MC, Lin CC, 2003. In vitro antiviral activities of Caesalpinia pulcherrima and its related flavonoids. J Antimicrob Chemother, Vol. 52, Issue 2: pp. 194-198.
- [5] Daria Givirovskaia, Georgy Givirovskiy, Marjo Haapakoski, Sanna Hokkanen, Vesa Ruuskanen, Satu Salo, Varpu Marjomäki, Jero Ahola, Eveliina ORepo, Modification of face masks with zeolite imidazolate framework-8: A tool for hindering the spread of COVID-19 infection, [https://www.researchgate.net/publication/358748750_Modification_of_face_masks_with_zeolite_imidazolate_framework8_A_tool_for_hindering_the_spread_of_COVID-19_infection [accessed Feb 03 2023]]
- [6] Li-Wen Tian, Ying-Jun Zhang, Chang Qu, Yi-Fei Wang, Chong-Ren Yang, J. Phloroglucinol glycosides from the fresh fruits of *Eucalyptus maiden*, Nat Prod., 2010 Feb 26; Vol. 73, Issue 2: 160-3. [Doi: 10.1021/np900530n. Affiliations expand, PMID: 20092288.]
- [7] Mohammad Khalid Imam Rahmani, Fahmina Taranum, Reshma Nikhat, Md. Rashid Farooqi & Mohammed Arshad Khan, Automatic Real-Time Medical Mask Detection Using Deep Learning to Fight COVID-19, Computer Systems Science & Eng. Techpress, Vol. 42, Issue 3, pp. no 1181-1198. Scopus | ID: covidwho-1716452
- [8] Md Danish Raza and Reshma Nikhat, Impact of Coronavirus on Consumer Behaviour: 2022 ECS Trans. Vol. 107, Issue no 1, pp. 11559.
- [9] Reshma Nikhat, An Integrated Marketing Communications, Media Synergies and its effect on the Consumer Decision Making Process, SUMEDHA-Journal of Management Referred Journal of CMR College of Engineering & Technology April-June 2019, Vol. 8, Issue 2, pp 20-32 ISSN: 2277-6753 (Print) ISSN: 2322-0449 (Online) <http://cmrcetmba.in/sumedha/> An Integrated Marketing Communications, Media Synergies, and its effect on the Consumer Decision Making Process.
- [10] Mishra, Sharma AK, Kumar S, Saxena AK, Pandey AK. 2013. *Bauhinia variegata* leaf extracts exhibit considerable antibacterial, antioxidant and anticancer activities. BioMedResInt, 2013: ID915436. [doi:10.1155/2013/915436.]
- [11] Xin Yi Lim, Bee Ping Teh, and Terence Yew Chin Tan on behalf of the Herbal Medicine Research Centre (HMRC) COVID-19 Rapid Review Team, Medicinal Plants in COVID-19: Potential and Limitations