

An Insight into Use of Medicinal Herbs as Immunity Booster against COVID- 19

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Abstract: To combat the persistent transmission of the coronavirus, Indian Government has started the vaccination in the country since January 2021. The immunity conferred by the vaccine can be more effective with sound immune health. In India, medicinal herbs are preferred dietary habits to enhance the immunity intrinsically. A web-based survey of herbal medicinal plants was carried out among the young-adults to identify the consumption trend of the medicinal herbs as an effective immune booster to reduce the spread of COVID-19. The selected herbs are ingredients of regular Indian cuisine and practiced under Ayurveda. Out of the total selected herbs, *Allium sativum*, *Coriandrum sativum*, and *Citrus limon* were the most frequently used plants in cuisine whereas *Osmium sanctum*, *Azadirachta indica* and *Emblica officinalis* were the most used medicinal herbs on regular basis. Leaves followed by stem/bark; fresh form followed by dried and hot water followed by cold water were the most frequent parts, forms and mode of intake. Cuisine herbs were found to be utilized in other forms while medicinal plants were more used as tea. However, some of the medicinal plants were never used by young adults. The present study revealed that young-generation is aware of selected medicinal herbs and consumed intentionally to boost their immunity.

Keywords: COVID-19, traditional medicinal plants, immunity booster, young generation, awareness

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Introduction

In 2020 and again in 2021, the whole world faced a pandemic situation with the advent of a recently identified coronavirus that put human civilization in crisis [1]. The disease was first reported in December 2019 in the provinces of Wuhan, China, and about 218 countries and territories worldwide became infected with the infection, resulting in around 38.4 lakh deaths [2, 3, 4]. World Health Organization declared it as a pandemic in March 2020. With the collective and remarkable efforts of entire medical and pharmaceutical community the vaccines against the novel coronavirus have been developed successfully. Recently, the Government of India has also launched two successful vaccines Covishield and Covaxine to counter COVID-19.

Health professionals and practitioner, however, also advise that innate immune systems are essential for the efficacy of the vaccine. Among the several potential candidates tested for improved immunity, herbal formulations have always been prioritized [5, 6]. Practice of herbs and medicinal plants (HMPs) to enhance the immunity stand more relevant in Indian subcontinent where Ayurveda holds the roots of medical system. Herbal preparations of Ayurveda have served to be cure for many deadly and contagious diseases. As per recommendation by Ministry of AYUSH (<https://www.mohfw.gov.in>) few commonly used herbs and medicinal plants (HMPs) have been selected for the study including Garlic (*Allium sativum*), Dalchini (*Cinnamomum zeylanicum*), Lemon (*Citrus limon*), Coriander (*Coriandrum sativum*), Jeera (*Cuminum cyminum*), Turmeric (*Curcuma longa*), Mentha (*Mentha spp.*), Black pepper (*Piper nigrum*), Clove (*Syzygium aromaticum*), Ajwain (*Trachyspermum ammi*), Meethi (*Trigonella foenum-graecum*), Ginger (*Zingiber officinale*), Neem (*Azadirachta indica*), Amla (*Emblica officinalis*), Tulsi (*Osmium sanctum*), Mumijo or Shilajit, Kutki (*Picrorhiza kurroa*), Giloy (*Tinospora cordifolia*), Ashwagandha (*Withania somnifera*).

The HMPs alluded above, are popular culinary herbs which in regular Indian cuisine and/or are practiced under Indian Ayurveda medicine and traditional Chinese medicine as well [7]. These HMPs are most widely used as antioxidants, antiseptic, anti-carcinogenic, antibacterial, antiviral, antimalarial, anti-common flu, indigestion, oedema, cough, immune boosters and immune modulatory agents [8]. Amla, Giloy, Neem, Kutki, Ashwagandha, Shilajit and Mentha known because of their role as immune-modulatory, anti-inflammatory and antiviral agents [1, 8, 9, 10, 11, 12, 13].

Considering the tremendous value of these HMPs, a project was undertaken through a general web-based survey among young Indian adults on the awareness of herbal medicines as an important immune booster to reduce the spread of COVID-19.

Method and materials

Survey methodology

The study was carried out collaboratively by the Department of Biology and Microbiology, Institute of Home Economics, University of Delhi, New Delhi, India using online-survey to obtain data from young adults on utilization of medicinal plants as an immunity booster, during the COVID-19 pandemic. The survey was conducted from the 23rd to 31st of October among young adults attending college, between 18 to 32 years of age group, through google forms accessible via any electronic device having internet connection. The survey forms were disseminated through private and institutional networks (email and WhatsApp).

Questionnaire

The questionnaire was prepared using online Google forms and validated by Expertise from Department of Epidemiology & Clinical Research, Institute of Liver and Biliary Sciences, New Delhi, India. The structured questionnaire packet for 19 HMPs included questions based on utilization of HMPs parts (leaves, bark/stem, root, fruit/seed, flower, used whole/intact, don't know which part is used, never used the plant), form (fresh herb, dried herb, as paste, as powder, don't know the usage form, never used the plant) and, intake mode (mixed with cold water, mixed with hot water, as a tea, as other forms, never used the plant). At the end of the survey, total responses from 321 individuals were collected, however 23 responses were removed from the final analysis as outliers of selected age range. The survey is based on probabilistic method of sampling that provide statistical collection of population parameters which cannot be controlled but targets a large sample for survey dissemination. Participants personal information including name were

anonymized to maintain confidentiality. Such anonymous nature of web-based survey does not require approval from Ethical Committee.

Statistical analyses

The data set was subjected for principal component analysis (PCA) to identify possible grouping of studied HMPs and their parts, forms and mode of intake using Minitab® 19.1.

Results and Discussion

The study received 321 responses from the targeted age groups of young adults. A total of 19 herbs were used in this study, based on the literature review of their medicinal efficiency [7,14,15]. To attain better understanding of response data, the selected herbs were divided into two groups a) common cuisine herbs and b) medicinal herbs. Group 'common cuisine herbs' consisted of twelve plant species as follow: Garlic (*Allium sativum*), Dalchini (*Cinnamomum zeylanicum*), Lemon (*Citrus limon*), Coriander (*Coriandrum sativum*), Jeera (*Cuminum cyminum*), Turmeric (*Curcuma longa*), Mentha (*Mentha spp.*), Black pepper (*Piper nigrum*), Clove (*Syzygium aromaticum*), Ajwain (*Trachyspermum ammi*), Methi (*Trigonella foenum-graecum*), Ginger (*Zingiber officinale*); and group 'medicinal herbs' consisted of seven plant species viz. Neem (*Azadirachta indica*), Amla (*Emblica officinalis*), Tulsi (*Osmium sanctum*), Mumijo or Shilajit, Kutki (*Picrorhiza kurroa*), Giloy (*Tinospora cordifolia*), Ashwagandha (*Withania somnifera*).

Use frequency of the herbs was calculated based on survey. Among 'common cuisine herbs', garlic (*A. sativum*), coriander (*C. sativum*), lemon (*C. limon*), turmeric (*C. longa*), mentha (*Mentha spp.*), and black pepper (*P. nigrum*) were the most used plant species. Under group 'medicinal herbs', Tulsi (*O. sanctum*) followed by neem (*A. indica*) and amla (*E. officinalis*) were the most used herbs (Fig 1). Leaves (31% and 46%) followed by stem/bark (25% and 19%) were the most used plant parts for both groups (Fig. 2a). These plants were mostly consumed as fresh herb form (39% and 48%) or dried herb form (38% and 24%) (Fig. 2b). The survey revealed that the most common mode of herbs' intake for both the groups was with hot water (37% and 35%) followed by tea (22% and 15%) and cold water (12% and 14%) respectively (Fig. 2c). These herbs were also used in other forms by few people (26% and 19% respectively). However, the survey also revealed that a certain population of young adults were unaware of the use and consumption of (6%, 20% and 2%, 19% respectively). This trend was found higher in the medicinal herbs compared to common cuisine herbs (Fig. 2). Similar findings have been reported by Harmukh [16]; Khadka *et al.* [17]; Yang *et al.* [18]. The intake of herbs mixed with water, in the form of tea/ kadha has been reported by Yang *et al.* [18]; Singh *et al.* [19] in their studies on based on mode of herb intake during COVID-19 times.

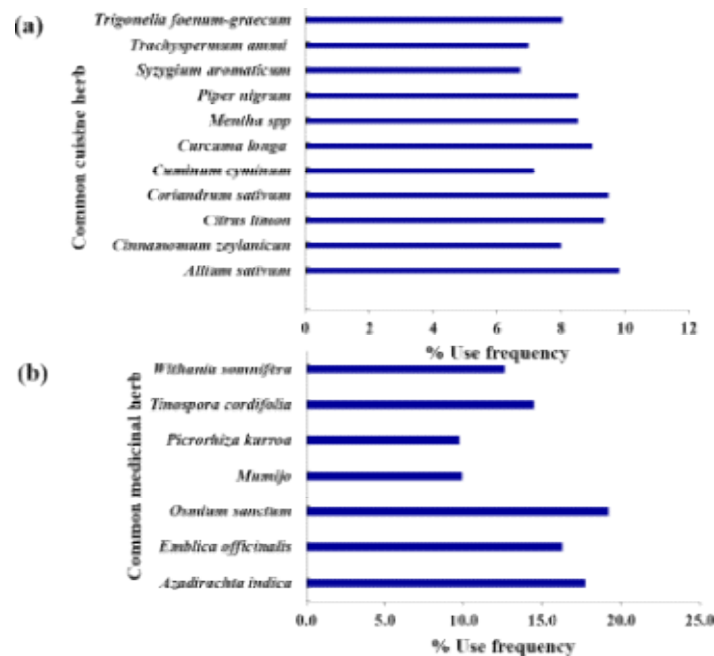


Figure 1: Use frequency of the herbs used for the prevention purposes during the Covid-19 pandemic.

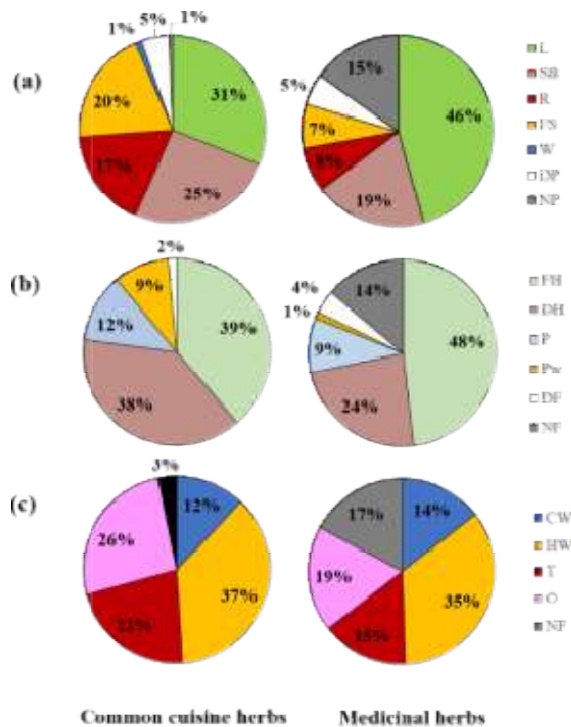
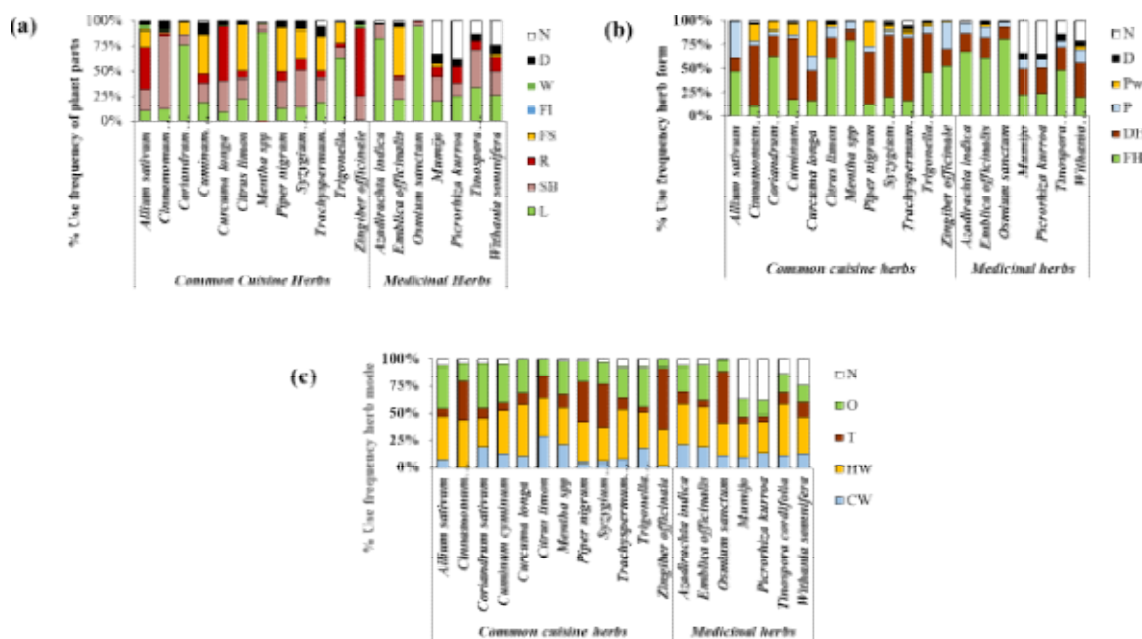


Figure 2: The figure shows a) utilized parts of HMPs, b) form of HMPs' c) mode of HMPs intake. L: Leaf, SB: Stem/bark, R: Root, FS: Fruit/seed, W: Whole plant/intact, DP: Don't know the part, NP: Never used nay part, FH: Fresh Herb, DH: Dried Herb, P: Paste, Pw: Powder, DF: Don't know the usage form, NF: Never used any form, CW: Herb mixed or taken with cold water, HW: Herb mixed or taken with hot water, T: Herb used as tea, O: Herb used in other form, NF: Never used the plant.



AYUSH, have been imparting continuous efforts to educate the young minds of India about the importance of Ayurveda health benefits such as persuade people to drink kadha (an herbal immune booster) during this pandemic time [27]. Our study also corroborates with the study conducted by El Alami *et al.* [28] in Morocco. However, *P. kurroa*, Mumijo, *W. somnifera* were the herbal products which were responded to be 'never used the plant part' and 'don't know the plant part' by young adults. The study does not suggest that these medicinal plants are the cure of Covid-19 but it can improve the immune system that in turn can help us in combating the situation.

Conclusion

This study projected the awareness of herbal medicinal plants in regular Indian cuisine as immunity booster against COVID-19 due to the presence of bioactive ingredients among young adults. Herbal medicinal plants were taken intentionally by the Indian young adults to enhance their immunity during the COVID-19. The study can be helpful in retaining the community knowledge on traditional medicine practices which has been vanishing.

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