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A SYSTEMATIC REVIEW BASED ON USE OF HERBS AS IMMUNITY BOOSTERS IN DAY TO DAY LIFE

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ABSTRACT: The advent of COVID-19 pandemic has changed the public outlook towards their health. People have started taking insurance policies to make their lives secure financially. Simultaneously, a concept of prevailing one's body such emergency through increase in the natural immunity of the body has been introduced. This includes changes in lifestyles and diet. Ministry of AYUSH released a list of 20 herbs claiming to boost the immunity of people. In continuation to it many formulations claiming to have immunity boosting properties came into the market. Immunity of human beings can be boosted by using products derived from nature. We have focussed on the possible use of common herbs and spices as immunity boosters to fight against disease. An online survey was conducted among males and females of various age groups from few North Indian States i.e. Haryana, Punjab and Delhi. A short questionnaire was prepared to analyse the perception of people with regard to immunity boosting activity of common herbs. Around 200 participants took part in the survey. According to survey approx. 70% people use turmeric milk for boosting their immunity during the pandemic, most people think that CORONIL kit is also useful in preventing the infection, about 57% people follow the guideline released by Ministry of AYUSH, some people believe in allopathic medicines rather than ayurvedic medicines. Most people are using turmeric as gargles with warm water, some of them use ashwagandha, dalchini and similar herbs as immunity boosters. Hence majority of subjects rely upon the immunity boosting power of commonly used herbs and have faith on them.

Keywords: Herbs, AYUSH, CORONIL.

INTRODUCTION

1.BACKGROUND OF THE STUDY

The present survey is based upon the use of herbs in day to day life to control and prevent diseases. In India, various herbs are being used from ancient times. During the outbreak of COVID-19 there was no specific treatment for combating this infectious virus. Hence apart from the Allopathic R&Ds, Ministry of AYUSH was also expected to contribute in the direction of providing the solution to control the pandemic. During this period Ministry of AYUSH released some guidelines as a measure of coronavirus infection. These guidelines include use of turmeric, Dalchini, Ashwagandha, Guduchi, Ardarka etc. to boost immunity¹. The Ministry of AYUSH said that gargling with warm water of turmeric reduces the chance of infection or turmeric milk is also beneficial for improving immunity(1).. During this period many Ayurvedic companies came forward with their products with claims to improve the general immunity in humans. "Coronil kit" launched by Patanjali was approved as immunity boosting agent but was confused to be a remedy for corona by general public because of its name(2). Corona pandemic period has in a way, proved that whatever discoveries we might have done so far, in the direction of antimicrobial therapy, we are still far behind to achieve the target of combating infectious diseases. Whatever we discover, everytime a new variant emerges with resistance to the existing antimicrobial drugs(3). Hence the scientists are now focussing on boosting our natural immunity. The immunity boosting power of some of the naturally occurring foodstuffs have been recognised by AYUSH and their benefits have been propagated amongst the common masses. The present survey analyses the mind set of common in this regard.

This period witnessed many claims by pharmaceutical and other companies about their products with regard to improve immunity of general public. Since no specific treatment of this infection is available till date, reliance upon immunity boosting power of herbs used since ancient times is the only way to get rid of this infection(4).

Therefore, we have conducted a survey to know the perception of general public about such claims.

1.1 Regulatory Status for the approval of dietary supplement as immunity boosters

Dietary supplements and nutraceuticals are non pharmacological products, so there are different regulatory protocols for them. US FDA and other regulatory bodies do not take the full responsibility of nutraceuticals but they are monitored under the Food and Drug Modernization Act (1997) & Dietary Supplements, Health and Education Act (DSHEA, 1994). In 1997. Dietary supplement office was established by FDA for surveillance purpose ,due to increase in sale of nutraceuticals and dietary supplements(5).



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Data of a new dietary supplement must now be submitted in a prescribed format to ODSP for review purpose. The responsibility of dietary supplements in the terms of safety, efficacy and overall quality is of its manufacturer. whole. There is no requirement of seeking approval from FDA for manufacturing and marketing of nutraceuticals and dietary supplements in US. India has its own regulatory frameworks for traditional and phytomedicines, which are not common in Western Societies(6). There is a debate between scientists and regulatory authorities for the development of widespread frameworks to handle the challenges of safety and health claims related to nutraceuticals, because these products do not follow the same rigorous trials as followed by pharmaceuticals(7). These disparities came in ‘lime light’ during COVID 19, as many individuals and companies have gained financial benefit by selling immunity boosters and nutraceuticals(8).

1.2 Market status of immunity boosters during COVID 19 pandemic

The recommendation of Ministry of AYUSH include the use of mixture of Ocimum Tenuiflorum, Cinnamon, black piper, ginger, ashwagandha in decoction form for the prevention of novel coronavirus(9). Because of the interest of general public in dietary supplements for the prophylactic use in the management of this disease, there was increase in sale of dietary supplement, approximately 5% in 2019 and approx. 44% increase in 2020 worldwide(8). In India, there was increase of about 16% in sale of dietary supplements. Consumption of turmeric powder is increased more than five times to 14.4%, besides milk food drinks that doubled growth to 6%, honey and chyawanprash(10).

1.3 Misleading advertisements and legal violations

During this pandemic period, the market witnessed a series of launches of medicines and food supplements with claim to boost the immunity. Brand manager Baba Ramdev’s company launched “Coronil Kit” while the entire medical world was struggling to find vaccine for treatment of COVID- 19 disease(2). Patanjali claimed that it has developed a 100% cure of coronavirus. However Ministry of AYUSH, Yoga, Naturopathy and Unani opposed Patanjali, Because of its failure to present scientific claim and reliable data in this regard(11). Later on it was certified by AYUSH as per WHO norms as “supporting measure in COVID-19 and as immunobooster”(12). On April 21, 2020, A gazette notification was issued by ministry of AYUSH , which stipulates that in which manner the research studies on COVID-19 have to be done with AYUSH interventions(13).

Before advertisement and distribution, Patanjali did not take any approval from Government. Later on, “Coronil kit” was approved as supportive measure in the management of COVID-19. It is not for treatment of COVID-19 disease(14). There was a clear violation of Drug and Magic Remedies Act, 1954. ICMR and AYUSH did not take any responsibility for “Coronil kit”. Patanjali is not only one in this race; various misleading advertisements were found. About 50 campaign by Ayurveda or Homeopathy drug manufactures offering cure for COVID -19 disease. Another example is “Arihant Mattresses” claimed that sleeping on these mattresses boost the immunity.

Therefore, we surveyed about the mindset of the general public regarding the claims pertaining to immunity boosting ability of the common plants.

1.5 Recently Approved Medicinal Herbs

World Health organization supports the use of traditional drugs whose pharmacological and therapeutic properties are scientifically proven. WHO welcomes innovations all around the world for the search of potential treatment of COVID-19 which include traditional medicines and development of new therapies for treatment(15). According to WHO, corona virus is still prevailing and people should rely on the herbs for prophylactic use and immunity boosting.

WHO is working with collaboration of research institution for the selection of traditional medicinal products which can be exploited for their clinical efficacy and safety for the treatment of COVID-19 diseases(15).

The ministry of AYUSH has advised the use of 20 herbs during COVID-19 period which would help to prevent combat the action of COVID-19 virus on the body through various mechanism(16). Table no. 1.5.1 summarizes the brief discussion about these herbs.



Table

Sr. no	Name	Chemical constituents	Anti COVID -19 Activity
1.	Ashwagandha	Withanone, Withaferin A, withanolide A to Y	Blockage of spike protein ability of SARS-Cov-2 to bind with host cell receptor
2.	Guduchi	Tinosporin, tinosporide, cordifolide	Immunomodulator, anti-inflammatory
3.	Kalamegha	Andrographolide, neoandrographolide	Antiviral, immunity booster
4.	Tulsi	Bornylacetate, cadinene, eugenol	Antiviral, antifungal
5.	Vana tulsi	Linalool, methyleugenol, methyl cinnamate, luteolin	Antiviral, antimicrobial, anti-spasmodic
6.	Tvak/ dalchini	Cinnamaldehyde, eugenol, benzaldehyde	Anti-complement activity, anti allergic activity
7.	Ardharka	Alpha curcumene, citral, citonellol, gingerol	Antibacterial, anti-histaminic, bioavailability enhancer
8.	Haridra	Curcumin, curcane, cineole, eugenol	Antibacterial, antioxidant anti-inflammatory, antiseptic
9.	Amalaki	Phyllembin, Vitamin C, linolic acid, indole acetic acid	Antibacterial, antimicrobial, antioxidant anti-inflammatory
10.	Kiratatika	Awarogetin, gentiopicrin, chiratol, swerchirin	Antipyretic, antiarthritic
11.	Yashtimadhu	Glycyrrhizin, glycyrrhizic acid, liquirtin	Inhibition of replication of isolates of SARS virus,
12.	Nimba	Azardirachtin, nimbin, nimbandiol, nimbidin, sitosterol	Immunostimulant, anti-inflammatory
13.	Vasa	Vasicine, vascine, beta sitosterol	Beneficial in management of critical inflammatory stages of COVID-19
14.	Sathi	Hedychenone, 7- hydroxy hedychenone	Anti bacterial, antifungal, anti-inflammatory
15.	Puskaramula	Alantolactone, iso alantolactone, inulinolide	Anti bacterial, antifungal, anti-inflammatory
16.	Bharngi	Hispidulin, scutellarein, uncinatone	Anti histamine, anti pyretic
17.	Lavanga	Beta- caryophyllene, eugenol, furfural	Anti-viral, bactericidal, fungicidal
18.	Lamajjaka	Piperitone, borneol, cardinene, camphene	Diaphoretic, stimulant, anti oxidant
19.	Katuki	Kutkiol, kutkisterol, kutkin	Antipyretic, anti inflammatory, reduces asthmatic attack
20.	Anas Phal	Sesquiterpenes, shikimic acid, phenylpropanoids	Antiviral, antifungal, antibacterial

Table no. 1.5.1 : Brief summary of medicinal plants approved by Ministry Of AYUSH(16)

2. Introduction

The COVID-19 pandemic period since 2019 has once again drawn out attention towards bioterrorism. Peoples are now a day focusing themselves to increase their body immunity to fight such unexpected situations As prevailed during COVID-19 pandemic more and more money is being sanctioned on research related to immunity boosting. India is now focusing its attention on the ancient herbs and exploring the possibilities of such herbs to be used as immunity boosters. Newer formulations claiming to have immunity boosting properties have been introduced into the market. Many of them claim to be under the category of food supplements while some of them came under the category of non prescription drugs. As a result common man is under a confused state of mind regarding whether to use such formulations in day to day life or not. Recently there is no strict regulations on the sale and use of these formulations, neither there is price control on them making the situation even more complicated. There was an outbreak of SARS-CoV-2 as pneumonia in Wuhan, city of China, in December 2019. The people were infected with this deadly virus, which was later

renamed as COVID-19 by WHO. Confirmed cases reached up to 37,423,660 in around 200 countries, including approximately 1,074,817 deaths as of October 12,2020. Initially, it was declared as public health emergency at International level(17) Simultaneously, testing of herbs is done to minimize the corona-related infections(18). From our ancient times we are using herbs and spices for their various beneficial properties like antioxidant, antiviral, antimicrobial activities and their fruitful effects on human beings. Herbs mainly contain many bioactive compounds such as flavonoids, phenolics, tannins, alkaloids, sulfur contain compounds⁷. The properties of turmeric are also mentioned in Yajurveda to Charaka and Sushruta Samhita(19).

India has six recognized programs of medicine i.e yoga, Unani, Ayurveda, Siddha, naturopathy and homeopathy Ayurveda means science and not only as ethno-medicine, but also a complete medical plan to lead a healthy and happy life. In India, there is a record of about 20,000 plant species with medicinal properties(20).

The disastrous event is outbreak of SARS-CoV-2. The treatment for coronavirus is little specific. A global need is to search for capable agents of fighting against SARS-CoV-2(17). As an effort to strengthen our immunity during COVID-19, The Ministry of India, AYUSH, has issued a recommendation on the characteristics of Ayurveda Immune-promoting methods for self-care during the COVID-19 pandemic, including the use of spices like cumin, coriander, turmeric, and garlic recommended in cooking(1). It was recommended to drink basil, cinnamon, herbal tea/decoction (kadha) black pepper, raisins, and ginger at least once or twice a day(1). Guruchi, ashwagandha, haldi and many other herbs can prevent cytokinin storm in the body and can reduce or cure inflammation(20,21). Hence these were used to reduce respiratory inflammation in COVID-19 pandemic.

This article includes scientific studies on antiviral activities of derivatives of spices and herbs, mechanisms of action, and prospects for future work combined with survey-based analysis¹. The fig 2.1 represents various immunity boosters.



Fig 2.1.1: Common spices and herbs showing antiviral properties(22)

2.1 Turmeric: Turmeric having name *Curcuma longa* L. consists of rhizomes, belongs to the ginger family i.e Zingiberaceae and naturally grows in Southeast Asia and India(23). Its rhizomes contain various secondary metabolites of plants. Major bioactive are curcuminoids, sesquiterpenes, steroids and polyphenols substances Curcumin is a polyphenol isolated from turmeric (*Curcuma longa*) and for treating various disorders, it has been used as a traditional medicine in Asia for centuries. Several studies have shown that curcumin has some pharmacological properties like anti-angiogenic, anti-inflammatory, and anti-neoplastic, with low toxicity^{8,9}. Curcumin is also used to cure alzheimer’s disease(24,25).

The Food and Drug Administration (FDA) calls it “Usually Recognized as safe.” The dose up to 12 g/day is considered as safe for human consumption during clinical trials, without any side effects. With a dose of 2,500 to 8,000 mg per day for 3 months, no toxicity was shown by curcumin. It is an antiviral that helps in the reduction of the replication of viruses. The antiviral activity of curcumin was observed against different diseases including SARS coronavirus(26), hepatitis viruses, human immunodeficiency virus (HIV), flu viruses, herpes simplex virus, Dengue virus, chikungunya virus^{10,11}.



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2.2 Cinnamon: Cinnamomum cassia is tree species, which is aromatic, belongs to the Lauraceae family. Traditionally it has been used in Persian, Indian and Unani medicines. All around the World, it has been used as a spice popularly. It is collected from the bark of its young branches. It can also be used as a material for medical products with high economic value. For various medical conditions like, amenorrhea flatulence, leukorrhea, toothache, diarrhea, commoncold, fever and headache. It is also reported that the regular use of cinnamon combat throat related infections. Ojagh et al proved that the bark of cinnamon is composed of 21 chemical compounds, which include cinnamaldehyde and eugenol. Various scientific studies have revealed several properties like, antiviral, antimicrobial, antifungal, antidiabetic, gastroprotective, antitumor and antihypertensive, antioxidant immunomodulatory effects. According to study, phagocytic index is increased by higher dose of cinnamon and its low dose helps in the improvement of serum immunoglobulin levels. So, cell-mediated and humoral immunity is increased by higher dose, while its low dose affects humoral immunity only^{1,12}.

2.3 Giloy: Tinospora cordifolia (giloy) belongs to the Menispermaceae family and is commonly found in regions of Asia, such as India, Myanmar, Sri Lanka, China. It is native plant of India which is medicinal, common name is Guduchiand and used in Ayurvedic practice as a medicine for treating several diseases. Because of its medicinal value, T. cordifolia has been severely exploited for commercial purposes and has been used as an effective remedy for many ailments such as urinary incontinence, jaundice, skin diseases, diabetes, anemia, inflammation, allergies. Different parts of T. cordifolia, like the stem, leaves, root, flower, seed, and so on, have all of the above medical properties. This plant is also used in Ayurvedic "Rasayanas" for improving the immune system and the immune system diseases.

2.4 Black pepper: it is included in the spices due to its smell. It is mainly found in tropical areas like India, Indonesia. Its name is Piper Nigrum, and it has massive biological residences. Its bioactive compounds were used in various systems of medicines like Ayurveda, Unani or Siddha system. It was used as medication or as a preservative. Its main constituent is piperine, and it is responsible for various pharmacological activities like antidepressants, antiplatelets, antihypertensive, anti-inflammatory, antioxidants, antipyretic, analgesics, antimicrobials and so on¹³.

3. Methodology: A questionnaire online survey has been conducted on the potential use of herbs especially turmeric in combating coronavirus infection. The survey has covered NCR regions and respondents were males and females of different age groups (10-60 years) and of different professions (medical, paramedical, others). An online questionnaire was circulated through social media (e.g whatsapp and facebook) across NCR region. The questionnaire was designed at Google Forms Platform. Participants were encouraged to fill the response and to circulate form among their relatives and family members. However, to avoid exaggerated data, the response limit was set to one response only.

3.1 Data Collection: The questionnaire consists of sociodemographic variables including gender, age, profession and area of residence. The questions include Q.1 Ministry of AYUSH released guidelines for using immunity boosters containing ayurvedic herbs like turmeric. Do you agree? Q.2 In the prevention and treatment of COVID-19 infections, can CORONIL kit prevent or treat COVID-19 infection? Q.3Do you think that ancient ayurvedic herbs like cinnamon, aswagandha, turmeric etc. have immunity boosting ability within them? Q4which statement about turmeric, do you think is true? a. it is only beneficial as antiseptic in the form of fresh rhizomes b. processed powder of turmeric is equally beneficial c. turmeric powder cannot be used as antimicrobial agents. no idea Q.5 turmeric is added in some bath soaps for: a. its beautifying properties b. its antiseptic action on skin c. its antiseptic action on skin. none of the above Q.6 can the turmeric containing preparations be used daily to prevent COVID-19 infections?Q.7 Ministry of AYUSH says that gargling with warm water having turmeric is beneficial for preventing coronavirus infection. Do you agree? Q.8 Can our ayurvedic medicines substitute the allopathic therapy used against COVID-19 infections? Q9 Can turmeric be used as antiseptic? Q.10 Use of turmeric in Ayurvedic medicines is a?

3.2Data Analysis: For the analysis purpose, some statistical methods are used. According to responses bar and pie charts are plotted.

4. Results and Discussion-

Among 183 respondents 49.7% were females and 50.3% were male, 28.6% belong to the medical profession while 24.9% belong to paramedical profession and 46.5% belong to any other profession, Most respondents were belonging to urban i.e. 54.6% while other from rural areas of the age group of 21-40 years(76.8%) .

The dataset was prepared and chi-square test was applied, in Q. 1, the guidelines released by Ministry of AYUSH had a significant relationship with gender, $X^2(2,n=185)=7.906, p=0.019$, The opinions of men and women were different towards the guidelines. In Q 5 turmeric is added in some bath soaps, had a significant relationship with area, $X^2(3,n=185)=8.909, p=0.031$ urban people's opinions were different from rural persons. Opinions were also different according to profession, $X^2(6,n=185)=14.145$,

$p=0.028$ paramedical professionals responded differently as compared to other professionals. The p values less than 0.05 indicate that there is a significant difference in opinion of people i.e. according to Q.1 there is opinion difference between males and females and p value is 0.019. The p values more than 0.05 indicate there is small difference between the opinion of people of either profession or of either area.

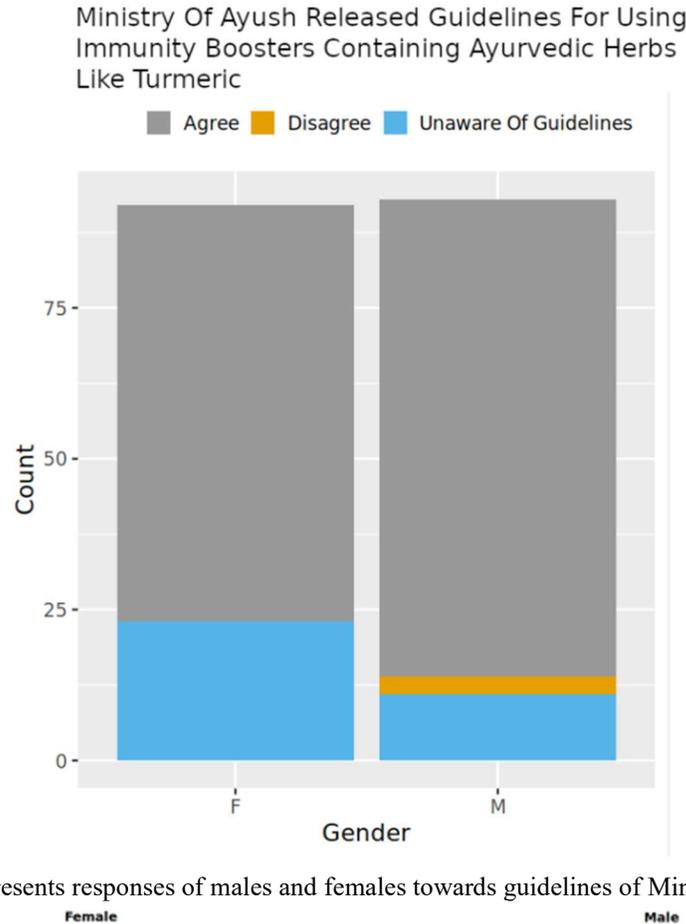


Fig 4.1 represents responses of males and females towards guidelines of Ministry of AYUSH

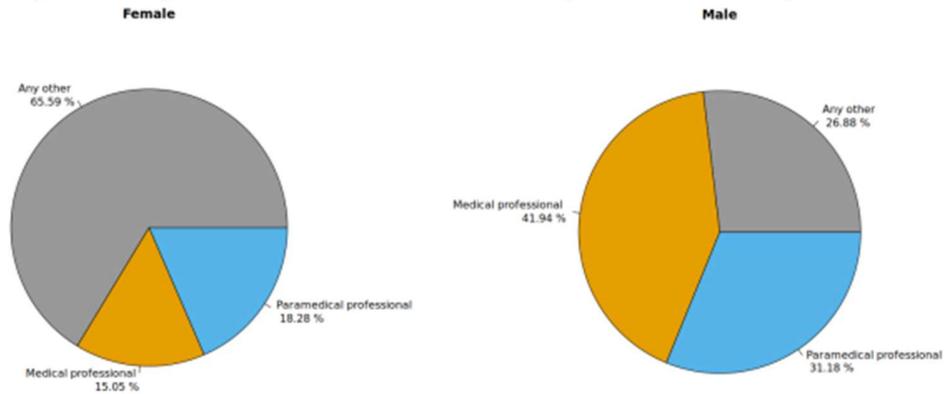


Fig 4.2: pie charts showing profession of the participants

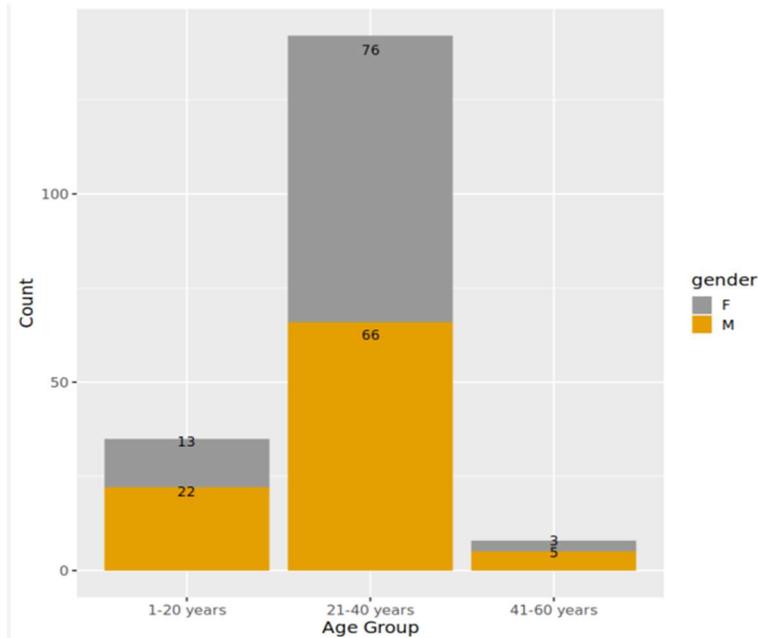
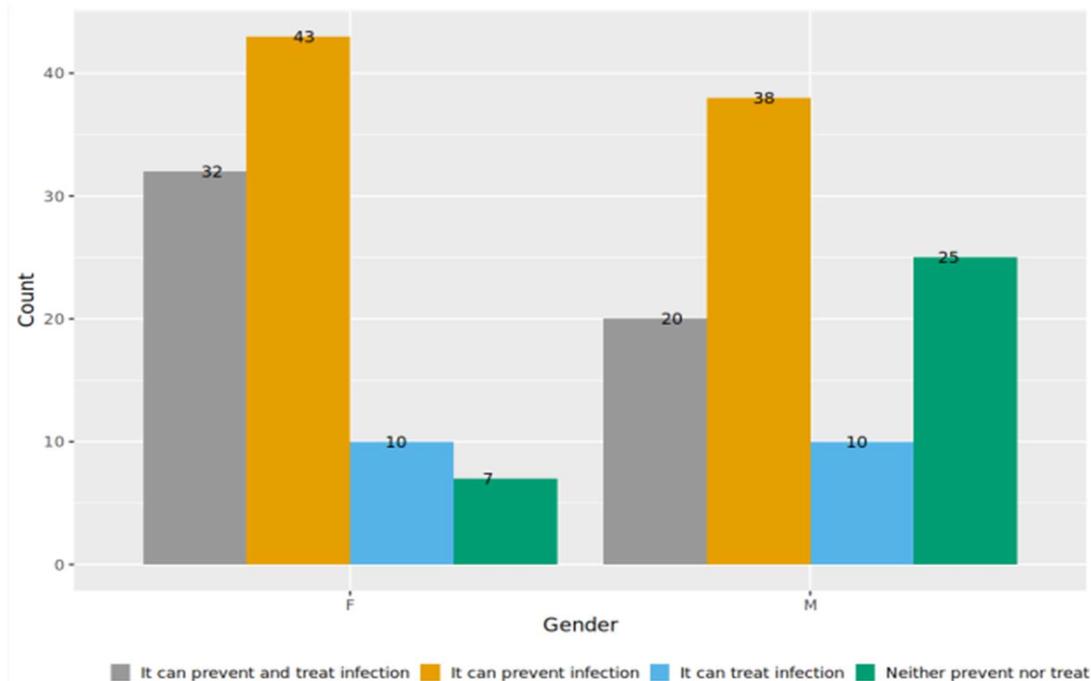


Fig 4.3: bar plot showing age group of the participants



CORONIL kit prevents or treats COVID 19 infection

Fig 4.4: represents responses of male and female towards 'Coronil' kit.

5. Discussion:- According to results people trust on turmeric as beneficial for their health or immunity. This survey was conducted just because to know the mentality of people towards herbs. In the starting of this corona pandemic period, there was no specific guideline or treatment to combat or control the disease spread by this virus. Our Ministry of AYUSH faced a lot of pressure for finding the specific treatment for the COVID-19 pandemic, in response to that guideline were realed by Ministry of AYUSH to boost



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immunity of people. During this period ‘CORONIL’ was launched by Patanjali. According to survey female show more trust regarding “Coronil kit” that it can prevent infection. As shown by the results, the responses were different for different sex, age group, profession and area. The responses showed that most people trust on herbs as immunity booster. However, the people belonging to the profession other than paramedical or medical field did not know about the guidelines issued by Ministry of AYUSH. One reason behind may be the psychology of man that he should know everything or may be another reason.

6. Conclusion: Many food products, supplements and medicines whatever in the category of prescription and non prescription drugs were launched into the market with claim to improve immunity of people. Some of the claim were authentic and had a support of scientific data while some other claims were baseless, false and misleading. Although the market of such products witnessed a steep increase during this period, people were afraid of the spread of disease and confused at the same time about which product to use in such a situation. The present study highlighted bewildered state of mind of common masses.

The laws and regulation were not sufficient to stop such false claims, hence the present regulations should be amended in away way to keep a constant check on such false claims.

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