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Knowledge About the Effects of Medicinal Plants Against COVID-19 Among Dental Students - A Questionnaire Study

Vikraman K S[1], Abilasha[2], Kavitha S[3]

[1]Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India; [2]Reader, Department of Oral and Maxillofacial Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India; [3]Lecturer, Department of Biochemistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.

ABSTRACT

Background and Aim: Natural herbal medicines have long been an important cure/remedy in traditional Indian practices for treating various diseases. The current study aims at assessing the knowledge about medicinal plants and their effect on COVID-19 in dental students to understand the effects and advantages of using medicinal plants against such diseases.

Materials and Methods: This cross-sectional survey was initiated among dental students in a private dental institution, Chennai; about the effects of medicinal plants against COVID-19. Nearly 100 students responded to the survey. Data have been collected with help of SPSS software and data has been analyzed and plotted in graphs. Inferential statistics was done using the Chi-square test and a p-value of < 0.05 was considered statistically significant.

Results and Conclusion: More than 80% of the population were aware of the effects of medicinal plants against COVID-19. Few parameters like mode of transmission, diseases related to coronavirus, and diagnostic test for COVID-19 were associated with the gender of population and it is found that males were more aware than females, even though there was no statistical significance.

Conclusion: The future scope of this study is to gain knowledge about the effect of natural medicinal plants against COVID-19 and also to investigate the effects of the plants for therapeutic use.

Key Words: COVID-19, Medicinal plants, Effects, Spread, Treatment measures, Home remedies

INTRODUCTION

Coronavirus is an RNA virus and it has a crown-like appearance and spike glycoprotein envelope belongs to the subfamily orthocoronavirinae, there are four genera of coronaviruses, Betacoronavirus, Alpha coronavirus, Gamma coronavirus, and Deltacorona infection[1]. This coronavirus is composed of four structural proteins, including spike (S), envelope (E), as a membrane (M), and nucleocapsid (N) proteins[2,3]. It is an infectious disease caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2)[4]. Many infections also cause oral lesions, especially in older individuals[5]. It was first identified in December 2019 in Wuhan, China and has since spread globally, resulting in an ongoing pandemic [6]. Common symptoms of COVID-19 include fever, cough, fatigue, shortness of breath, and loss of smell and taste as per the recent publications[7]. Some viral transmission may also occur through saliva which can be used as a diagnostic tool[8]. China promptly announced the pestilence to the World Health Organization (WHO) and furthermore imparted the grouping data to the worldwide network to alert the people in various regions of the world. WHO has helped in the development of the diagnosis; issued guidelines for patient monitoring, sample collection, and treatment; and provided up-to-date information on the epidemic on a continuous basis[9]. In spite of the extensive research done the source of the virus and its ability to spread still remains ambiguous, with an increasing number of cases showing signs of human-to-human transmission[10,11]. In spite of the trials conducted all over the world, there is no particular treatment measure developed for the prevention or treatment of COVID-19. Hence, we in this article have aimed to impart knowledge and assess the same on the effectiveness of the various herbal

Corresponding Author:

Dr. Abilasha, Reader, Department of Oral and Maxillofacial Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India; Email:abilasha@saveetha.com

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concoctions and medicinal herbs on COVID-19. Herbal therapeutic items are restorative items where the dynamic fixing comprises only of homegrown substances or homegrown preparations. Natural cures are restorative items where the dynamic fixing is of the common starting point and comprises a creature section, a bacterial culture, a mineral, or a salt[12]. The aim of the study is to make aware and to assess the knowledge of dental students about the effects of natural medicinal plants against COVID-19 and to resolve the myths about the usage and effects of medicinal plants.

MATERIALS AND METHODS

A cross-sectional survey was initiated among the dental students in Chennai city. Ethical clearance was obtained from the Institutional Review Board of Saveetha Dental College. (No.SRB/SDC/BDS/002/03) Nearly 100 people responded from the study group and the survey data was collected and only the responses from the dental students were considered. Data collection was done through software using Google form: https://docs.google.com/forms/d/e/1FAIpQLSduqhEa020t0zgztaCzuARU-fKeQwFnbUptWW6sasuL_1jHw/viewform?usp=sf_link. Results were analyzed and represented in the form of bar graph and pie-charts. A list of dependent variables is knowledge in universal precautions. A list of independent variables is age and sex.

Statistical Analysis

Association between various parameters and the gender of the participants was done using Chi-square test, using SPSS software. $p< 0.05$ was considered to be statistically significant.

RESULTS AND DISCUSSION

100 people participated in this survey. Data was collected with help of online Google forms and responses obtained were collected, analyzed, and plotted as a graph. The study showed that more than 80% of people are aware of COVID-19 and the effects of medicinal plants against COVID-19. Graph 1 shows the response for the full form of COVID-19, 88% of the population opted for coronavirus disease 2019, and 7% of the population as coronavirus disorder 2019 and 5% answered as coronary artery disease 2019. Graph 2 shows knowledge about where coronavirus was first identified in 78% of the population answered as Wuhan, Hubei, and 13% as Hubei, Hunan, and 1% as Xiaogan, and 7% as Jinan, Shandong. Graph 3 shows the opinion for the reason why the virus is named corona. 56% of the population and 4% due to their surface structure of bricks and 39% as both crown-like and surface structure of bricks and 1% due to leaf-like projection. Graph 4 shows the opinion for the reason how the person gets infected by a coronavirus, 5% as touching a contaminated surface and 9% as small droplets produced during coughing and sneezing or talking and 84% as both first and second and 2% as none of these. Graph 5 shows the diseases which are related to coronavirus are 69% of population answered as both SARS and MERS and 18% as SARS and 5% as MERS and 8% as none of above. Graph 6 shows the response for who is at the risk of developing severe illness, 7% of the population selected older people, 10% selected person with pre-existing medical conditions such as high blood pressure and heart disease, and 14% as person close contact with the infected individual and 69% as all of the above. Graph 7 shows the response for the time frame of the incubation period of coronavirus, 5% of the population opted as 2 to 4 days and 81% as 1 to 14 days and 5% as 1 to 5 days and 9% as 2 to 28 days. Graph 8 shows the response for whether COVID-19 is the same as SARS, 57% of the population as Yes and 43% as No. Graph 9 shows the response for the correct diagnostic test for COVID-19, 82% of the population answered as RT-PCR and 6% as chest x-ray and 7% as ELISA, and 5% as GFR test. Graph 10 shows the knowledge about the recommended source to get information about COVID-19,7% as Google and 53% as WHO and 7% as WhatsApp group and 33% as all the above. Graph 11 shows the response for the knowledge about the myths about coronavirus are 22% as eating garlic help prevent with noble coronavirus and 13% as I will die if I am diagnosed with coronavirus and 54% as both A and B and 11% as none of the above. Graph 12 shows the responses about whether our natural medicinal plants have some effects against COVID-19.8% as Yes and 12% as No. Graph 13 shows the knowledge about whether the medicinal plants improve our immune system against coronavirus, 85% of the population opted as Yes and 15% as No. Graph 14 shows the responses of whether medicinal plants are given directly *in vivo*, 64% of the population opted for Yes and 36% as No. Graph 15 shows the response for whether ginger protects us from COVID-19, 64% answered as Yes and 36% as No. Graph 16 shows the responses for whether medicinal plants can be used in preparing masks, 53% of the population answered as true and 47% as false. Graph 17 shows the knowledge about whether the usage of traditional medicine against coronavirus has side effects, 21% as Yes and 55% as No and 24% as may be. Graph 18 shows the knowledge about whether Kabasura kudineer will help in increasing immunity, 90.8% of the population as true, and 9.2 as false. Graph 19 shows the responses about which plant targets the viral replication of coronavirus and slows down, 11% of the population as *Glycyrrhiza glabra* and *Allium sativum*, and 25% as none of the above. Graph 20 shows the responses for which plant extract can be used against COVID-19, 43% as *Vitex trifolia*, 11% as hibiscus,

5% as Aloe vera, and 41% as none of above. Association between gender and other parameters about the knowledge of medicinal plants was analyzed using the Chi-square test (P value less than 0.05 as considered to be significant and greater than 0.05 considered as not statistically significant) and depicted in the following graphs from 21 to 30.

The spread of the virus is more virulent due to improper precautionary measures across all health disciplines due to a lack of empathy[13]. Due to the lack of treatment for many deadly diseases and infections, many medicinal plants help in the treatment of various problems like teeth sensitivity etc[14]. Currently, there are no effective treatments against coronavirus and the development of the treatment measures requires many months or years, hence we must be aware of the other treatment modalities of natural origin based on aromatic and medicinal plants which may play a role in inhibition the spread of COVID-19 [15]. The presence of SARS pushes a class of analysts to discover against coronavirus operators, including certain normal exacerbates that exist in homegrown medicines. Much illegal aspect has been happening against the natural medicine against COVID-19. Illegal practices can be due to an increase in medical negligence across all fields of healthcare [16]. Plants used against COVID-19 include *Indigo feratinctoria (AO), Vitex trifolia, Gymnema sylvestre, Abutilon indicum, Leucas aspera, cassia alata, Sphaeranthus indicus, Clitoria ternatea, Clerodendrum Inerme Gaertn, Pergularia daemia*, and *Evolvulus alsinoides*[17]. Many articles have referred to some of the articles that say that usage of metal nanoparticles like silver, zing in the existing wound dressing materials is not environment friendly due to its toxicity effect [17]. The elective condition well disposed of comparable materials, for example, liquorice, neem, turmeric, nectar, nigella, and so on natural herbs, have a significant effect due to their inherent medicinal properties. Few plants may also prevent hypomineralisation of tooth[18] The natural plant extract can be used to deactivate the active components of this virus[19] but this virus undergoes mutation according to climatic conditions according to different places it making it difficult for medicine[20]. As a contextual analysis, liquorice was chosen as an example to kill the action of infection proteins. Similar agreements are found in literature [21] that state "liquorice root extract is effective against HIV, RSB, and herpes viruses[22]. This virus affects people of different ages[23] and severe acute respiratory syndrome-related coronavirus which causes a serious type of pneumonia"[24]. Consumption of herbal medicine will prevent dental disturbances[25]. The contents of liquorice are glycyrrhizin, glycyrrhetic acid, liquiritin, and isoliquiritin[26] which are able to control the spreading of virus activity. In most of the countries, the body of corona infected persons was not subjected to post-mortem due to fear of handling the surgical specimen[27]. Previously our team had conducted many awareness studies on various dental problems and dental aids but none on the use of natural substances against diseases[28,29,30]. Evidence-based studies have a lot of impact on the present-day research in all fields[31,32].

According to our study, many responded that people do get infected by coronavirus by touching a contaminated surface and small droplets produced during coughing and sneezing or talking. In a similar context, a review states that viruses may be transmitted from one host to another host depending on coronavirus species by an aerosol, fomite or fecal-oral route[33] Disease related to corona 69% population answered as both SARS and MERS. A similar article states it is related to MERS-COV to several bats species[34]. Diagnostic test for COVID-19 has been identified by 82% of the population as RT-PCR which is the gold standard. According to the literature, Covid-19 tests include RT-PCR, isothermal nucleic acid amplification, antigen, and biopsy[35,36]. 53% of the population felt medicinal products can be used to make masks, in another article it is used as a disinfectant for killing germs in masks[37]. Kabasura kudineer will help in increasing immunity is believed to be true by 91% as, similar to the literature stating that Kabasura kudineer of fewer and virus epidemic[38].

CONCLUSION

The study shows that most dental students are moderately aware of the effects of natural and medicinal plants against COVID-19. The male population had more awareness than the female population. Owing to the multi-fold increase in the cases in the city[39], it is important for such studies on alternative medicines as therapeutic options to be performed in various populations in order to improve the current situation by decreasing the number of cases. Natural and home remedies are more economical and readily available to the common man, hence the propagation of knowledge about the various herbs and medicinal plants is essential. This study has been conducted in a limited population due to a shortage of time and the current pandemic situations and can be improved by including a wider population. The future scope of this study is to gain knowledge about the effect of natural medicinal plants against COVID-19 and also to investigate the effects of the plants for therapeutic use.

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Conflict of interest

Nil

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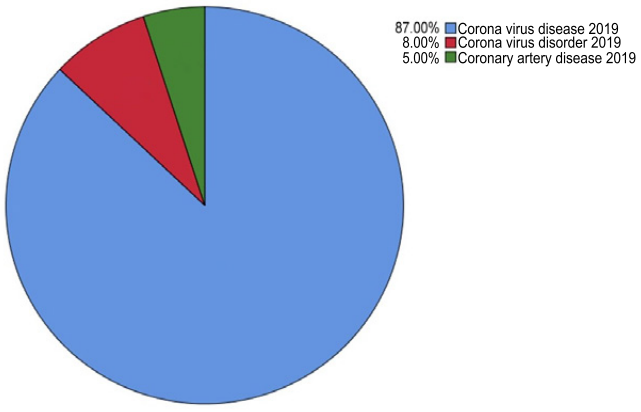

Figure 1: Pie-chart representing response for the awareness about full form of covid-19, 87% of population opted for coronavirus disease 2019 and 8% of population as coronavirus disorder 2019 and 5% answered as coronary artery disease 2019.

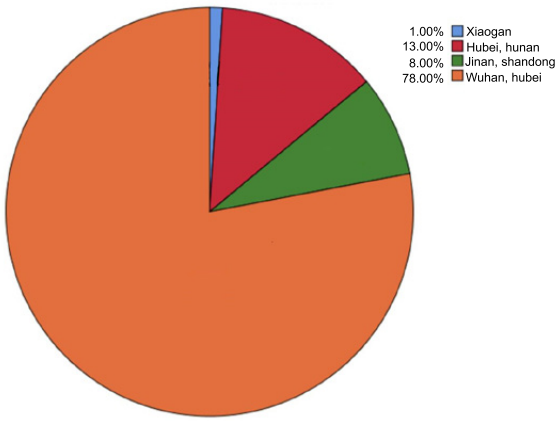

Figure 2: Pie-chart representing response for the awareness about the knowledge, the place where the virus was identified, 78% of population answered as Wuhan, Hubei and 13% as Hubei, Hunan and 1% as Xiaogan and 8% as Jinan,Shandong.

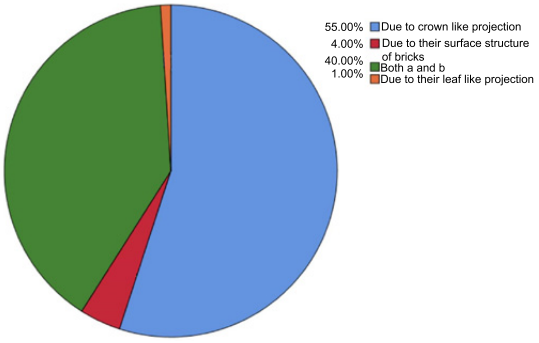

Figure 3: Pie-chart representing response regarding the reason why the virus is named corona, 55% of population felt its due to crown like projections, 4% as due to their surface structure similar to bricks and 40% as both crown like and surface structure of bricks and 1% as due to leaf like projection.

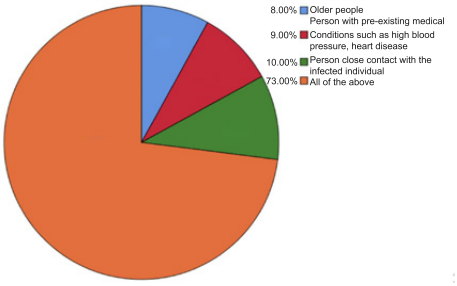

Figure 6: Pie-chart representing response for the awareness about the group of people who are a risk of developing the illness, 8% of population selected older people, 9% selected person with pre-existing medical conditions such as high blood pressure and heart disease and 10% as person close contact with the infected individual and 73% as all of the above.

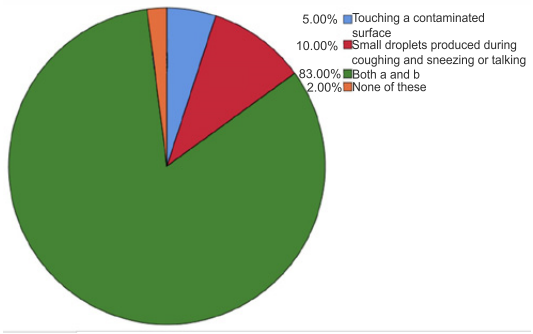

Figure 4: Pie-chart representing response for the awareness about transmission of coronavirus. 5% -touching a contaminated surface, 10% - small droplets produced during coughing and sneezing or talking and 83% - both first and second option and 2% - none of these.

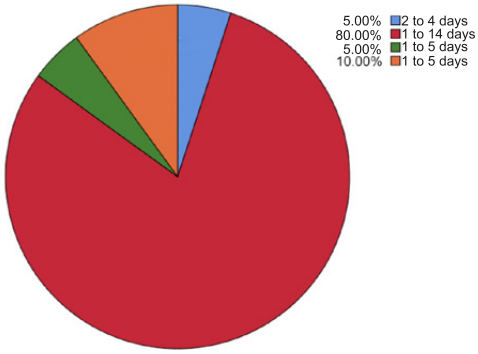

Figure 7: Pie-chart representing response for the awareness about the incubation period,5% of population oped as 2 to 4 days and 80% as 1 to 14 days and 5% as 1 to 5 days and 10% as 2 to 28 days.

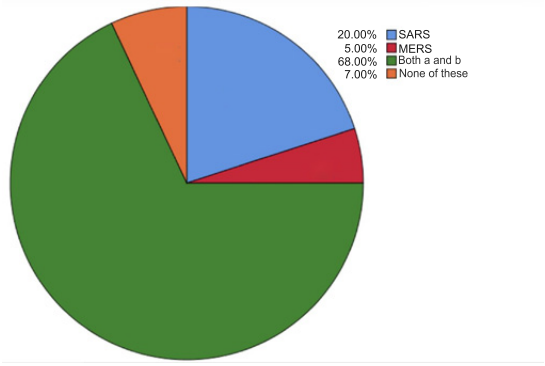

Figure 5: Pie-chart representing response for the awareness about disease related to coronavirus, 68% of population answered as both sars and mers and 20% as SARS and 5% as MERS and 7% as none of above.

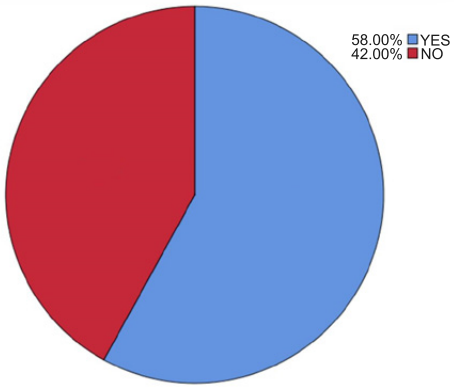

Figure 8: Pie-chart representing response for the awareness about whether covid-19 is the same as SARS, 58% of population as yes and 42% as no.

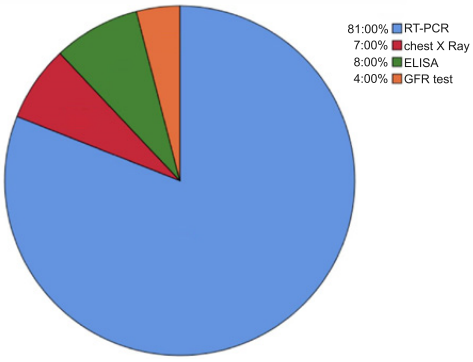

Figure 9: Pie-chart representing response for the awareness about the diagnostic tests,81% of population answered as RT-PCR and 7% as chest x-ray and 8% as ELISA and 4% as GFR test.

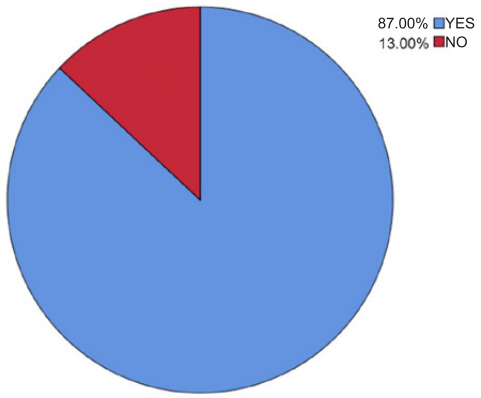

Figure 12: Pie-chart representing response for the awareness about the effects of medicinal plants against covid-19, 87% answered yes, they were aware and 13% answered no.

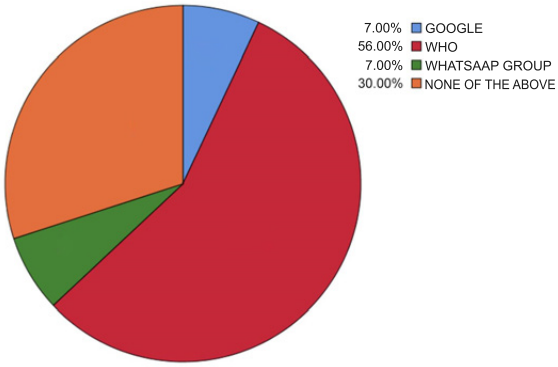

Figure 10: Pie-chart representing response for the awareness about the source of information, 7% as google and 56% as WHO and 7% as whatsapp group and 30% as all the above.

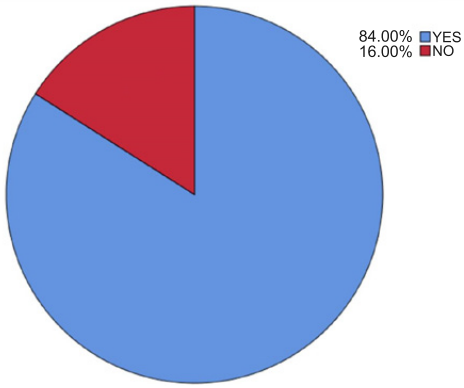

Figure 13: Pie-chart representing response for the awareness about whether medicinal plants improve immune system, 84% of the population opted as yes and 16% as no.

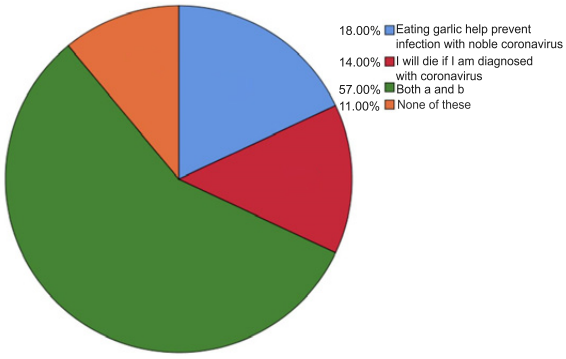

Figure 11: Pie-chart representing response for the awareness about the myths about covid-19,18% as eating garlic help prevent spread of coronavirus and 14% that they will die if diagnosed with coronavirus and 57% as both a and b and 11% as none of the above.

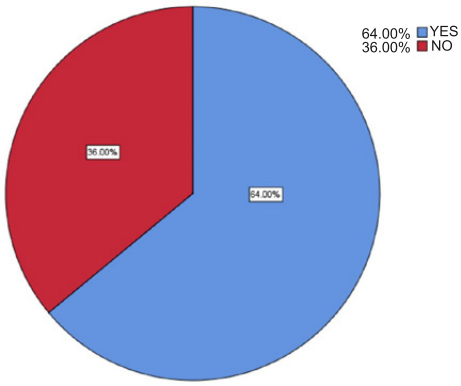

Figure 14: Pie-chart representing response for the opinion about whether the medicinal plants can be given invivo, 64% of population opted for yes and 36% as no.

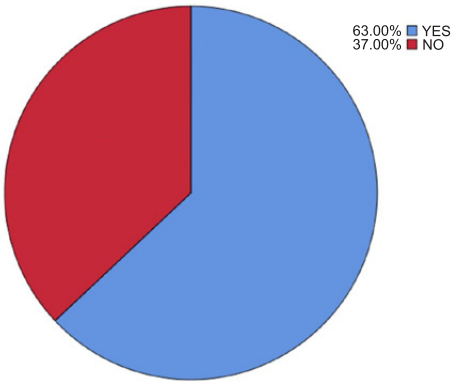

Figure 15: Pie-chart representing response for the awareness about whether ginger protects from covid-19,63% answered as yes and 37% as no.

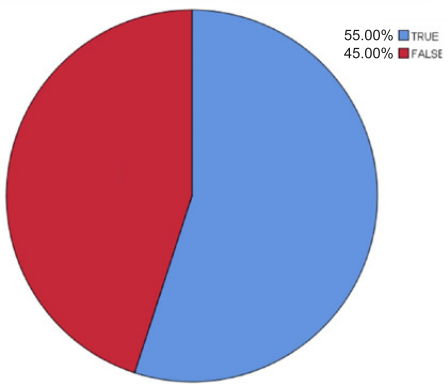

Figure 16: Pie-chart representing response regarding use of medicinal plants in mask preparation,55% of population answered as true and 45% as false.

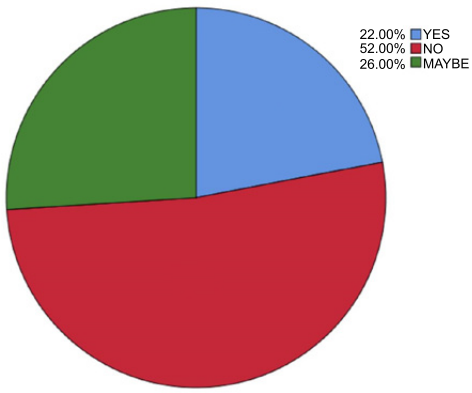

Figure 17: Pie-chart representing response for whether traditional medicinal plants have side effects,22% as yes and 52% as no and 26% as may be.

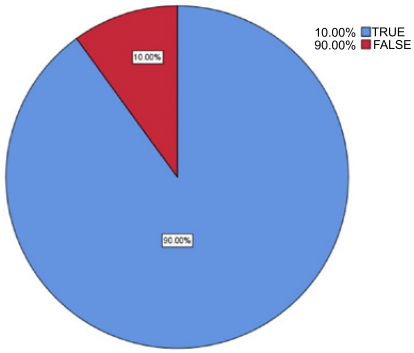

Figure 18: Pie-chart representing the opinion about the role of Kabasura kudineer in immunity boosting ,90% of population as true and 10% as false.

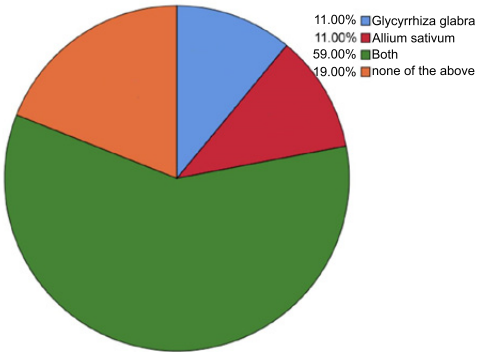

Figure 19: Pie-chart representing response for the awareness about the plants which target and prevent the viral replication,11% of population answered as glycyrrhiza glabra and 11% as allium sativum and 59% as both 19% as none of the above.

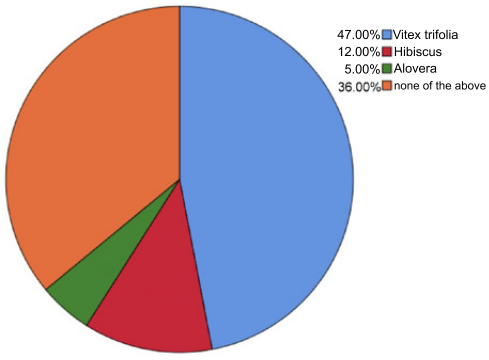

Figure 20: Pie-chart representing response for the awareness about the plants extracts used against covid-19,47% as vitex trifolia,12% as hibiscus,5% as aloe vera and 36% as none of above.

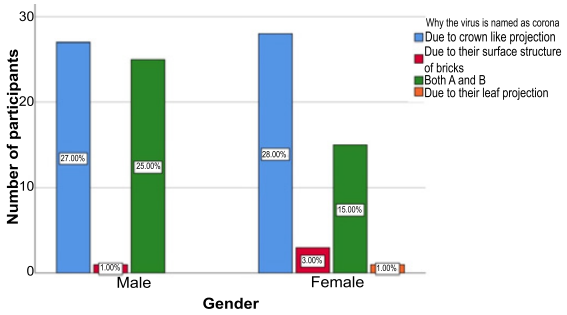

Figure 21: The bar graph represents the association between gender and knowledge of people about the reason for virus being named corona,X axis represents gender and Y axis represents number of responses.Blue denotes due to crown like projection,red denotes due to their surface structure of bricks and green denotes both A and B and orange denotes due to their leaf like projection.Females were more aware than males. Pearson's chi square test shows p value is 0.243(>0.05). Hence it is not statistically significant.

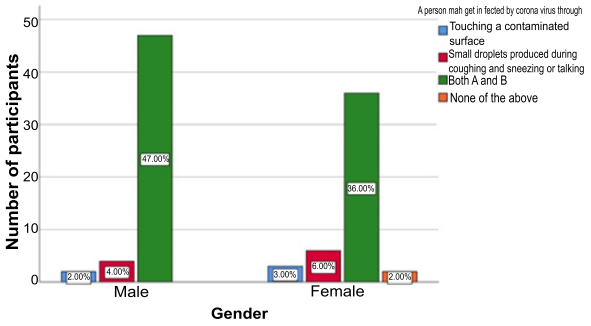

Figure 22: The bar graph represents the association between gender and knowledge of people about the reason for coronavirus spread through,X axis represents gender and Y axis represents number of responses.Blue denotes touching contaminated surfaces,red denotes small droplets produced during coughing, sneezing or talking and green denotes both A and B and orange denotes none of the above.Males were more aware than females.Pearson's chi square test shows p value is 0.294(>0.05).Hence it is not statistically significant.

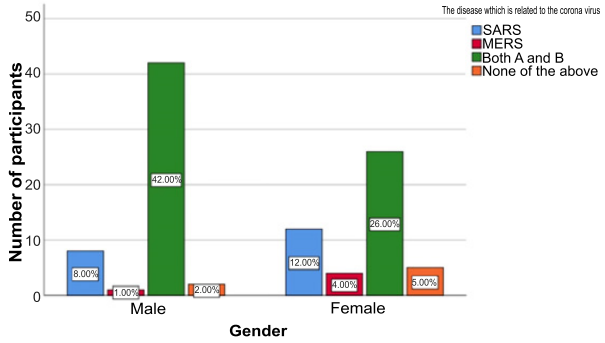

Figure 23: The bar graph represents the association between gender and knowledge of people about the diseases related to covid-19,X axis represents gender and Y axis represents number of responses.BluedenotesSARS,red denotes MERS and green denotes both A and B and orange denotes none of the above.Males were more aware than females.Pearson's chi square test shows p value is 0.602(>0.05).Hence it is not statistically significant.

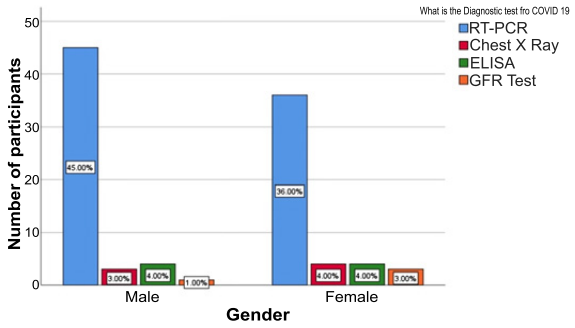

Figure 24: The bar graph represents the association between gender and knowledge of people about the diagnostic tests for covid-19,X axis represents gender and Y axis represents number of responses.Blue denotes RT-PCR ,red denotes chest x-ray and green denotes ELISA and orange denotesGFR test .Males were more aware than females.Pearson's chi square test shows p value is 0.617(>0.05).Hence it is not statistically significant.

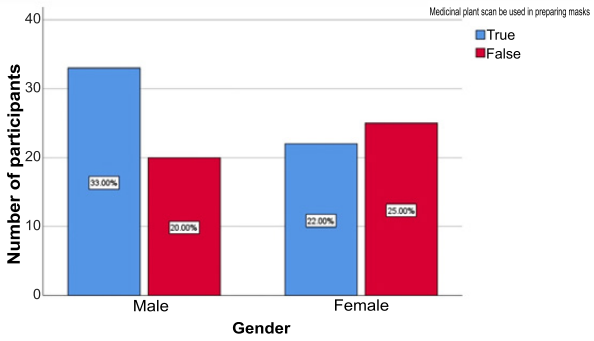

Figure 25: The bar graph represents the association between gender and knowledge of people about the natural medicinal plants used in mask preparation,X axis represents gender and Y axis represents number of responses.Blue denotes true ,red denotes false.Males were more aware than females.Pearson's chi square test shows p value is 0.121(>0.05).Hence it is not statistically significant.

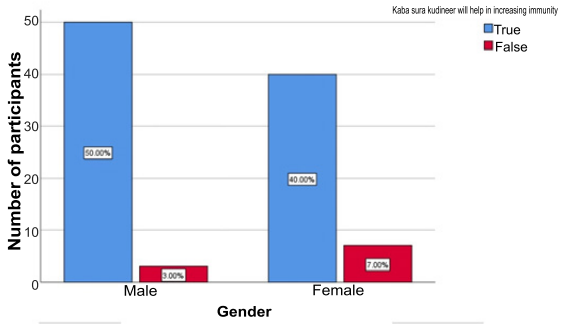

Figure 26: The bar graph represents the association between gender and knowledge of people about Kabasura kudineer will increase immunity,X axis represents gender and Y axis represents number of responses.Blue denotes true ,red denotes false.Males were more aware than females.Pearson's chi square test shows p value is 0.125(>0.05).Hence it is not statistically significant.

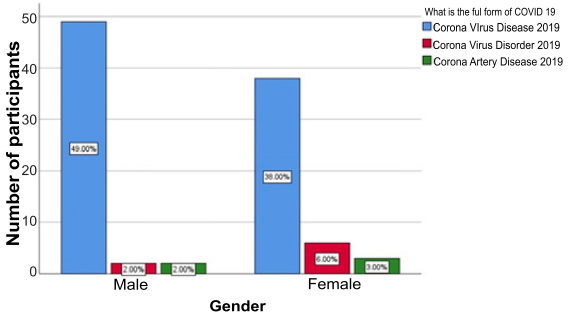

Figure 27: The bar graph represents the association between gender and full form of covid-19,X axis represents gender and Y axis represents number of responses.Blue denotes coronavirus disease 2019,red denotes coronavirus disorder 2019 and green denotes coronary artery disease 2019.Males are more aware than females.Pearson's chi square test shows p value is 0.198(>0.05).Hence it is not statistically significant.

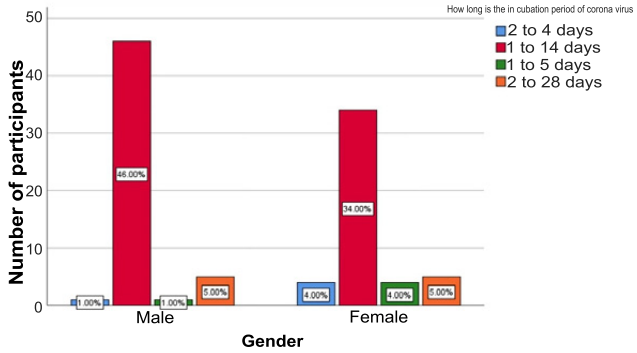

Figure 28: The bar graph represents the association between gender and incubation period of covid-19,X axis represents gender and Y axis represents number of responses.Blue denotes 2-4 days ,red denotes 1-14 days and green denotes 1-5 days and orange denotes 2-28 days. Males were more aware than females.Pearson's chi square test shows p value is 0.168(>0.05).Hence it is not statistically significant.

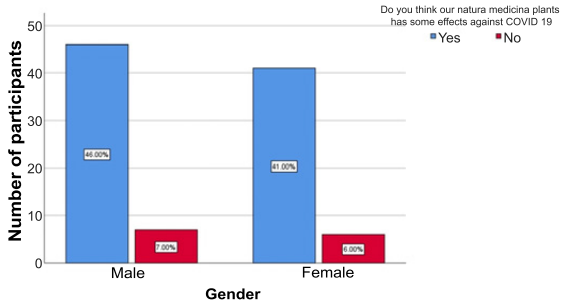

Figure 29: The bar graph represents the association between gender and does medicinal plants have effects against covid-19, X axis repressed gender and Y axis represents number of responses.Blue denotes yes,red denotes no. Males were more aware than females.Pearson's chi square test shows p value is 0.948(>0.05).Hence it is not statistically significant.

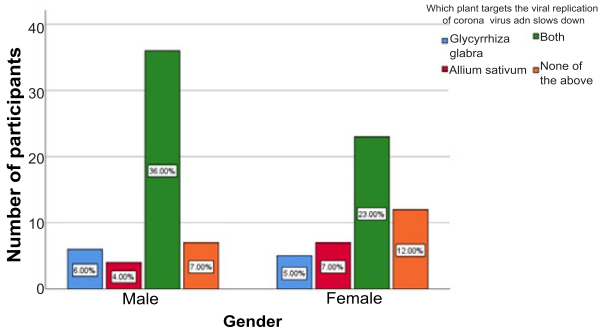

Figure 30: The bar graph represents the association between gender and medicinal plants which target viral replication, X axis repressed gender and Y axis represents number of responses.Blue denotes glycyrrhizaglabra,red denotes Allium sativum, green denotes both and orange denotes none of the above.Males were more aware than females.Pearson's chi square test shows p value is 0.121(>0.05).Hence it is not statistically significant.

QUESTIONNAIRE

Effect of Medicinal Plants against COVID-19

1. What is the full form of COVID-19 ?
   #Corona virus disease 2019
   #Corona virus disorder 2019
   #Coronary artery disease 2019
   #None of the above

2. Corona virus was first identified in
   #Xiaogan ,
   #HubeiHunan
   #Jinan,Shandong
   #Wuhan, Hubei

3. Why the virus is named as corona ?
   #Due to their crown-like projections
   #Due to their surface structure of bricks
   #Both a and b
   #Due to their leaf like projection

4. A person may get infected by corona virus through
   #Touching a contaminated surface
   #Small droplets produced during coughing and sneezing or talking
   #Both a and b
   #None of the above

5. The disease which is related to the corona virus are
   #SARS
   #MERS
   #Both a and b
   #None of the above

6. Who is at risk of developing severe illness
   #Older people
   #Person with pre-existing medical conditions (such as high blood pressure , heart disease .etc)
   #Person close contact with the infected individual
   #All of the above

7. How long is the incubation period of corona virus
   #2 to 4 days
   #1 to 14 days

#1 to 5 day
#2 to 28 days

8.COVID 19 is same as SARS
#Yes
#No

9.What is the Diagnostic test for COVID-19
#RT-PCR
#Chest X Ray
#ELISA
#GFR test

10.Recommended source to get information about COVID-19
#Google
#WHO
#Whatsapp group
#All of the above

11.Myths about corona virus are
#Eating garlic help prevent infection with noble coronavirus
#I will die if I am diagnosed with coronavirus
#both a and b
#None of the above

12.Do you think our natural medicinal plants has some effects against COVID- 19
#Yes
#No

13.can medicinal plants improve our immune system against corona virus?
#yes
#no

14.can medicinal plants be given directly in vivo
#yes
#no

15.can eating ginger protect us from COVID-19
#Yes
#No

16.Medicinal plants can be used in preparing masks?

#true
#false

17.Wheather usage of traditional medicine against corona virus have side effects?
#yes
#No
#maybe

18.kabasura kudineer will help in increasing immunity?
#true
#false

19.Which plant targets the viral replication of corona virus and slows down?
#Glycyrrhiza glabra
Allium sativum
#both
#none of above

20.Amonge these which plant extract can be used against covid-19
#Vitex trifolia
#Hibiscus
#alovera
#none of above