Determinants of socio-demographic and environmental barriers in prevention of COVID-19 pandemic

Mansi Atri¹, Roomani Srivastava², Sukhvinder Singh Oberoi¹, Minni Chadha³, Shweta Rastogi¹, Neha Maurya⁵, Sharad Tiwari⁵

¹Associate Professor, Public Health Dentistry, ESI Dental College, Rohini, Indraprastha University, Delhi, India, ²Tutor, Oral Surgery, ESI Dental College, Rohini, Indraprastha University, Delhi, India, ³Director Professor, Periodontology, ESI Dental College, Rohini, Indraprastha University, Delhi, India, ⁴Assistant Professor, Conservative Dentistry, ESI Dental College, Rohini, Indraprastha University, Delhi, India, ⁵Intern, ESI Dental College, Rohini, Indraprastha University, Delhi, India

ABSTRACT

Aim and Objectives: This study assessed the knowledge, attitude, and practice of patients with ESIC, who are insured patients with the public health sector about COVID-19. Materials and Method: This was a cross-sectional observational study that used a questionnaire developed for the purpose of the survey. The questionnaire was divided into five parts including the demographic variables and environmental variables that are enablers for positive preventive practices of COVID-19, knowledge, attitude, and preventive practices followed with respect to COVID-19. Results: The mean age of the study population was 36.96 ± 13.05 (18–73) years with almost an equal proportion of males and females. The knowledge about measures to be taken for prevention of corona infection such as Balanced diet, Lockdown, Social distance, frequently wash hands often, using face mask and regularly cleaning with disinfectant surfaces was significantly better among females. Majority of the subjects displaying good attitude toward the corona disease prevention. Preventive practices were found to be satisfactory among the study population. Use of soap and handwashing was more than the use of sanitizer. Hand washing, use of mouth mask, and taking bath after returning home from outside was significantly better among males. Conclusion: There are increased worries and apprehensions among the public regarding acquiring the COVID-19 infection. People have higher perceived needs to deal with their anxiety towards acquiring the infection.

Keywords: Anxiety, balanced diet, COVID-19, lockdown, sanitizer, social distance

Introduction

Delhi and National Capital Region (NCR) has one of the highest population density of nearly 2200/m² in the country. With COVID-19 spreading at a rapid pace in the region and the surrounding areas, there lies the threat for a serious outbreak because of the challenges for the implementation of the social distancing and inadequate basic sanitation viz. access to clean water and soap for handwashing. The matters are further complicated by presence of large numbers of migrant community from various states across the country.¹,²

Though, there have been a lot of national measures in overcoming the outbreak, the outcome mainly depending on the behavior of the public. Specifically, the public adherence to the preventive measures as directed by the government is very important for the prevention of the disease transmission. Adhering to the protocols is majorly influenced by the knowledge and attitudes of the public toward COVID-19 which has been established by evidence.³,⁴ The assessment of the general public’s awareness and knowledge about the coronavirus, in-depth knowledge into the already perception and practices of the public can be gained.

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This can help in the identification of the necessary characteristics that have influence upon public for the adoption of the healthy practices and responsive behavior.\(^9\)

Like any infectious disease, the predictors of COVID-19 infection might comprise of the job status, literacy level, financial status, and living conditions,\(^4\) that have an influence upon the ability for seeking medical care, adherence to the treatment protocols, and practicing the safe physical distance policy. Thus, for effective prediction of the risk factors for community transmission should have inclusion of both clinical and social factors.\(^7\) Many of these factors have not been dealt in detail, especially among people of the lower socio-economic status.\(^7\)

In India, about 80% workforce has a work profile of the informal sector and around 1/3rd of them work as daily wage workers, the lockdown policy might lead to the exacerbation of the already widening health and economic inequalities.\(^6\) Implementation of the personal hygiene and public health behaviors in the form of handwashing and maintaining social distance are necessary for reducing the spread of coronavirus, but it will be difficult to have such practices in many cities and rural areas, especially in the developing countries.\(^9\)

It is very imperative to have in-depth understanding regarding the knowledge, attitude, and preventive practice (KAP) of the public for implementation of the proper measures or development of a targeted approach. Therefore, having these statements in mind, it seems necessary to design and implement research activities in this area.

The results and evidence extracted from such surveys can immediately help and understanding the public health planners and other health sector authorities fight this virus in the most effective way. For the final victory over this disease, the population compliance to the prevention and control measures is important, which is mainly influenced by the knowledge, attitudes, and practices towards this disease. The primary care physicians work at the grass root level to educate and maintain the balance for the prevention of disease. The data of this study can play an important role in creating awareness and emphasizing the hygiene maintenance in order to control the transmission of COVID-19. Our study, aimed to assess the KAP of ESIC patients which are insured patients with the public health sector about COVID-19.

**Sampling technique**

Convenience sampling technique was used to select the study population. Outpatients reporting to the aforementioned hospital during the lockdown period declared by Government of India were included in the study.

**Sample size estimation**

The sample size was estimated with the help of the pilot study. Since the objectives of the study pertain to ease of adapting to COVID preventive practices during the constraints of the Lockdown Period, the sample size recorded till the end of the lockdown period was accepted to be the sample size for this study.

**Sample selection**

The study included all ESIC Insured Beneficiaries attending ESIC Dental College and Hospital above the age of 15 willing to be a part of the study and who gave consent for the study. The study excluded children below 15 years of age.

**Method**

This was a cross-sectional observational study that used a questionnaire developed for the purpose of the survey. The Questionnaire was divided into 5 parts including the Demographic variables, Environmental variables which are enablers for Positive preventive Practices of COVID-19, Knowledge, Attitude and preventive practices for prevention against the COVID-19.

Questionnaire was be developed in English and administered to a representative population via a pilot study for validation. Once validated in English it was translated to local language i.e., Hindi. “Back translation” procedure was used to eliminate errors in translation. The translated questionnaire was administered to a small number of people for validation and Cronbach’s alpha was determined and was found to be good at \(\alpha = 7.36\). Questionnaire was administered in a guided interview format.

**Statistical analysis**

The data thus collected were tabulated using Microsoft Excel and was subject to statistical analysis using Statistical Package for Social Sciences. Both descriptive and analytical Statistics were done.

**Materials and Methods**

This cross-sectional analytical study was done to study the knowledge, attitude and practices of the patients visiting the OPD of the ESIC dental college, Rohini from 1st July to 31st October 2020. The subjects were selected from patients reporting to the outpatient department of ESIC Dental College and Hospital. The institutional permission was obtained from the concerned authorities as the ethical committee clearance could not be taken due to the COVID-19 restriction and an intimation regarding the study was given to the committee.

**Results**

The mean age of the study population was 36.96 ± 13.05 (18–73) years with almost an equal proportion of males and females. Majority of the population had 4-5 members in the family. Majority of the households had elderly aged people more than 60 years [Table 1].

The knowledge about measures to be taken for prevention of corona infection such as Balanced diet, Lockdown, Social distance, frequently wash hands often, using face mask and
regularly cleaning with disinfectant surfaces, Knowledge about signs of corona and maintenance of effective social distancing was significantly better among females. [Table 2]

The correct response to the attitude towards the corona transmission-related prevention as significantly better among females with majority of the subjects displaying good attitude towards the corona disease prevention (94.5%–97.8% correct response rate). [Table 3]

Preventive practices were found to be satisfactory among the study population. Use of soap and handwashing was more than the use of sanitizer. Hand washing, use of mouth mask and taking bath after returning home from outside was significantly better among males. [Table 4]

**Discussion**

Epidemics and pandemics have repetitions in cycle across the time. It is needless to say that they adversely affect people in the community and various non-health-related challenges are also witnessed. The key factor which acts as a roadblock in facing these challenges is lack of awareness which leads to an unconcerned attitude. This attitude mostly prevalent in the underprivileged masses adversely affects preparedness. Fear and anxiety combined with the considerable impact of these epidemics and pandemics might have an adverse effect on the mental status of the population and also influences behavioral pattern of people of that community. [10] So, this study was intended for evaluation of the awareness, anxiety, attitude and perceived barriers towards the prevention of Covid-19.

**Knowledge**

Knowledge about the signs and symptoms of Coronavirus disease was at a high level among people with majority (>80%) providing with right answers regarding the same. These findings were echoed in a study conducted by Kutikuppala et al,[11] wherein 81% of the study participants had good knowledge. It also concurred with study conducted by Olum et al,[12] among Ugandan health-care workers (82.4%) and Rugarabamu et al.[13] on Tanzania residents where 84.4% subjects had good level of knowledge towards COVID-19. However, it was lesser than that reported in a study by Yoseph et al,[14] which had an overall correct rate of 90% for the knowledge questions about COVID-19 in China.[9,15]

| Gender | Frequency | Percent |
|---|---|---|
| Male | 305 | 50.8% |
| Female | 295 | 49.2% |

| What water system in your home? | Frequency | Percent |
|---|---|---|
| 24 h | 168 | 28.0% |
| Comes via tanker or to keep the water | 30 | 5.0% |
| Morning-evening | 349 | 58.2% |
| Comes daily but no definite time | 19 | 3.2% |
| Water does not come everyday | 34 | 5.7% |

| Bathroom | Frequency | Percent |
|---|---|---|
| Inside the house | 549 | 91.5% |
| Public toilet | 51 | 8.5% |

| Is your area had been sealed due to the number of Corona cases? | Frequency | Percent |
|---|---|---|
| No | 424 | 70.7% |
| Yes | 176 | 29.3% |

| No of family members | Frequency | Percent |
|---|---|---|
| 1-3 | 92 | 15.3% |
| 4-5 | 322 | 53.7% |
| 6-10 | 160 | 26.7% |
| 11-15 | 19 | 3.2% |
| > 15 | 7 | 1.2% |

| Number of children under the age of 10 years | Frequency | Percent |
|---|---|---|
| 0 | 308 | 51.3% |
| 1 | 161 | 26.8% |
| 2 | 87 | 14.5% |
| 3 | 29 | 4.8% |
| 4 | 7 | 1.2% |
| 5 | 4 | 0.7% |
| 6 | 2 | 0.3% |
| 9 | 1 | 0.2% |
| 12 | 1 | 0.2% |

| Number of aged people >60 years | Frequency | Percent |
|---|---|---|
| 0 | 349 | 58.2% |
| 1 | 124 | 20.7% |
| 2 | 121 | 20.2% |
| 3 | 4 | 0.7% |
| 4 | 2 | 0.3% |

| Co-morbidities | Frequency | Percent |
|---|---|---|
| Present | 151 | 25.2% |
| Absent | 449 | 74.8% |
Studies conducted in various countries, including the United States,\textsuperscript{[16]} and India,\textsuperscript{[27]} have concurred with this revealing that people are highly aware of Coronavirus, as a lot of information has been spread through the radio messages, television broadcasts, social media platforms and many modes of mass communication. Efforts of official authorities’ efforts like the Ministry of Health and other international bodies such as the WHO have also positively impacted the knowledge of the masses. As per the results obtained, 95% people have agreed that staying at home and following the protocols as being advocated is useful for prevention against being infected. Some studies in this regard have also shown that staying at home and following the social distancing protocol has effectiveness in reducing the transmission of the disease.\textsuperscript{[18]}

Various studies in the literature have reported that countries with no or delayed response in enforcing traffic regulations suffered from a higher prevalence.\textsuperscript{[19]} One of the most effective means to prevent COVID is to practice Social Distancing, making it important for countries to institute relevant measures to ensure this.

Rozenfeld \textit{et al}.\textsuperscript{[17]} identified many of the clinical risk factors related to the serious illness. Older age,\textsuperscript{[19]} diabetes,\textsuperscript{[19]} male gender,\textsuperscript{[20]} chronic kidney disease,\textsuperscript{[21]} raised BMI,\textsuperscript{[22]} and immunosuppression,\textsuperscript{[23]} and other comorbidities have been highlighted by multiple studies as contributors to serious illness. However, some factors previously found to increase mortality risk, such as hypertension,\textsuperscript{[19]} and cardiovascular disease, liver disease, lung disease, or asthma,\textsuperscript{[23]} did not have any significant association with the initial COVID-19 infection.

In spite of higher levels of knowledge reported in various studies, some misconceptions about the disease are bound to prevail. A large proportion (47\%) of subjects believed that the virus is killed by saline rinse, and 58\% subjects believed that the virus wild animals are responsible for transmitting the disease to humans.\textsuperscript{[24]} The drastic increase is incidence rate could occur due to the improper knowledge regarding the disease and prevention against it. Therefore, more detailed comprehensive training and information may need to be disseminated through the media, health practitioners, researchers and other stakeholders.
Table 4: Preventive Practices among study population

| Preventive Practices | Male          | Female         | Total         | P  |
|----------------------|---------------|----------------|---------------|----|
|                      | n  | %    | n  | %    | n  | %    |    |     |
| Method of hand hygiene |    |       |    |       |    |       |    |     |
| Only use Sanitizer   | 11  | 3.6% | 8  | 2.7% | 19 | 3.2% | 0.001* |     |
| Soap - water and use both sanitizer | 155 | 50.8% | 144 | 47.8% | 299 | 49.3% |     |     |
| Wash with soap and water | 161 | 52.8% | 124 | 42.0% | 285 | 47.5% |     |     |
| How many times have your hand washing? |    |       |    |       |    |       |    |     |
| After returning from a public place | 46 | 15.1% | 36 | 12.2% | 82 | 13.7% | 0.001* |     |
| Every 20 min         | 212 | 69.5% | 180 | 61.0% | 392 | 65.3% |     |     |
| Just before cooking or eating | 51 | 16.7% | 44 | 14.9% | 95 | 15.8% |     |     |
| Only when dirty      | 17  | 5.6% | 14 | 4.7% | 31 | 5.2% |     |     |
| Do you use face masks to cover your nose and mouth every time you get out of the house? |    |       |    |       |    |       |    |     |
| Not always possible  | 4   | 1.3% | 5  | 1.7% | 9  | 1.5% | 0.001* |     |
| Sometimes            | 17  | 5.6% | 14 | 4.7% | 31 | 5.2% |     |     |
| Yes, every time      | 295 | 96.7% | 265 | 89.8% | 560 | 93.3% |     |     |
| What do you do with used face masks? |    |       |    |       |    |       |    |     |
| Daily Wash           | 139 | 45.6% | 154 | 52.2% | 293 | 48.8% | 0.001* |     |
| Don’t use more than once | 155 | 50.8% | 113 | 38.3% | 268 | 1.5% |     |     |
| Re-use after 4-5 days | 22  | 7.2% | 17 | 5.8% | 39 | 6.5% |     |     |
| Where do you throw used face masks? |    |       |    |       |    |       |    |     |
| A separate closed trash | 55 | 18.0% | 63 | 21.4% | 118 | 19.7% | 0.001* |     |
| Open to public trash | 5   | 1.6% | 12 | 4.1% | 17 | 2.8% |     |     |
| Burn & throw residues | 1   | 0.3% | 10 | 3.4% | 11 | 1.8% |     |     |
| With household waste | 279 | 91.5% | 175 | 59.3% | 454 | 75.7% |     |     |
| Do you use a phenyl or chemical disinfectant to clean up at home? |    |       |    |       |    |       |    |     |
| No                   | 5   | 1.6% | 45 | 15.3% | 50 | 8.3% | 0.001* |     |
| Sometimes            | 15  | 4.9% | 44 | 14.9% | 59 | 9.8% |     |     |
| Yes                  | 199 | 65.2% | 292 | 99.0% | 491 | 81.8% |     |     |
| Do you take bath every time after coming back home? |    |       |    |       |    |       |    |     |
| No                   | 45  | 14.8% | 62 | 21.0% | 107 | 17.8% | 0.115 |     |
| Yes                  | 249 | 85.2% | 244 | 79.0% | 493 | 82.2% |     |     |
| Are you able to maintain a distance of 3 feet possible in public places? |    |       |    |       |    |       |    |     |
| Sometimes            | 56  | 18.4% | 51 | 17.3% | 107 | 14.0% | 0.001* |     |
| No                   | 13  | 4.3% | 11 | 3.7% | 24 | 4.0% |     |     |
| Yes                  | 209 | 68.5% | 249 | 84.4% | 458 | 76.3% |     |     |

Attitude

It is not necessary that good level of knowledge will reflect positive attitude always. However, positive key findings show that 75% of people stated they would go to a health facility if they had a fever and 90% people said that they have taken preventive measures since the onset of coronavirus such as washing their hands with soap and water and avoiding crowded areas. One of the areas of concern as per the study is the stigma regarding the survivors of the Coronavirus infection.

Gebretsadik et al.[25] reported that the attitude of the study participants seems skewed. Almost half of the respondents (49.2%) believed COVID-19 cannot affect young people. This is mainly due to misinformation in the community. Mainly attributable to high dependence and certainty in scientifically unproven traditional medicine, more than a quarter of participants in this study reported that eating garlic and exposing oneself to the sun or to temperatures higher than 25°C helps to prevent infection with the new coronavirus. In this study, the majority (69.5%) believed sticking to MoH measures is helpful to combat COVID-19.

About 10% people surveyed conveyed that a survivor of Coronavirus cannot be welcomed back in their community while almost half (49.50%) stated they would avoid transactions with shopkeepers who had survived Coronavirus, especially those selling food items and perishable goods such as vegetables. This may raise main concerns about stigma attached to patients who have the disease among their community. Therefore, measures should be taken to increase awareness at the community level to reduce stigma.[10,17]

Lee et al.[24] reported that attitudes, especially the efficacy beliefs, have a significant and high impact on the practicing of the preventive behaviors, thus giving the implication that promoting on of the preventive behaviors toward COVID-19 requires promotion of both knowledge and efficacy beliefs among the public. With respect to this, the evidence has been obtained consistently that the efficacy beliefs can be significant predictors for the preventive behaviors.[27,30]

Practices

The study participants reported frequent use of sanitizers, hand wash, and masks in our study which co-incided with the findings by Ray et al.[8] Yoseph et al.[9] stated that Multivariate analyses of predictors revealed that odds of practice towards COVID-19 were 1.57 times higher among participants that are having the positive attitude about COVID-19 when compared to those with negative attitude.

It is a positive indicator for the increased level of concern towards the personal hygienic measures for prevention against the COVID-19 infection. Many efforts for the sensitization and awareness regarding COVID-19 had a positive effect on their
behavior and attitude and was conveyed by majority (>4/5) participants having agreement with – social distancing, avoiding travel, self-quarantine and adequate hygienic measures. However, when asked about the inclusion of recovered COVID-19 patients to the mainstream of society, their fear, apprehension and possibly stigma was reflected. Stigma associated with health conditions is not a new phenomenon and is seen with many diseases, a prime example being people living with Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome. However adequate awareness may minimize the stigma and facilitate acceptance in the general population, as is demonstrated with decades-long campaign against stigma associated with HIV/AIDS.[10]

Our study also established an association and positive relationship between the KAP scores among the study population. The findings reported by Al-Hanawi et al.,[11] Zhong et al.[9] and Erfani et al.[12] are in line with our study reporting a significant positive relationship between knowledge, attitude, and practices of the people.

Future studies should be conducted by including behavioral (attitudinal) factors, cultural factors, socio-economical and work satisfaction-related factors which may have a great impact on those preventive measure.

Conclusion

The response regarding the knowledge and attitude practices were significantly better among males and preventive practices were significantly better among females. Balanced diet and maintaining the social distancing were the measures regarding which the knowledge was apt among study population. The attitude towards the social distancing, washing of the hands, importance of avoid touching hand with eye, nose and mouth and regular use of phenyl or other chemical cleaning products had positive response rate among study population.

Apprehensions among the public regarding acquiring the COVID-19 infection is high. There is a requirement for intensifying the awareness program and addressing of the mental health issues among the people at this time of COVID-19 pandemic. There are few studies to date that evaluated the mental health perspectives of people during the COVID-19 pandemic. It is important to study the psychosocial impacts among general population, people affected with COVID-19, close contacts of COVID-19 and healthcare workers for planning of the effective intervention strategies.

This study highlights the perspectives of the insured population towards the transmission and prevention of disease. This can pave a path towards the effective control of disease in such communities which are a large part of the Indian population.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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