Factors Influencing The Risk Of COVID-19 In Rural and Urban Populations - A Questionnaire Survey

Research Article

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Abstract

Aim: The aim of the study is to analyse the factors influencing the risk of COVID 19 among urban and rural populations. The pandemic of coronavirus has become the talk of the world nowadays. The community which is divided in to urban and rural populations has been largely affected. The rural, having poor hygiene, less immunity, and no preventive and protective measures are considered to be at a higher risk of COVID-19. In comparison, population density and migrants are very important risk factors for the urban population. A number of factors come in to play when determining which community is at a higher risk of getting infected.

Materials and Methods: A survey questionnaire of 15 questions was prepared using an online survey portal and was circulated among two groups namely, urban and rural. The data was collected in the year 2020 in the months of March to May.

Results and Discussion: Descriptive statistics were expressed by means of frequency and percentage. Chi-square test was used to find the association between the variables and p value was calculated. The present studies show the general public has an opinion that urban people will be affected more as they are very densely populated and are not following the self preventive measures during the pandemic of COVID-19. This is despite the urban population having many facilities such as masks, and sanitisers which they are able to afford for their protection against the life threatening virus.

Conclusion: The present study shows that the urban population is suffering more because it has a higher risk of coronavirus due to dense population, lower immunity and disobedience towards social distancing norms. Though the amenities are inadequate in rural are as, the spread of COVID 19 is under control in rural populations.

Keywords: COVID-19; Coronavirus; Pandemic; Urban; Rural.

Introduction

The pandemic of coronavirus is one that has become the talk of the world nowadays. It's rapid and fast spread has shocked everyone. The well-known coronavirus disease that emerged at the end of 2019 began threatening the health and lives of lakhs of people after a few weeks [1]. Health officials and medical professionals are struggling with the containment of the disease and testing and treating affected people [2]. It has spared no community, neither rural or urban populations [3]. Coronavirus is a collection of viruses that causes diseases in mammals and birds. In humans, these viruses cause respiratory tract infection that can range from mild to severe [4]. Mild illnesses can include some cases of common cold while lethal cases include SARS & COVID-19 [5]. Coronavi-

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rus 19 is an infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-COV2) [6]. It was first identified in Wuhan, China and has since spread globally, resulting in a pandemic. Common symptoms include fever, cough, fatigue, shortness of breath and loss of smell and taste [7]. It can also lead to multiple organ failures, septic shocks, and blood clots [8]. The virus mainly spreads between people during close/direct contact via small droplets produced by coughing, sneezing, and talking [9]. Recommended measures to prevent infection include frequent hand washing, maintaining physical distance from others, self quarantine, face covering and sanitising regularly [10, 11]. These preventive measures should be taken seriously as there are no vaccines nor specific treatments for infection [12].

As stated earlier, the virus spread is equal in all communities and is infecting people from around the country alike [13]. However, in comparison between rural and urban populations, many factors come in to play to determine which population has a higher risk of contracting the virus [14]. One major factor that should be considered is population density of both areas. Undoubtedly, urban cities are more densely populated [15]. However, the initiation of lockdown comes into play here. Since more people means higher transmission and vast spread of the disease, it is certain that urban areas are at a higher risk. But, since the lockdown has been forcefully implemented by the government, it nullifies this factor. Another very important factor is awareness [16]. Rural areas are generally less aware of such situations and so, the pandemic and lockdown news was understood very late by them. Because of this, strict following of the lockdown and self quarantine regime started at a delayed time and so transmission and spread of the virus was not in control at that time [17]. In comparison, urban populations are known to not follow lockdown and self quarantine very rigorously.

The aim of this survey is to observe and analyse the hardships of the rural and urban populations during the pandemic of COVID-19. This is done to conclude which of these communities are at a higher risk of getting infected with coronavirus.

Materials and Methods

A cross sectional questionnaire survey was conducted during April 2020 - May 2020.

In order to assess the awareness level, environmental factors (such as media and timely updates) and information appraisal skills, 15 self structured questions were prepared. The questionnaire survey was distributed among two groups of the public, namely, urban and rural. Both groups consisted of an equal number of people, i.e. 50 each. This survey was used as a medium to interpret which community is at a higher risk of contracting the virus. The survey questions were prepared as such, to focus on gathering information regarding proximal active cases and deaths due to COVID-19, availability of healthcare facilities, adequate income and practicing of self preventive measures. The online questionnaire was developed and circulated with the help of social media platforms. Statistical analysis was done using the SPSS software version 20.0. Descriptive statistics were expressed by means of frequency and percentage. Chi-square test was used to find the association between the variables and p value was calculated.

Results

The COVID-19 pandemic has had a major impact on human life, be it the rural or urban [18]. To conduct the survey, a total of hundred people were chosen equally from both communities. The people were chosen at random, from the general population. The people belonged to the state of Tamil Nadu, India.

Figure 1 shows that 50% of the people who answered the survey questions are from urban backgrounds, where as 50% are from rural backgrounds. Figure 2 shows that 75% of the respondents reported that they have been getting recent updates on the pandemic, out of which 40% are urban and 35% are rural, 25% reported the opposite (where 10% belong to urban community and 15% belong to rural community). Figure 3 shows that 54% of the respondents, out of which, 31% are urban and 23% are rural, feel that they have adequate income in comparison to 25% respondents who responded with 'no'. Figure 4 shows that 65% of the respondents reported that they have active cases of coronavirus in their locality, where 40% are urban and 25% are rural, whereas 35% reported the opposite, in which 10% are urban and 25% are rural. Figure 5 shows that 54% of the respondents reported that they are aware of deaths due to coronavirus in their locality, where 30% are urban and 24% are rural, where as 25% reported the opposite and the remaining 21% are not sure. Figure 6 Shows that 68% of the respondents reported that they have sufficient medical services near them, which consists of 44% urban population and 24% rural population, where as 32% reported the opposite. Figure 7 shows that 75% of the respondents reported that they have been practicing self preventive methods, in which 35% are urban and 45% are rural, where as 25% reported the op-

Figure 1. Bar graph representing association between community background and awareness about pandemic of COVID-19. X axis represents the community background and the Y axis represents the number of responses. Urban population has higher awareness regarding COVID-19 pandemic than the rural population. However, there is no statistical difference between the community background and awareness on COVID 19 pandemic. Chi square analysis was done, Pearson Chi SquareValue=0.709, the P value was 0.400 (p>0.05), not found to be statistically significant.

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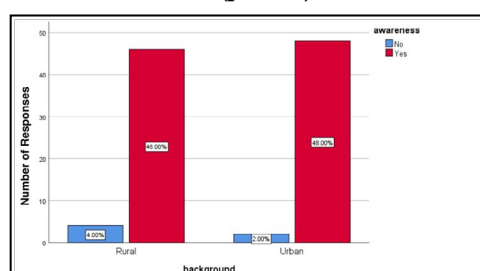
Figure 2. Bar graph representing association between community background and responses about receiving adequate information and updates on COVID-19. X axis represents the community background and Y axis represents the number of responses. Urban population received more updates and information regarding coronavirus than the rural population. However, there is no statistical difference between community background and responses about receiving adequate information and updates on COVID-19. Chi square analysis was done, Pearson Chi SquareValue= 1.333, the P value was 0.248 (p>0.05), and was not found to be statistically significant.
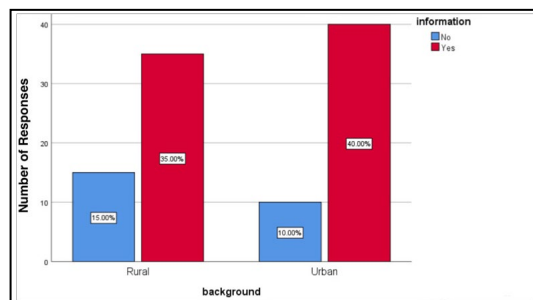

Figure 3. Bar graph representing the association between community background and responses about having adequate income. X axis represents the community background and Y axis represents number of responses. Adequate income was found more among the urban population than the rural populations. Chi square analysis was done, Pearson Chi SquareValue= 9.136, the P value was 0.010, (p<0.05)which was found to be statistically significant. There is a significant increase seen in the urban population who have adequate income during COVID 19 pandemic.
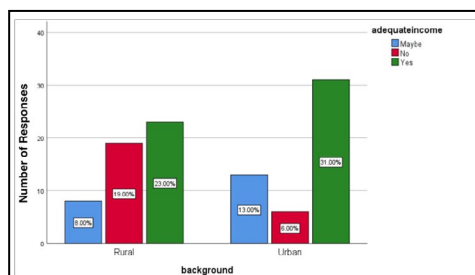

Figure 4. Bar graph representing association between community background and percentage of active cases of COVID-19. X axis represents the community background and Y axis represents the number of responses. Most of the urban population (40%) has reported to have active cases of coronavirus in their locality, compared to 25% of rural population. Chi square analysis was done, Pearson Chi SquareValue= 9.890, the P value was 0.002(p<0.05), which was found to be statistically significant. This is a significant increase in the active cases seen in urban are as when compared to rural areas.
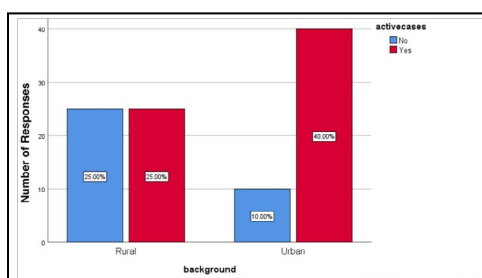
posite. Figure 8 Shows that 20% of the respondents from urban backgrounds think that they are at a higher risk of contracting the virus, where as 16% of the rural respondents think the same. Out of these, the results assessed for their p value and checked for their significance. Figures 3, 4, 6 and 7 were found to be statistically significant, whereas the rest were statistically insignificant.

Discussion

Highly contagious with the possibility of causing severe respiratory infections, coronavirus has quickly impacted public health systems and governments, which have responded by declaring it as a public health emergency of national concern and by adopting measures such as a nationwide lockdown to limit the outbreak [19]. Millions of lives have been altered, a stress coping mecha-

nism is demanded [20]. The outbreak has undoubtedly largely affected the mental, social, financial and physical health of people. Coronavirus has brought the entire nation to a halt [21].

Figure 1 shows that 50% of the people who answered the survey questions are from urban areas and the remaining are from rural backgrounds. Studies show that since most rural populations are illiterate, and do not have the resources, they come to understand and know things very late, or in a delayed fashion [22, 23]. Figure 2 shows that most of the respondents reported that they have been getting recent updates on the pandemic, and only 25% reported the opposite. Majority of the ones who aren't receiving much information comprise the rural population.

One key factor, which should be taken into consideration is the population density [24]. Urban populations have a much higher

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Figure 5. Bar graph representing association between community background and percentage of deaths due to COVID-19. X axis represents the community background and Y axis represents the number of responses. More numbers of deaths due to coronavirus in their locality was reported by the Urban population when compared to the rural population. Chi square analysis was done, Pearson Chi SquareValue= 1.897, the P value was 0.387(p>0.05), was not found to be statistically significant.
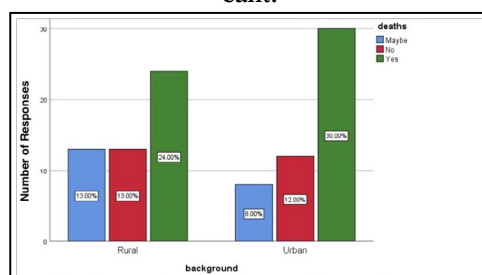

Figure 6. Bar graph representing association between community background and responses towards adequate healthcare services. X axis represents the community background and Y axis represents the number of responses towards adequate healthcare services. Most of the urban population have responded to having adequate healthcare services in their locality. Chi square analysis was done , Pearson Chi SquareValue= 18.382, the P value was 0.000 (p<0.05), which was found to be statistically significant. There is a significantly increased adequacy of health services in the urban areas when compared to rural are as.
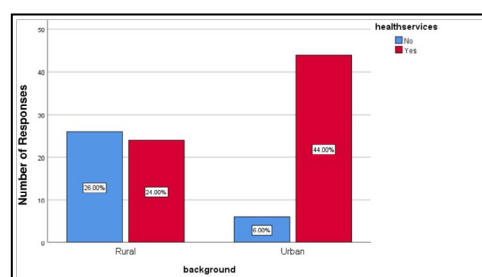

Figure 7. Bar graph representing association between community background and practice of social distancing measures. X axis represents the community background and the Y axis represents the number of responses. Higher numbers of the rural population have reported to be practicing social distancing measures for self prevention. Chi square analysis was done, Pearson Chi SquareValue= 12.000, the P value was 0.001(p<0.05), which was found to be statistically significant. There is a significant increase seen in obedience towards preventive measures in rural population when compared to urban population.
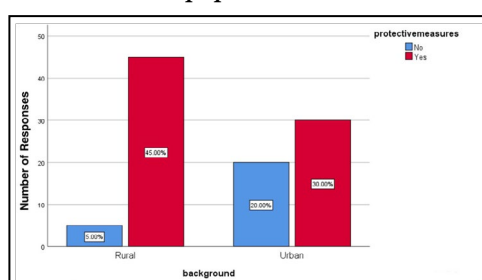

density when compared to rural areas. This plays an important role in determining the spread of coronavirus [25]. In most researches, high density populations may be sustainable in terms of economy during a lockdown or pandemic, however, they become merely defenceless in times of unprecedented disease outbreaks [26]. This is mainly accounted for by the large densely populated areas in the urban cities. A pandemic has many risks towards the millions who live in densely populated megacities [27]. Majorly, the density of the population of these cities provides an ideal environment for infections to erupt, transmit and cause havoc [28].

Figure 3 shows that urban populations are more financially stable in comparison to rural populations. This allows the urban people to buy PPE, masks, sanitisers and other equipment that can help in self protection [29, 30]. However the income of rural people

is not enough or sufficient to buy such equipment. Their low salary and minimal savings, makes it very difficult for them to stock up on these preventive measures [31]. Since most people from urban backgrounds have jobs and have savings they are fortunate enough to store food for hardships like these [32]. On the other hand, studies have shown that since rural people have low salaries, most of it is consumed on rent, housing and minimal daily food [33]. They have very low income which they use for daily survival and daily bread and butter. That income cannot be used to buy preventive and self protective measures such as masks, gloves and PPE [34]. They do not have the luxury of buying sanitisers and using it every six hours to clean their hands [35].

Figure 4 shows that more urban areas have reported with positive cases of coronavirus. One reason for this is the population den-

Figure 8. Bar graph representing association between community background and responses about whether they think their community is at higher risk of contracting COVID-19. X axis represents the background and Y axis represents the number of the responses. More people from urban backgrounds feel that they are more prone to contracting coronavirus in comparison to rural populations. However, there is no statistical difference between the responses. Chi square analysis was done, Pearson Chi SquareValue=2.778, the P value was 0.249(p>0.05), which was not found to be statistically significant.
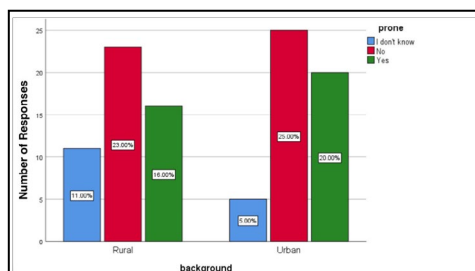
sity factor [36]. Figure 5 shows that in correspondence to figure 3, there are more deaths observed in urban areas in comparison to rural areas. High population also accounts for the higher testing that is required in the urban cities. With an increasing number of cases, the medical facilities are running out of testing equipment and so, more and more people are being left untested [37]. Untested persons may turn positive and in such a scenario, will only aggravate and intensify the spread of the viral infection, without preventive measures [38]. Mostly observed in rural areas, there are not enough medical facilities, which can be of assistance during these tough times. Presence of healthcare institutions does not account for its proper functioning and several times, do not have the appropriate medical personnel to handle very complicated or severe cases [39]. Since less funds are put in to rural areas, and also due to scarce population as established before, a pattern of low quality medical facilities has been observed in rural areas. On the other hand, the urban areas constitute plenty of government and private healthcare institutions, which cater to high end and critical cases [40]. This is why, in figure 6, most rural respondents have responded that they do not have adequate healthcare facilities around them, in comparison to majority of urban respondents who said that they have sufficient medical clinics near by.

In the absence of a vaccine, the only reliable methods are strict adherence to social distancing and following of the lockdown and its regulations, to prevent the situation from quickly worsening [41]. Figure 7 shows that the majority of the people from rural backgrounds are practicing self preventive measures in comparison to urban populations. Studies show that most of the urban populations are less likely to be engaged in self preventive measures due to responsibilities of going to work [42, 43]. Measures such as social distancing are taken very lightly by people from urban backgrounds and they tend to have a laid back attitude towards the same [44]. They show lower intention to adopt recommended behaviors, which lead to less engagement in preventive behaviors among urban residents. Studies have shown that because of the slowing economy and upcoming recession, offices are gradually opening, compelling employees to return to work [45]. The notion of social distancing, though seems easy in theory, is quite complicated and impractical to practice in practicality. This is a major reason for the fast rate of spread among the urban population [46]. On the other hand, people from the rural backgrounds have been observed to follow the rules of the lockdown very sincerely, hence controlling the transmission of the virus, as much as they could [47]. To tackle the pandemic, the urban population has to learn to strike a balance between saving lives and economic revival. One possible explanation for rural populations to not practice social distancing, is that the current media coverage about COVID-19 prevention mostly focuses on large urban cities with high population density, which might not fully satisfy the specific needs of rural populations [48]. Thus, rural residents might not be strongly motivated to engage in adopting the appropriate preventive measures.

Figure 8 shows that more urban populations think they are at risk of contracting the coronavirus. However, the difference between the responses of urban and rural people is insignificant. This is because both communities suffer from pre existing illnesses and thus, are at high risk of getting infected, accounted for by low immunity [49]. Studies show that people from rural backgrounds suffer from a higher percentage of diseases because of low hygiene and minimal to no vaccinations [50, 51]. They get diagnosed with diseases such as tuberculosis, oral cancer, etc. The lack of medical or health support in rural areas accounts for this fact [27]. Contaminated food products and water are a major contributing factor to the widespread disease rate in villages [52]. Urban populations on the other hand, are prevalent to diabetes and hypertension [53].

An additional aspect that needs to be mentioned is the presence of migrants in urban areas. They are carriers of infection and transmit the virus via everywhere they travel [54]. Since they do not settle in one place, there is a high possibility that a positive asymptomatic migrant can be spreading his/her infection to hundreds of people on a daily basis. On the other hand, absence of migrants in rural areas makes it a viable aspect to consider for its lower risk of contracting the infection, when seen in comparison to urban population [55].

Limitations

This study is limited due to a small scale and due to lack of awareness of rural people. Further studies and investigations should take place with a larger scale to fully understand the situation. More preventive and precautionary measures should be supplied to the rural areas along with strict quarantine and lock down measures to ensure the control of spread of the virus [56]. Awareness should also be spread among the population so that they can manage during the lockdown [57]. More ration markets should be open, for cheap buying of groceries and essential items for the poor since they do not have enough savings to do so by themselves.

Conclusion

The present study shows that the urban population is suffering more because it has a higher risk of covid 19 due to dense population, lower immunity and noncompliance towards social distancing norms. Though the amenities are inadequate in rural areas, the spread of COVID 19 is under control in rural populations. There is an urgent need to practice social distancing and self isolation/quarantine in order to control the spread of the virus. Both communities need to take maximum precaution, such as using mouth masks, applying sanitisers, maintaining 6 feet of distance between each other, etc to protect themselves and others around them. Awareness has to be created among both populations by the health sectors and governments on various preventive measures in order to flatten the curve.

Acknowledgements

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