Rural community awareness levels, challenges and strategies adopted to combat COVID-19: A cross-sectional E-survey

Níveis de conscientização da comunidade rural, desafios e estratégias adotadas para combater o COVID-19: uma e-survey transversal

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ABSTRACT | INTRODUCTION: COVID-19 has a widespread effect on rural economies all over the world. It has affecting household incomes, and businesses in every sector of rural economies. Lockdown due to COVID-19 outbreak limiting the outdoor and regular physical activity, and further can leads to increased risk of chronic health conditions. Physical activity and yoga play a vital role in breaking the boredom due to COVID-19 lockdown and thereby, improves the quality of life. **OBJECTIVE:** To identifying the level of awareness and challenges faced by the people of rural communities due to the COVID-19 outbreak. **MATERIALS AND METHODS:** A total of 36 participants were recruited by convenient sampling method from five different villages in District, Ambala, Haryana, India. E-survey questionnaires were circulated through WhatsApp messaging mobile-based application. The questionnaire was formed incorporating the three-point Likert scale with three domains, 1) Awareness, 2) Challenges and, 3) Strategies and 12 items. The questionnaire validation was carried out by the experts through Delphi survey method until S-CVI/Ave > 0.8. The central tendency and dispersion of continuous variable age were expressed in mean with a 95% confidence interval (CI). Categorical data were reported in frequencies as a percentage (%) and sample size (n). The levels of significance were set at 0.05 to minimize Type 1 error. **RESULTS:** The content validity index of the questionnaire, S-CVI/Ave = 0.90. By contacting 36 potential participants, a total of 27 survey responses were recorded. Hence, the response rate (RR) was found to be 75%. The mean with 95% CI of age was 30.8 (27.3 to 34.3) years. A total of 94% (n=25) of villagers were aware of COVID-19, 88% (n=24) were facing challenges, and 86% (n=23) of participants are adopting the best strategies which includes, sealing of containment zone, usage of homemade mask made up of clothes, consuming traditional herbal medicine as immunity boosters for prophylaxis and involving in regular physical activity and yoga. **CONCLUSION:** The rural populations were aware of COVID-19 and having adequate knowledge about COVID-19. They were facing challenges due to COVID-19 and prepared with the best strategies/methods to combat COVID-19.

KEYWORDS: COVID-19. Rural populations. Awareness. Public health. Questionnaire.

RESUMO | INTRODUÇÃO: COVID-19 tem um efeito generalizado nas economias rurais em todo o mundo. Tem afetado a renda familiar e os negócios em todos os setores das economias rurais. O lockdown devido ao surto de COVID-19 limita a atividade física regular e ao ar livre, e ainda pode levar a um risco aumentado de condições crônicas de saúde. A atividade física e a ioga desempenham papel vital para quebrar o tédio causado pelo lockdown e, assim, podem melhorar a qualidade de vida. OBJETIVO: Identificar o nível de consciência e desafios enfrentados pelas pessoas de comunidades rurais devido ao surto COVID-19. MATERIAIS E MÉTODOS: Um total de 36 participantes foram recrutados pelo método de amostragem de conveniencia de cinco aldeias diferentes no Distrito, Ambala, Haryana, Índia. Os questionários da pesquisa eletrônica foram distribuídos por meio do aplicativo móvel de mensagens WhatsApp. O questionário foi elaborado incorporando a escala Likert de três pontos com três domínios, 1) Conscientização, 2) Desafios e, 3) Estratégias e 12 itens. A validação do questionário foi realizada pelos juízes por meio do método Delphi survey até S-CVI / Ave > 0,8. A tendência central e a dispersão da variável contínua idade foram expressas em média com intervalo de confiança (IC) de 95%. Os dados categóricos foram relatados em frequências, porcentagem (%) e tamanho da amostra (n). Os níveis de significância foram estabelecidos em 0,05 para minimizar o erro Tipo 1. RESULTADOS: Índice de validade de conteúdo do questionário, S-CVI / Ave = 0,90. Ao entrar em contato com 36 participantes em potencial, um total de 27 respostas da pesquisa foram registradas. Consequentemente, a taxa de resposta (RR) foi encontrada em 75%. A média com IC de 95% de idade foi de 30,8 (27,3; 34,3) anos. Um total de 94% (n = 25) dos moradores estavam cientes do COVID-19, 88% (n = 24) estavam enfrentando desafios e 86% (n = 23) dos participantes estavam adotando as melhores estratégias que incluem, de zona de contenção, uso de máscara artesanal composta de roupas, consumo de fitoterápicos tradicionais como potenciadores de imunidade para profilaxia e envolvimento em atividade física regular e ioga . CONCLUSÃO: As populações rurais que está ciente de COVID-19 e ter conhecimento adequado sobre COVID-19. Eles estavam enfrentando desafios devido ao COVID-19 e preparados com as melhores estratégias / métodos de combate ao COVID-19.

PALAVRAS-CHAVE: COVID-19. Populações rurais. Conscientização. Saúdes pública. Questionário.

Introduction

Pandemics can occur uncertainly and cause widespread disease. A novel corona virus disease 2019 (COVID-19) is responsible for substantial mortality across the globe, caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). COVID-19 has a widespread effect on rural economies all over the world. It is affecting household incomes, and businesses in every sector of rural economies, as well as community organizations[1]. The Outbreak of COVID-19 provoked social stigma in people of certain ethnic backgrounds. The stigma associated with COVID-19 is that the disease is new, and many people are not properly aware about COVID-19 due to illiteracy and poverty[2]. It can also prevent people from seeking immediate medical attention, and also can discourage them from adopting healthy preventive measures[2]. Building trust in medical health care services, understanding the disease, provide social support, counter it by sharing facts, and adopting healthy preventive measures to keep themselves safe, and can fight social stigma[2].

Lockdown has been announced to prevent the individuals from exposure to infection, due to continuing spread of COVID-19[3]. Personnel protection, hygiene management at community levels, and early detection and isolation are the only effective measures to control the spread of infection[3]. People should be aware regarding the transmission, symptoms, prevention, and management of COVID-19[4].

After approximately 2 months of lockdown period, Indian government finally introduces Unlock 1.0, 2.0, 3.0 (gyms, religious places) and 4.0 with specific guidelines to prevent the transmission of disease. Standard healthcare recommendations should be followed to limit the spread of infection by aware them regarding regular hand washing, practice respiratory hygiene, avoid close contact with the person showing symptoms of respiratory illness, and also to avoid the contact with infected surfaces, and objects[4,5]. Hence, this online survey aimed in identifying the level of awareness, and challenges faced by the people of rural community due to COVID-19 outbreak. This survey would act as the medium of spreading the awareness regarding prevention and management of COVID-19 in the people of rural community.

Methodology

Ethical statement

The cross-sectional E-survey was be approved (MMDU/IEC/142-E) by the institutional ethics committee of Maharishi Markandeshwar Institute of Medical Sciences and Research, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana. The study was executed strictly in accordance with the principles laid by the Declaration of Helsinki (Revised 2013), Council for International Organizations of Medical Sciences (CIOMS) guidelines and International Ethical Guidelines for Health-related Research Involving Humans (2016). As the study was executed in India, it also abided by the National Guidelines for Biomedical and Health Research Involving Human Participants (2017). The aims and objectives of the cross-sectional E-survey, were added within the E-survey link. Successful return of completed survey was considered as the consent by participant. No separate statement for consent was asked within the survey questionnaire. The study was conducted between May, 2020 to June, 2020 through online mode only.

Participating villages

Villagers representing from five villages around Maharishi Markandeshwar (Deemed to be University) namely, Subri, Mullana, Holi, Sohana and Bhudiya of Ambala district participated in E-survey. Total 36 participants were identified by the convenience sampling method and E-survey questionnaires prepared using Google Forms were circulated through WhatsApp messaging mobile based application.

First draft

In first draft of questionnaire, twenty-one (21) questions were included based on the extensive literature survey and analysing present situations. Questions were based on three domains, awareness, challenges and strategies to combat with COVID-19 in rural areas. All questions are graded with short answers type or dichotomous (Yes/No) options. After development of first draft questionnaire were validated by panel of experts for content, sequence and formation. Based on panel's advices, questionnaire has been revised with language editing and modifying some of the questions sequence.

Second draft

Second draft of questionnaire included sixteen questions graded with short answer or dichotomous (Yes/No) options. After reviewing the second draft experts, suggested modifications in overall questionnaire such as, adding three-point Likert scale (Agree/disagree/Neutral) options, frame into three different domains with 4 item in each domains, descriptions of the questionnaire and consent information to be added.

Final draft

Based on the experts' suggestions, final draft of questionnaire was formed incorporating the three point Likert scale, domains and items. Final draft has three domains, 1) Awareness, 2) Challenges and, 3) Strategies. Total 12 items with 4 items in each domain were added in final draft.

Bilingual language questionnaire

After validation and framing of final draft in English language, content were translated in Hindi and verified by native Hindi speaker who have 3-4 years of schooling. Language translation of the questionnaire involved the following standard steps, (i) translation; (ii) preliminary testing of the translated questionnaires; (iii) consolidation of the questionnaire; (iv) back-translation; (v) review of the translations and back-translations; and (vi) development of a synthesized questionnaire.6 Bilingual questionnaire final draft is tabulated in Chart 1. The final validated questionnaire titled "Rural Community Awareness, Challenges and Strategies assessing Questionnaire against Coronavirus Disease 2019 (RACS-Q COVID-19)" by Adarsh Kumar Srivastav, Neha Sharma, Manu Goyal, and Asir John Samuel was copyrighted under the Copyright Office of the Government of India with unique registration no. L-94016/2020 dated 24th August, 2020 (copyright filed with diary no., 9119/2020-CO/L dated 6th July, 2020) as displayed in Figure 1 and circulated through Google Forms, free online survey portal using the link, https://forms.gle/x5xe4R1Hde2n6Yjw5.

Chart 1. Bilingual questionnaire used to evaluate the awareness levels, challenges and measures adopted by village community to combat COVID-19

Hindi	English
1. COVID-19 के बारे में गाँव में जागरूकता का स्तर	**1. Awareness levels in the village regarding COVID-19**
1.1 क्या आप आरोग्य-सेतु ऐप के उपयोग के बारे में जानते हैं?	1.1 Are you aware about the use of Arogya-setu app?
1.2 क्या आप उस आबादी के बारे में जानते हैं, जो COVID -19 संक्रमण के उच्च जोखिम में है?	1.2 Do you know about the population, which is at high risk of COVID-19 infection?
1.3. क्या आप जानते हैं कि COVID-19 संक्रमण पर्यावरण में बूंदों के माध्यम (जैसे छींकने, खांसने) से फैलता है?	1.3 Do you know COVID-19 infection spread through droplets medium (like sneezing, coughing) in the environment?
1.4 क्या आप COVID-19 से निपटने के सुरक्षात्मक उपायों के बारे में जानते हैं?	1.4 Are you aware about the protective measures to combat COVID-19?
2. ग्रामीण COVID-19 द्वारा प्रस्तुत विभिन्न चुनौतियों का सामना कर रहे हैं	**2. Village withstand various challenges posed by COVID-19**
2.1 क्या आपको लगता है कि COVID-19 लॉकडाउन के कारण रोजगार / रोजगार / कृषि गतिविधियाँ प्रभावित हुई हैं?	2.1 Do you think the employment/ jobs/ agricultural activities have been affected due to COVID-19 lockdown?
2.2 क्या आपको लगता है कि COVID-19 लॉकडाउन के कारण शारीरिक गतिविधि कम हो गई है?	2.2 Do you think that physical activity is reduced due to COVID-19 lockdown?
2.3 क्या आपको लगता है कि आप राशन की वस्तुओं के उचित विक्रय मूल्य प्राप्त करने में सक्षम नहीं हैं?	2.3 Do you think that you are not able to get appropriate selling price for ration items?
2.4 क्या परिवहन सेवाओं की अनुपलब्धता के कारण आपको आवाजाही में कठिनाई महसूस हो रही है?	2.4 Do you feel difficulty in movement due to unavailability of transport services?
3. COVID-19 द्वारा उत्पन्न चुनौतियों का मुकाबला करने के लिए गाँव द्वारा अपनाई गई सर्वोत्तम रणनीतियाँ या उपाय	**3. Best strategies or measures adopted by village to combat the challenges posed by COVID-19**
3.1 क्या आपको लगता है कि COVID-19 के प्रसार को रोकने के लिए आपके गाँव में एक रणनीति के रूप में अपनाई गई संक्रमित ज़ोन को भली भांति बंद करना उपयोगी है?	3.1 Do you think sealing of containment zone adopted as a strategy in your village is useful to prevent spread of COVID-19?
3.2 COVID-19 संक्रमण के प्रसार को रोकने के लिए आपके गाँव में व्यक्तिगत सुरक्षा के रूप में कपड़ों के साथ घर पर बनाया मास्क उपयोगी है?	3.2 Adaptation of homemade mask made up with clothes as a personal protection in your village is useful to prevent spread of COVID-19 infection?
3.3 अपने गांव में रोग प्रतिरक्षा बढ़ाने के संबंध में अनुकूलित जागरूकता रणनीति COVID-19 के खिलाफ रोग का निरोध-उपचार के रूप में उपयोगी है?	3.3 Awareness strategy adopted with regard to immunity boosters in your village is useful as prophylaxis against COVID-19?
3.4 एक रणनीति के रूप में आपके गांव द्वारा सुरक्षात्मक उपायों का उपयोग करके शारीरिक गतिविधि / योग का अनुकूलन COVID-19 प्रसार के खिलाफ उपयोगी है?	3.4 Adaptation of physical activity/yoga using protective measures by your village as a strategy is useful against COVID-19 spread?

Figure 1. Copyright certificate (L-94016/2020 dated 24th August, 2020) titled, "Rural Community Awareness, Challenges and Strategies assessing Questionnaire against Coronavirus Disease 2019 (RACS-Q COVID-19)"

Data Analysis

Response rate (RR) of the survey was calculated using the formulae, RR = [(No. of survey participants responded ÷ total no. of potential survey participants contacted) × 100]. The normality of the collected E-survey data were analyzed using Shapiro-Wilk test. As the data does not follow normal distribution, the central tendency and dispersion of continuous variables which included, age was expressed in mean with 95% confidence interval (CI). Categorical data were reported in frequencies as percentage (%) and sample size (n). For all the analyses, the levels of significance were set at 0.05 to minimize Type 1 error. The above statistical analysis was performed using the statistical software, IBM SPSS Statistics for Windows 10, version 20 (IBM Corp., Armonk, N.Y., USA)

Results

This paper aimed to report on awareness, challenges and adapted measures by rural community to combat with COVID-19. An online survey involving recorded 75% (27) of response rate out of the 36 potential participants who participated. The mean with 95% CI of age was 30.8 (27.3 to 34.3) years. The demographic characteristic of participants included in the survey was tabulated in Chart 2. People resides in rural community are well aware (94%) about the mode of transmission of COVID-19 infection. To this effect, respondents who participated in this research was asked regarding awareness of transmission of virus, vulnerable population, uses of protective measures and Arogya-setu application. COVID-19 has had a negative impact (88%) on the daily life of the rural populations. Participants were further asked about the challenges faced in their daily life, as a result of COVID-19. Questions were asked about challenges faced in the agricultural activity, physical health and transportation facility. People (86%) resides in villages are following planned strategies to combat with COVID-19. Respondents were asked regarding the strategies adapted by people such as, sealing of containment zone, using home-made mask for personal protection, boosting immunity and most importantly adding the physical activity and yoga in their daily living as a result of COVID-19. Responses of participants are tabulated in Chart 3. The best strategies adopted by the were sealing of containment zone, usage of homemade mask made up of clothes, consuming traditional herbal medicine as immunity boosters for prophylaxis and involving in regular physical activity and yoga.

Chart 2. Demographic characteristics of participants included in the study

Gender	Male	22 (81%)
	Female	05 (19)%
	Transgender	0 (0%)
Literacy	Less than fifth standard	0 (0%)
	Less than tenth standard	04 (15.4%)
	Pre university courses/Twelth equivalent	10 (38.5%)
	Graduate and above	13 (15.4%)

Chart 3. Survey Responses in percentage (%)

Questions	Responses (n=27)		
	Agree	**Disagree**	**Neutral**
1.1 Are you aware about the use of Arogya-setu app	25 (92.3%)	1 (3.8%)	1 (3.8%)
1.2 Do you know about the population, which is at high risk of COVID-19 infection?	22 (80.8%)	3 (11.5%)	2 (7.7%)
1.3 Do you know COVID-19 infection spread through droplets medium (like sneezing, coughing) in the environment?	27 (100%)	0 (0%)	0 (0%)
1.4 Are you aware about the protective measures to combat COVID-19?	27 (100%)	0 (0%)	0 (0%)
2.1 Do you think the employment/jobs/agricultural activities have been affected due to COVID-19 lockdown?	26 (96.2%)	0 (0%)	1 (3.8%)
2.2 Do you think that physical activity is reduced due to COVID-19 lockdown?	23 (84.6%)	4 (15.4%)	0%
2.3 Do you think that you are not able to get appropriate selling price for ration items?	20 (73.1%)	4 (15.4%)	3 (11.5%)
2.4 Do you feel difficulty in movement due to unavailability of transport services?	26 (96.2%)	0%	1 (3.8%)
3.1 Do you think sealing of containment zone adopted as a strategy in your village is useful to prevent spread of COVID-19?	23 (85.2%)	2 (7.4%)	2 (7.4%)
3.2 Adaptation of homemade mask made up with clothes as a personal protection in your village is useful to prevent spread of COVID-19 infection?	23 (85.2%)	3 (11.5%)	2 (3.8%)
3.3 Awareness strategy adopted with regard to immunity boosters in your village is useful as prophylaxis against COVID-19?	24 (88.5%)	1 (3.8%)	2 (7.7%)
3.4 Adaptation of physical activity/yoga using protective measures by your village as a strategy is useful against COVID-19 spread?	23 (84.6%)	2 (7.7%)	2 (7.7%)

Discussion

Overall knowledge and awareness of COVID-19 among rural community is of paramount importance to control the consequences of the pandemic on health and economic sectors of the country. The previous published literature depicted that 65.5% of the rural community in Bangladesh is imbibed with the knowledge about COVID-19[7]. They are aware about infection itself, its route of transmission, symptoms, incubation period and use of personal protective equipment (PPE)[7].

The overall quality of life, health and financial aspects were affected up to great extent during the lockdown phase in India. The population in the rural areas especially the farmers are greatly affected during the lockdown phase[8]. They were deprived of essential food items and other commodities due to poor physical health as most of the population in the rural community survived on their daily wages. The pandemic had left many workers without jobs and forced them to return to their respective places, despite of lockdown in the entire country to prevent community transmission. Knowingly and unknowingly the migrant workers had put themselves at a greater risk of life to reach their homes and to be with their families.

Due to poor health care systems in rural India, lack of quality care and emergency services made it challenging to tackle public health emergencies. Livelihoods of peoples also affected, as due to lockdown their fruits and vegetables are unable to reach the urban market for sell hence earning gets affected. There is also a shortage of labour to help the farmers with harvesting, loading and transport, as most of them come from other states, and because of the lockdown, they are unable to come. Continuation of lockdown affected the overall food supply chain globally[8].

Rural community have a strong sense of community and resilience. The concept of helping each other or acting in the best interest of the community is often ingrained in rural areas. Several measures has been adopted in response to control the spread of infection, such as, closing of school/colleges, public places, encourage to work from home, restrictions of public transport and prohibition of large number of people gathering at one place[9]. In India, state governments are closely working at the Tehsil levels to ensure that the farmers get the agri-inputs and logistic support to the market. However, each state is working with their own policies depending upon the requirement and number of rural population. In this scenario, E-commerce is helpful in ensuring the adequate support, deliver the goods to the farmers at their doorsteps, sanitized at the warehouse level, thereby reducing the woes and helping in a better yield. Ministry of Micro, Small & Medium Enterprises (MSME) and Small and medium-sized enterprises (SME's) are very helpful during this pandemic era to retain their employees to reduce the job cuts[10].

Physical activity and yoga has been shown positive impact on physical health by boosting immunity, improve the body's ability to fight with infection, improve mental health, and prevent weight gain and overall functioning[11]. Most of the respondents (86% of people) from villages are following these as preventive strategies from COVID-19. During lockdown, physical activity and yoga by using body-weight, exercise equipment or household items are recommended to improve overall well-being. Regular exercise can minimize the physiological effects of an otherwise sedentary lifestyle and increase active life expectancy by limiting the development and progression of chronic disease and disabling conditions. According to American College of Sports Medicine (ACSM) guidelines, exercise prescription for older adults should include aerobic exercise, muscle strengthening exercises, and flexibility exercises[12]. In addition, specific exercises could be added to improve balance and other components of health-related physical fitness[13]. Exercises should be performed with maintaining social distancing and proper hygiene measures. Exercises keep the person active and boosts immune system thus, minimizes the risk of infection[13].

Study has several limitations such as small sample size, and limited time duration of the study. Our survey was only limited to online based, most of the rural populations are having limited access to smart phone and might failed to complete the questionnaire. Community perceptions or views might change over time in response to other services changes. Awareness, challenges and strategies adopted by rural population to fight against COVID-19 has been well established. To the best of our knowledge, our study is the first to explore rural community perception of COVID-19 during the pandemic in India. Further studies can be done with other conditions and longitudinal survey can be done

with larger sample size. Studies can be done to find out the impact of government policies and implementation of awareness programmes on community.

Conclusion

This E-survey study has revealed awareness levels, challenges and strategies planned by village communities to combat against COVID-19. The study concludes that 94% of villagers are aware about the COVID-19 infections, 88% are facing challenges and 86% adopt the best strategies and methods to combat the challenges posed by COVID-19.

Author contributions

Srivastav AK Sharma N participated in literature search, collection of research data, statistical analysis of the research data, interpretation of the data and in the writing of the scientific article. Goyal M participated in the conception, design, and collection of research data. Samuel AJ participated in the conception, design, collection of research data, statistical analysis of the research data, interpretation of the data and writing of the scientific article.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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