

Awareness Of General Public About The Complications Arising After Covid 19 Infection - A Cross Sectional Survey

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ABSTRACT:

Background: Primarily our respiratory system is affected by SARS-CoV-2 virus. Covid 19 in severe cases causes Pneumonia(lung), kidney failure and even death. About 80% of covid infections are mild, 15% severe infections and 5% critical infections. Months after recovery some of them experience complications such as loss of taste (or) smell, heart beat irregularities, shortness of breath, etc.

Aim: To assess the awareness about the complications pertaining to Covid 19 among the general population.

Materials and methods:The cross sectional study was conducted among the general public population between 15-60 years of age. A pre-validated and reliable questionnaire containing 11 questions had been distributed to the participants (Annexure 1). Statistical analysis was performed by using Statistical Package for the Social Sciences (SPSS) software version 23.0 (IBM, Chicago, USA). Descriptive statistics and inferential statistics were performed.

Result: This study was conducted among 100 participants from the general public population. 69.90% of participants accepted that covid 19 causes respiratory and liver failure. 81.55% of them were aware that diabetic patients are at risk of a serious form of covid 19. 45.63% believe that covid 19 infection leads to both loss of short term memory and psychosis, 52.43% have responded that covid

virus damages lungs and 48.54% accepted that agitation, delirium and stroke are all the neurological and mental complications caused due to covid 19 infection.

Conclusion: The overall awareness of the study participants was inadequate. They were well aware of the COVID 19 complications affecting the respiratory system. Whereas they lacked awareness about the fact that along with respiratory systems, covid 19 also causes complications to multiple organ systems of the human body.

KEYWORDS: Covid-19, Post complications, Diabetic complications, multiple organ systems, persistent symptoms, pneumonia, respiratory system,

INTRODUCTION:

During the course of this pandemic 2.4 million Indians recovered from covid 19(1). Primarily our respiratory system is affected by SARS-CoV-2 virus(2). More common viruses causing lethality during recent times are SARS and MERS(3)(4). Covid 19 in severe cases causes Pneumonia(lung), kidney failure and even death(5). About 80% of covid infections are mild, 15% severe infections and 5% critical infections(6). Diabetic patients are easily affected by viral infection and it is risky to treat those patients due to their blood glucose level and also leads to diabetic complications (7,8)(9).

Persistent symptoms will be there even after two months of postcovid infections (10). Months after recovery some of them experience complications such as loss of taste (or) smell, heart beat irregularities, shortness of breath, learning difficulties, etc (7)(11). Several recovered patients have the problem of breathlessness, cardiac, lung and other complications(12). Even mild forms of covid leave persistent symptoms and breathing difficulties in 60 days postinfection (13)(14). Almost 43% recovered patients have worsened quality of life and 87% of them at least have one persistent symptom even after recovery after a 2 month period (15,16). In management of patients multidisciplinary approach was highlighted by chronic multisystem inflammatory syndrome in children (MIS-C)(17)

In advanced stages of covid-19 lungs were severely damaged(18). Surgery or organ transplants are needed(19). Majority of covid-19 deaths have occurred in people who are older in age, fibrosis of even young people who survive the infection can have severe complications (20)(21). Many clinical studies have suggested that patients with covid-19 cause multiple organ and multiple system damage, including circulatory system, nervous system and digestive system(22)(23). An increasing number of COVID-19 patients with liver injury have been reported, but the mechanism by which COVID-19 causes liver injury is not yet clear (24)(25).

Obesity, hypertensive disease and chronic obstructive pulmonary disease are the comorbidities associated with severe COVID-19 cases.(26).

The aim of the study is to assess the awareness related to complications associated with covid 19 among the general population.

MATERIALS AND METHODS:

The cross sectional study was conducted among the general public between the age group 15- 60 of age. Prior ethical approval to conduct the study was obtained from the Institutional Review Board. A Convenience sampling method was employed. Participants of the subject were voluntary, and their identities were kept anonymous. A pre-validated and reliable questionnaire containing 11 questions had been distributed to the participants (Annexure 1). The internal consistency of the questionnaire using Cronbach's α was found to be 0.88. This study assessed the responses to 11 selected questions pertaining to awareness related to complications related to covid 19 through google forms. The google form was sent to those participants through email. Statistical analysis was performed by using Statistical Package for the Social Sciences (SPSS) software version 23.0 (IBM, Chicago, USA). Descriptive statistics and inferential statistics were performed.

RESULTS:

This study was conducted among 100 participants from the general public population. Majority of participants (69.90%) accepted that covid 19 causes respiratory and liver failure . About 9.71% of participants were not aware that covid 19 causes respiratory and liver failure and 18.45% of participants have no knowledge about it (Fig 1) .Most participants (81.55%) are aware that diabetic patients are at risk of serious form of covid 19 and others are not aware of it (Fig 2).

About 22.33% of participants accepted that covid 19 infection leads to loss of short term memory and 30.10% of participants accepted that covid 19 infection leads to psychosis. Most participants (45.63%) are aware that covid 19 infection leads to both loss of short term memory and psychosis (Fig 3). Most participants (52.43%) responded that Covid virus damages lungs. About 5.83% participants responded that Covid virus damages heart and 37.86% participants opined that covid virus damages all the lungs, the heart and the brain (Fig 4).

Most participants (51.46%) are aware that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations, 36.89% of participants reported that

covid 19 infection may attack more than just the respiratory system affecting multiple organs with blood clots and inflammations and 9.71% of participants reported negatively and others are not aware of it (Fig 5). About 17.48% of participants reported that income loss mainly triggered mental health conditions during covid 19 and 28.16% of participants reported that isolation mainly triggered mental health conditions during covid 19. But the majority of participants accepted that both income loss and isolation triggered mental health conditions during covid 19 (Fig 6).

About 14.56% of participants accepted that agitation is caused due to covid 19 infection, 10.68% of participants accepted that delirium is caused and 24.27% of participants accepted that stroke is caused due to covid 19 infection. Majority of participants (48.54%) accepted that agitation, delirium and stroke are all the neurological and mental complications caused due to covid 19 infection (Fig 7). About 38.83% of participants were aware that covid 19 infection triggered cardiometabolic damage and associated complications and the majority of participants were not aware of it (Fig 8).

About 25.24% of females and 27.18% of males reported that both isolation and loss of income triggered mental health conditions during covid 19. Most women reported a high percentage regarding isolation (16.50%) and income loss (6.8%) separately triggered mental health conditions during covid 19. There is no significant difference ($p = 0.4$) between males and females regarding situations that trigger mental health conditions during covid-19 (Fig 9). Compared to males (16.50%), females (22.33%) have more awareness about covid 19 infection triggering cardiometabolic damage and associated complications and majority of participants are not aware of it. There is no significant difference between males and females ($p = 0.4$) about cardiometabolic damage and associated complications triggered by covid 19 infection (Fig 10).

Compared to males (22.33%) mostly females (26.21%) reported that agitation, delirium and stroke are all the neurological and mental complications caused due to covid 19 infection but when comparing separately about delirium (6.8%) and stroke (15.53%) male are reported to be higher and about agitation (9.71%) females are reported to be higher. There is no significant difference ($p = 0.1$) in awareness related to neurological and mental complications between males and females (Fig 11). Compared to males (22.33%) mostly females (22.13%) have more awareness that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations. There is no significant difference ($p = 0.3$) between both males and females, who are not aware of the fact that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations.(Fig 12).

FIGURE 1

Figure 1 Bar graph represents awareness about liver failure. Purple indicates covid 19 causes respiratory and liver failure(69.90%), sandal colour indicates covid 19 do not cause respiratory and liver failure(9.71%), green indicates covid 19 may cause respiratory and liver failure (18.45%) and blue colour indicates the respondents who are not aware(1.94%). Covid 19 causes respiratory and liver failure was accepted by most of the participants.

FIGURE 2

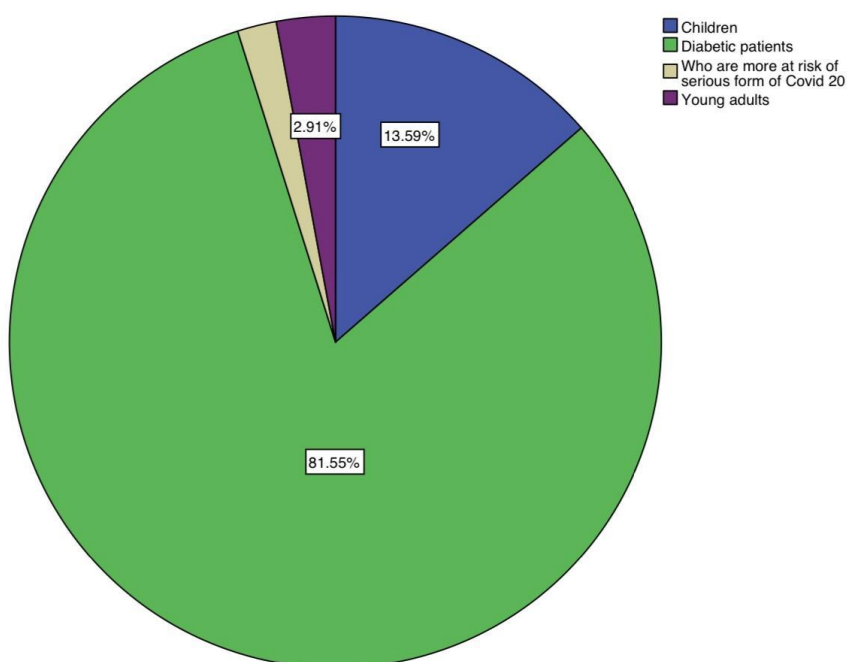


Figure 2 represents population groups who are at risk of serious form of covid 19. Green indicates diabetic patients are at high risk(81.55%), blue indicates children are at high risk(13.59%), purple indicates young adults are at high risk (2.91%) of serious form of covid 19 and sandal colour indicates those who did not answer this question. Most of the participants are aware that diabetic patients are at risk of serious form of covid 19 .

FIGURE 3

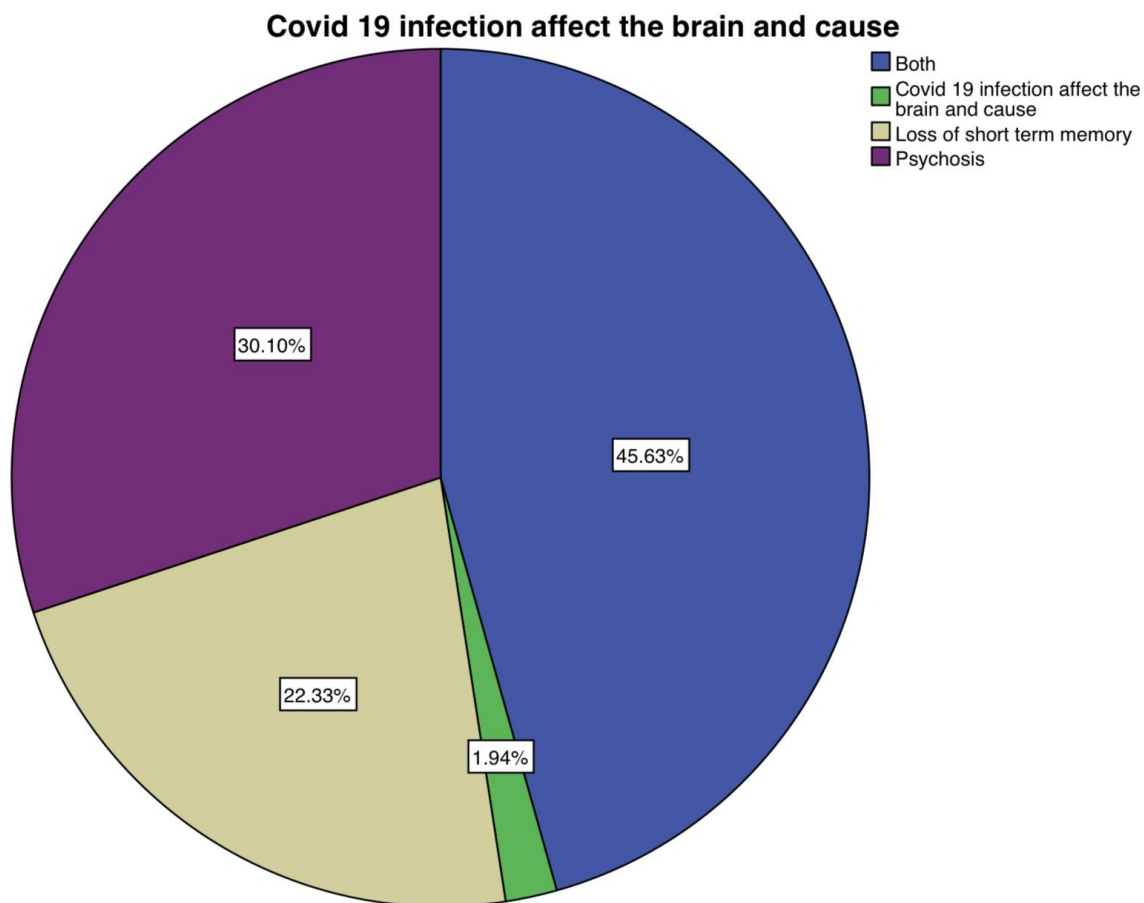


Figure3 represents what will happen if covid 19 infection affects the brain. Blue represents covid infection affects the brain and causes both loss of short term memory and psychosis(45.63%), Purple colour represents covid infection affects brain and causes psychosis(30.10%) and sandal colour represents covid infection affects brain and causes short term memory(22.33%). Majority of participants reported that covid infection affects the brain and causes both loss of short term memory and psychosis.

FIGURE 4

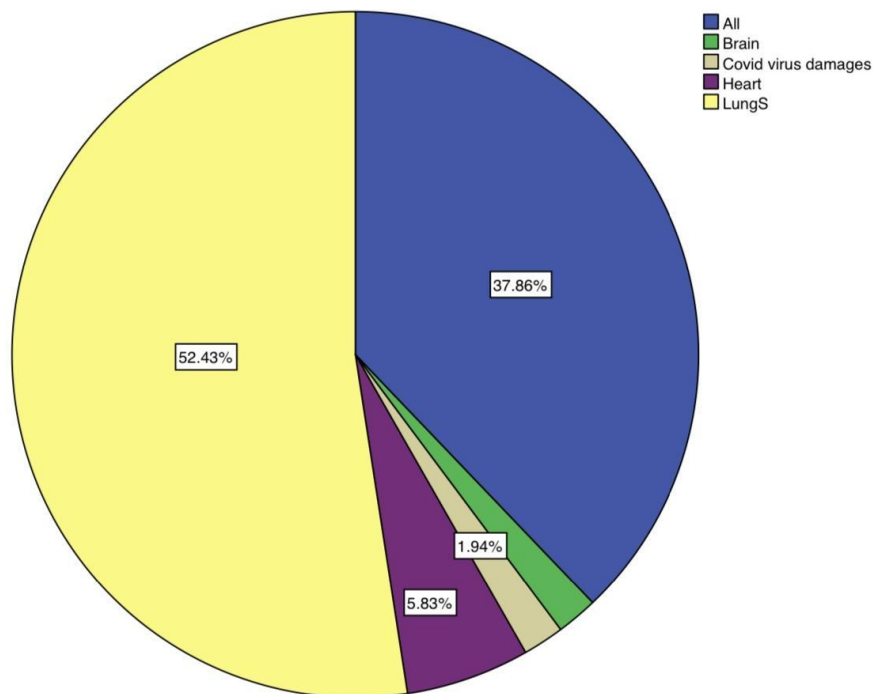


Figure 4 represents awareness regarding whether the brain, heart or lungs are affected by Covid 19. Green colour indicates covid virus damages brain, purple colour indicates covid virus damages heart and yellow colour indicates covid virus damages the lungs (52.43%) and blue colour indicates covid virus damages the brain(37.86%), the heart (5.82%) and the lungs. Majority of participants reported Covid virus mainly damages lungs.

FIGURE 5

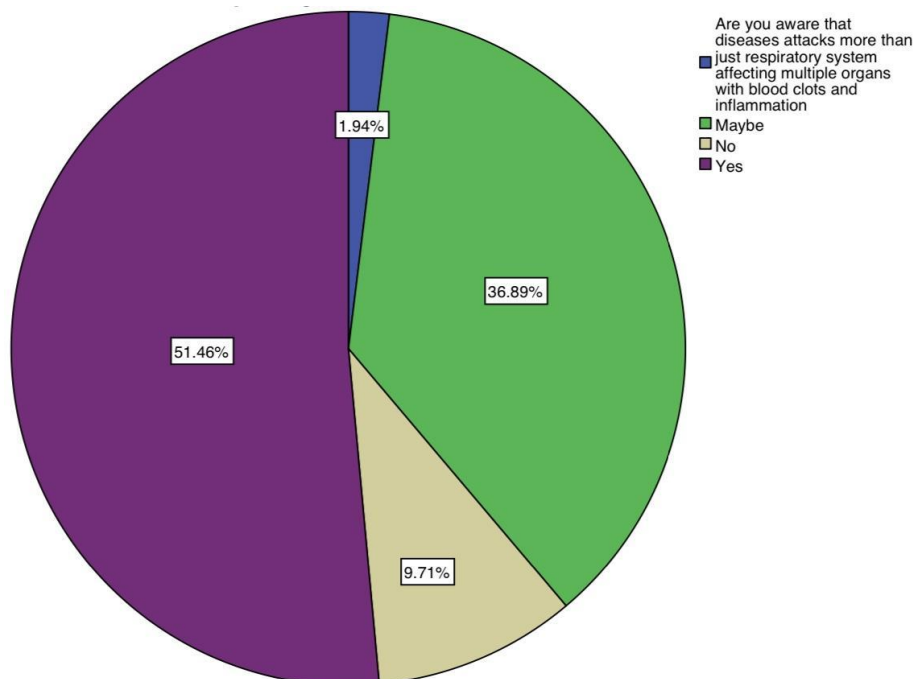


Figure 5 represents awareness of participants whether Covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations or not. Purple colour indicates that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations(51.46%), sandal colour indicates that respondents reported negatively(9.71%) and green colour indicates that covid 19 infection may attack more than just the respiratory system affecting multiple organs with blood clots and inflammations(36.89%). Most participants are aware that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations.

FIGURE 6

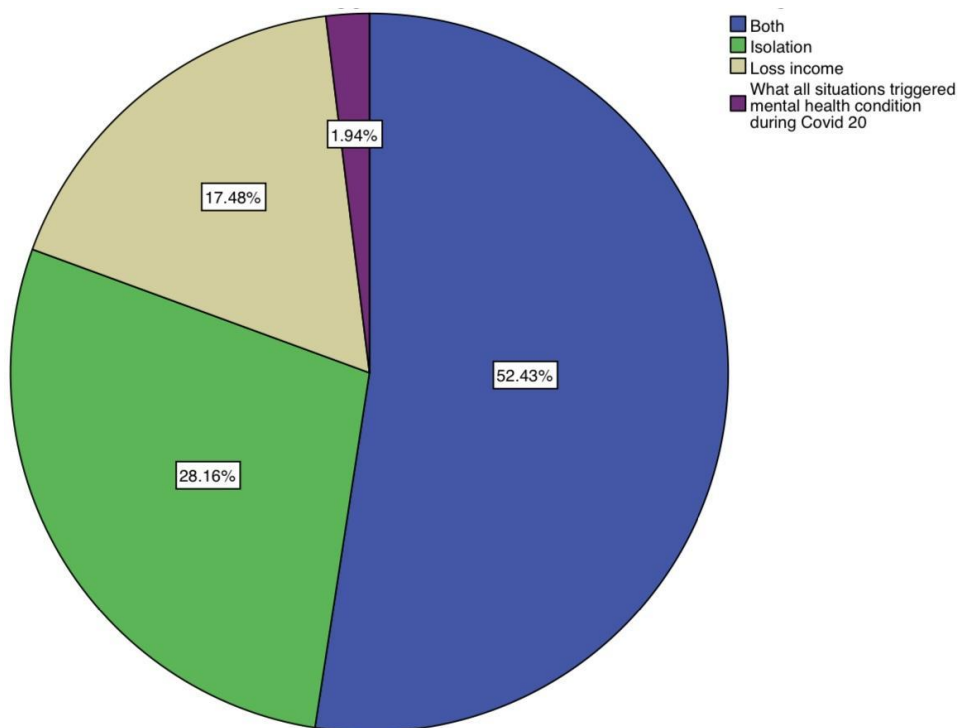


Figure 6 represents what all situations triggered mental health conditions during covid 19. Blue colour indicates that both isolation and income loss triggered mental health conditions(52.43%), green colour indicates that isolation mainly triggered mental health conditions(28.16%), sandal colour indicates that income loss mainly triggered mental health conditions (17.48%) during covid 19 and purple colour indicates who are not answered. Most of the respondents reported both income loss and isolation triggered mental health conditions during covid 19.

FIGURE 7

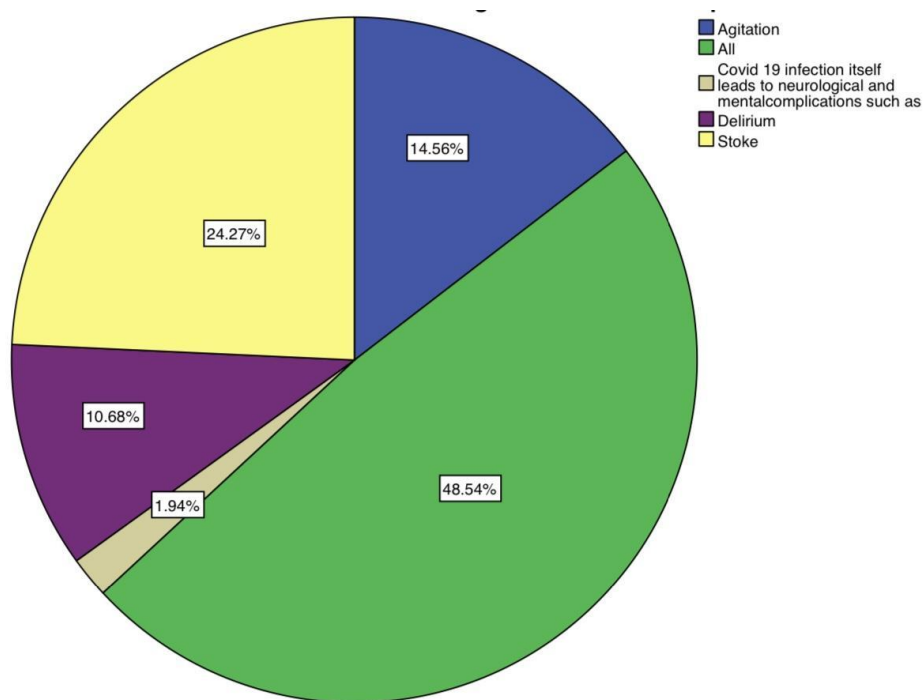


Figure7 represents the neurological and mental complications caused due to covid 19 infection. Green colour indicates that covid 19 leads to neurological and mental complications such as agitation, delirium and stroke (48.54%), blue colour indicates that covid 19 leads to agitation (14.56%), yellow colour indicates that covid 19 leads to stroke (24.27%), purple colour indicates that covid 19 leads to delirium (10.68%) and sandal colour indicates who are not answered. Majority of respondents accepted all the neurological and mental complications like agitation, delirium and stroke are caused due to covid 19 infection.

FIGURE 8

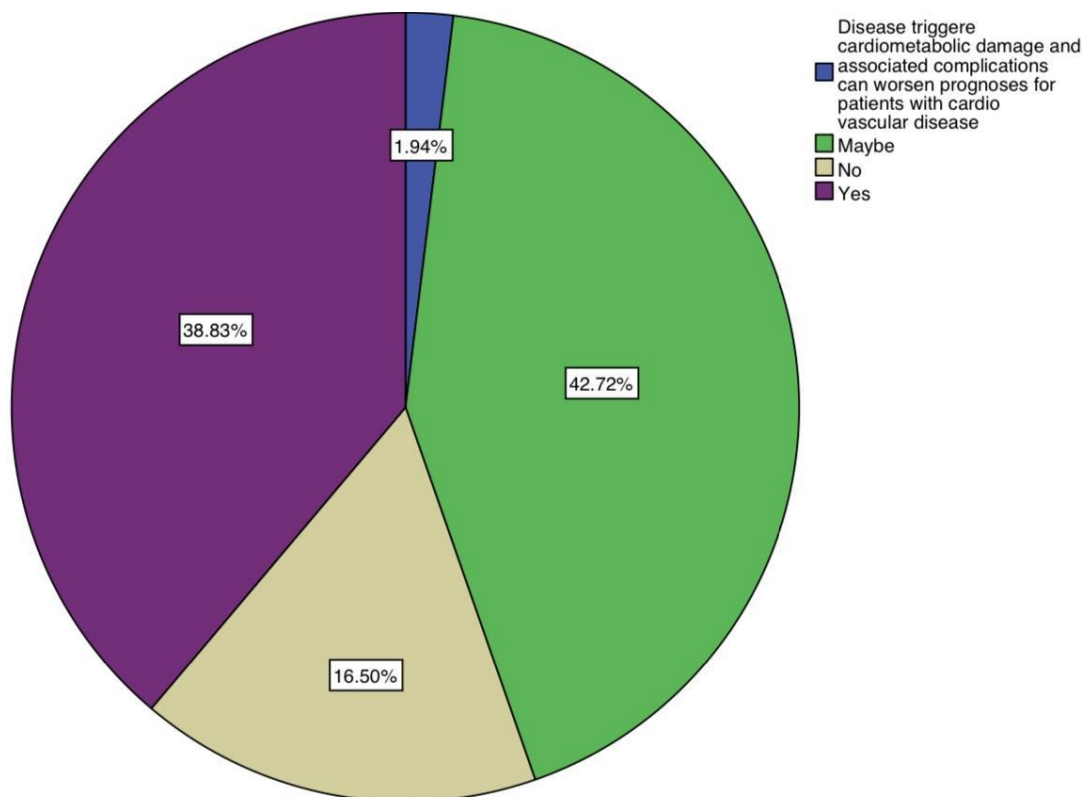


Figure 8 represents whether covid 19 infection triggered cardiometabolic damage and associated complications (which can worsen prognosis for patients with cardiovascular disease) or not. Purple colour indicates covid 19 infection triggered cardiometabolic damage and associated complications (38.83%), sandal colour indicates that covid 19 infection does not trigger cardiometabolic damage and associated complications (16.50%) and green colour indicates 42.72% may triggered cardiometabolic damage and associated complications. Most of the reportants are not aware that covid 19 infection triggered cardiometabolic damage and associated complications.

FIGURE 9

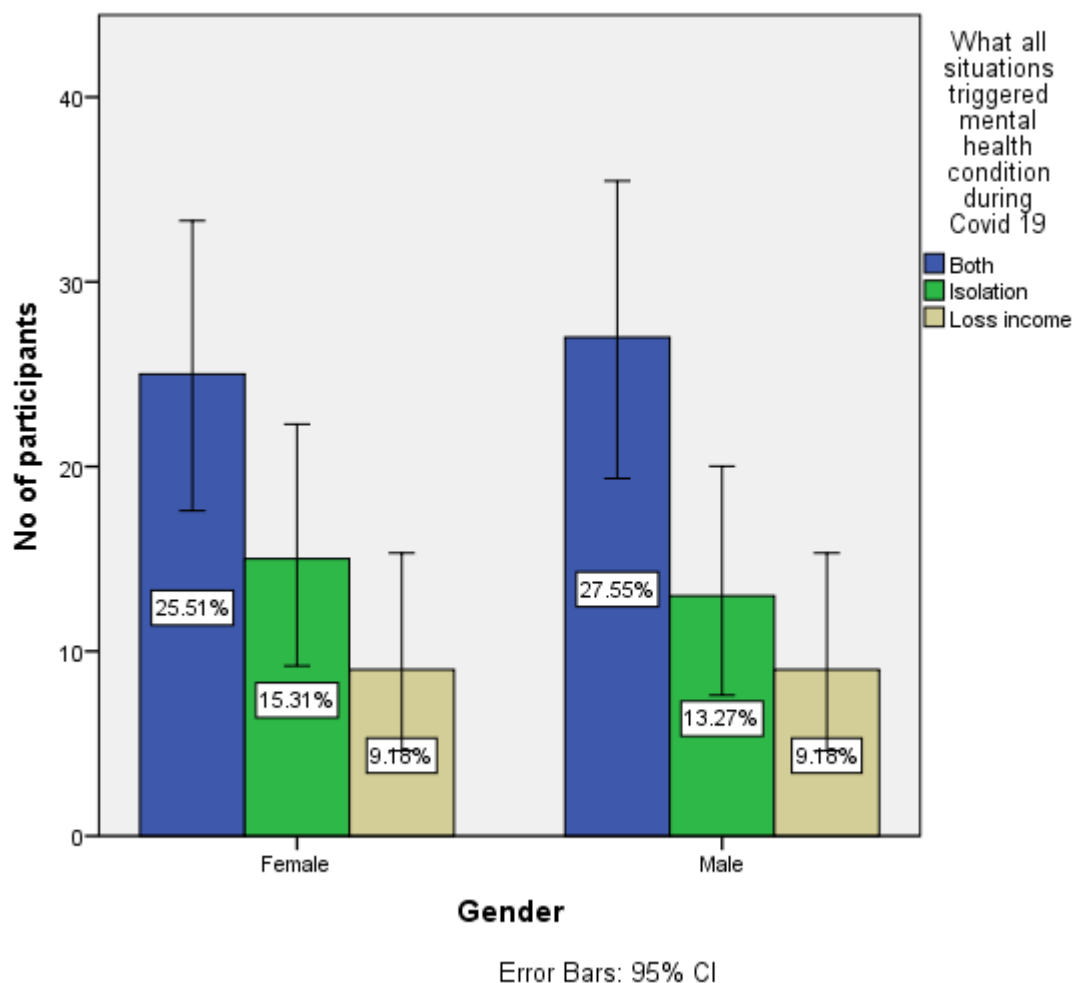


Figure 9 Bar Graph represents awareness about situations which trigger mental health conditions during covid 19 among males and females. 'X' axis represents the gender and the 'Y' axis represents the No of participants. Blue colour indicates that both isolation and income loss triggered mental health conditions in males (27.18%) and females (25.24%); green colour indicates that isolation was the predominant factor which triggered mental health conditions, 11.66% in males and 16.5% in females; sandal colour indicates 10.68% of males and 6.8% of females reported that income loss was the predominant factor triggered mental health conditions during covid 19 and purple colour indicates those who have not responded. ($p = 0.4$) $p > 0.05$ which indicates that though both males and females are well aware regarding the situations that trigger mental health conditions during covid 19 pandemic, it was not significantly different between them.

FIGURE 10

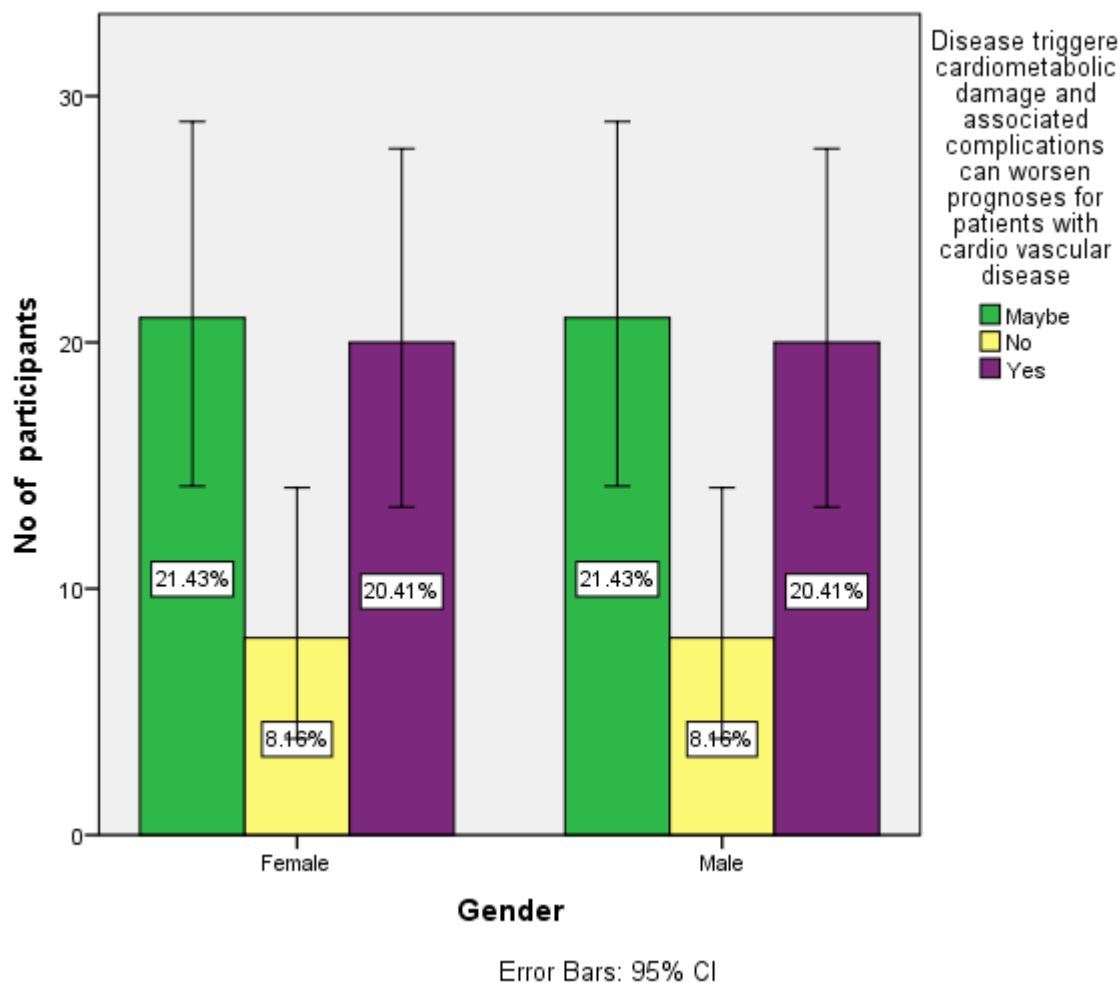


Figure 10 Bar graph represents awareness about covid 19 that triggers cardiometabolic damage and associated complications among males and females. 'X' axis represents the gender and the 'Y' axis represents the No of participants. Purple colour indicates 22.33% of males and 16.50% of females were aware that cardiometabolic damage and associated complications were triggered by covid 19 infection, yellow colour indicates 9.71% of males and 6.8% of females felt that covid 19 infection does not trigger cardiometabolic damage and associated complications and green colour indicates who (23.30% in males and 19.42% in females) were not sure whether the complications will ensue. The differences between the groups was not significant (chi-square, $p = 0.4$) ($p > 0.05$)

FIGURE : 11

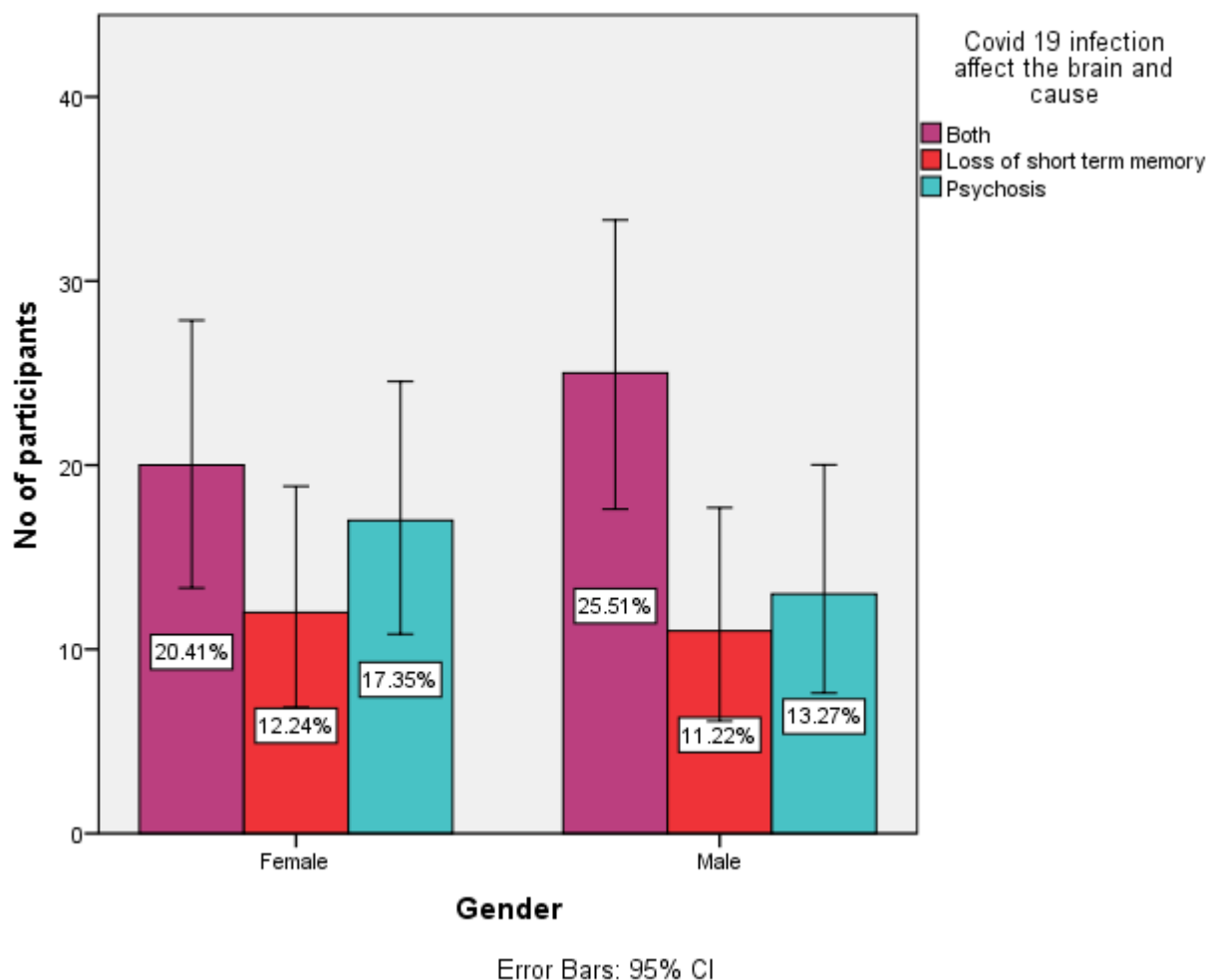


Figure 11 Bar graph represents awareness related to neurological and mental complications caused due to covid 19 infection. 'X' axis represents the gender and the 'Y' axis represents the No of participants. Green colour indicates 22.33% of males and 26.21% of females accepted that covid 19 leads to neurological and mental complications such as agitation, delirium and stroke, blue colour indicates that covid 19 itself leads to agitation (males 4.85% and females 9.71%), yellow colour indicates that covid 19 itself leads to stroke (males 15.53% and females 8.74%), purple colour indicates that covid 19 itself leads to delirium (males 6.8% and females 3.88%) and sandal colour indicates who are not answered. ($p = 0.1$) $p > 0.05$ which indicates that there is no significant difference in awareness related to neurological and mental complications caused due to covid 19 infection between males and females.

FIGURE 12

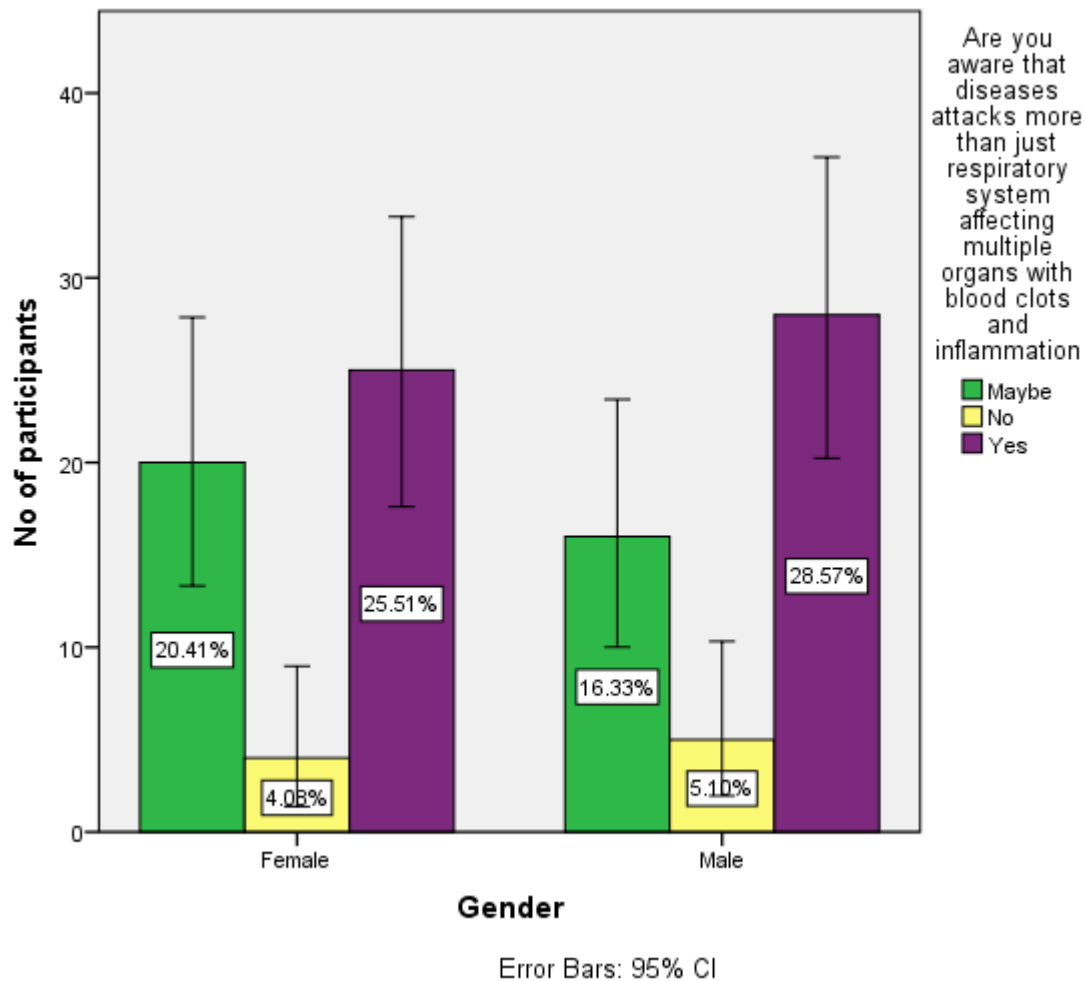


Figure 12 represents awareness of participants whether covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations or not among males and females separately. 'X' axis represents the gender and the 'Y' axis represents the No of participants. Purple colour indicates 22.33% of males and 29.13% of females aware of covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations, sandal colour indicates 5.83% of males and 3.88% of females are not aware and green colour indicates that covid 19 infection may attack more than just the respiratory system affecting multiple organs with blood clots and inflammations (in males 21.36% and females 15.53%). ($p = 0.3$) $p > 0.05$ which indicates that both males and females are well aware of this fact.

DISCUSSION:

In this survey most participants (52.43%) reported that covid virus damages lungs. About 5.83% participants reported that covid virus damages the heart and 37.86% participants reported that covid virus damages all

the lungs, the heart and the brain. In one of the previous study it is reported that most common symptoms are nonspecific, including fever (88%), fatigue (70%), dry cough (67.7%), anorexia (40%), and myalgia (35%) (27)(28)

One of the previous studies regarding covid reported the psychological conditions of doctors who are treating corona patients that is 43% prevalence of anxiety/depression among frontline physicians of Pakistan was reported (29). Our study reported the psychological conditions of participants of the survey about 17.48% of participants reported that income loss mainly triggered mental health conditions during covid 19 and 28.16% of participants reported that isolation mainly triggered mental health conditions during covid 19. But the majority of participants accepted that both income loss and isolation triggered mental health conditions during covid 19.

In one of the articles regarding Neurological complications in COVID- 19, they described a cohort of 43 patients, 23.25% of whom had encephalopathy and 18.6% strokes with a high prevalence of inflammatory CNS syndromes (27.9%). Nine of 12 cases demonstrated acute disseminated encephalomyelitis (29,30). And from this survey we came to know that about 14.56% of participants accepted that agitation is caused due to covid 19 infection, 10.68% of participants accepted that delirium is caused and 24.27% of participants accepted that stroke is caused due to covid 19 infection. Majority of participants (48.54%) accepted that agitation, delirium and stroke are all the neurological and mental complications caused due to covid 19 infection.

One of the previous studies regarding cardiovascular complications covid-19 reported that COVID-19 infection leads to dysfunction of endothelial cells which shutdown the process of fibrinolysis and induces excess thrombin generation. COVID-19 in severe cases causes hypoxia in which thrombosis was stimulated by increasing blood viscosity (31),(32). In present study 51.46% of participants reported that covid 19 infection attacks more than just the respiratory system affecting multiple organs with blood clots and inflammations, 9.71% participants reported negatively and 38.89% of participants reported Covid 19 infection may attack more than just the respiratory system affecting multiple organs with blood clots and inflammations.

One of the previous studies reported that Renal Replacement Therapy (RRT) is required to treat severe Acute Kidney Injury (AKI) which occurs in 5% of total hospitalised patients and 20–31% of critically ill patients and in severe Covid cases require mechanical ventilation. After resolution from active Covid infection some of them

develop accelerated lung fibrosis (33)(34).In our present study 69.90% of participants reported covid 19 causes respiratory and liver failure, 9.71% of participants reported covid 19 do not cause respiratory and liver failure, 18.45% of them reported covid 19 may cause respiratory and liver failure and 1.94% of participants were not aware of it.

CONCLUSION:

From the result of the survey it is concluded that most of them have awareness about the complications that affect respiratory systems regarding covid 19 but lack awareness about complications that affect other organ systems like brain, heart, liver and kidney. Along with respiratory systems covid 19 also causes complications to multiple organ systems of the human body and totally collapses it.

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CONFLICT OF INTEREST:

The authors declare that there was no conflict of interest in the present study.

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7. Website [Internet]. [cited 2021 Mar 12]. Available from: Cardiovascular Complications Associated with COVID-19 and Potential Therapeutic Strategies Arun Samidurai and Anindita Das* Division of Cardiology, Pauley Heart Center, Internal Medicine, Virginia Commonwealth University, Richmond, VA 23298, USA; arun.samidurai@vcuhealth.org *Correspondence: anindita.das@vcuhealth.org; Tel.: +1-804-628-5519; Fax: +1-804-828-8700 Received 2020 Aug 1; Accepted 2020 Sep 11. Copyright © 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and
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