# Medical Science

# Estimation of the psychological impact of covid - 19 diseases on recovered people in Taif city, Saudi Arabia

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## ABSTRACT

*Background:* COVID-19 1st started in China and the World Health Organization has announced this to be a pandemic. Isolation measures are used everywhere to rule out the expansion of the virus, lead to the rapidly growing of assured cases and deaths, both, healthcare providers and general population have been suffering from psychological problems, including stress, depression and anxiety. *Aim:* study aimed to assess the psychological impact of Covid -19 disease on recovered people in Taif city. *Methods:* Cross-sectional study was conducted among people infected with COVID -19 and recovered at Taif city, Kingdom of Saudi Arabia, duration extended from February 2021 to June 2021. A self-developed electronic questionnaire was used with a total of 661 responses received. SPSS was used for data analyzed and Approval of institutional Review Board (IRB) at Taif health authorities was obtained. *Results:* Mild depression level of 17.4% of population and severe anxiety level of 3.2% were unveiled with a statistically significant relation between depression level and nationality, age, marital status, education and employee status $p<0.05$. Depression, on the other hand, was significantly and positively correlated with stress and anxiety ($r=0.651$ and $r=0.683$) respectively. There was significant positive correlation between anxiety, stress and depression levels $p=.0001$. *Conclusion:* COVID-19 pandemic has created to some extended psychological challenges such as, stress, depression, and anxiety, for recovered people in Taif city of Saudi Arabia. There was statistically significant relation between anxiety, depression and stress levels and some characteristics of studied participants. In addition, significant positive correlation between anxiety level and depression was addressed statistically.

**Keywords:** psychological impact, Covid 19, recovered people

## 1. INTRODUCTION

At the beginning of year 2020, from Wuhan city, COVID-19 1st started in China and Organization of World Health has announced this to be a

pandemic. The rapid increase in confirmed cases and deaths has left many people and health care providers suffering from psychological dilemmas, including stress, anxiety and depression, including those who have recovered. During the pandemic of COVID-19, the ministry of health in Saudi Arabia identified specific legislations to lessen the spread of infection. The regulations include quarantine and curfew which is psychologically affecting the general population (WHO, 2007) the new 2019 coronavirus is a new human coronavirus that is widespread in China and other countries with epidemic features; cases have also been registered global. This new coronavirus (COVID-19) is associated with some respiratory manifestations that can lead to acute respiratory dysfunctions (Petrohilos et al., 2020). Common symptoms of COVID-19 include: high temperature, sneezing, cough and shortness of breath. It may cause many complications in patients with immunodeficiency and patients with chronic diseases (Ministry of health/kingdom of Saudi Arabia, 2020). People of all ages are susceptible to the problems effects of social isolation such as depression, anxiety, heart diseases (Chatterjee and Chauhan , 2020).

A comparable with a study conducted to the population in Saudi Arabia in general to locate the degree of psychological impact in the early stage of the covid-19 pandemic upsurge, results reflected that approximately one-fourth of the general population sampled had moderate to extreme psychological impact (Alkhamees et al., 2020). Another research aimed to determine the association between psychological problem and post-traumatic stress (PTSD) of Covid-19 outbreak, of participants 12.8 % were diagnosed with PTSD within 30 days after COVID-19 come up. The expansion of PTSD in women were markedly increased with psychological distress, however, the prevalence of PTSD in male has jump up (Liang, 2020). Health isolation, preventive measures, and social and psychological were considered to have major impact on people with most harmful effect being Stigma; the view on people on lockdown from those who are outside which was out of control. They may also be socially bypassed, separated against in the workplace (Xiang, 2020). One of the previous studies revealed that social quarantine and loneliness have been connected to negative and abnormal physical and mental health problem outcomes, such as jump up of depression disorder and anxiety manifestations.

The virus that causes COVID-19 disseminated world widely as it can be transmitted from an infected person through sneezing or coughing, especially in the overcrowded areas. The infection can be transmitted by contacting hands on a defiled surface and then touching nose, eyes or mouth prior hand washing (Rubin and Wessely, 2020). The spread of COVID-19 in more than 50% of countries with more than million affected cases and thousands of losses has the ability to adversely affect health at the individual and community level, mentally and psychologically (Banerjee, 2020). Stress was linked to studying epidemiology, signs and symptoms, ways of transmission of the virus, the spread of the virus. However, no focus was placed on psychological health, which is of critical matter in this condition. Although research into past epidemics can prove the effects of a pandemic on global mental health, psychological impact has not been measured.

Respiratory viral alterations are associated with dangers and long-term complications in recovered patients (Bohmwald, 2018). It is recorded that corona virus can be found in the brain or cerebrospinal fluid or indirectly through the immune response (Wu, 2020). In their study, (Arabi, 2015) addressed that the Middle East respiratory syndrome coronavirus (MERS-CoV) may involve the central nervous system, stimulate systemic inflammation and victims may present with severe neurologic problems which included changes in the level of consciousness. Further, in relation to some particular research based on the mental health impact of recovered people, it is set that they had manifest of psychiatric problems. (Lam, 2009) conducted a study on Long-term follow-up of Psychiatric patients in SARS-CoV-1 survivors among the 181 individuals who took part in the clinical interviews, (54.5%) diagnosed with PTSD and (39%) diagnosed with depression and (15.6%) with obsessive-compulsive disorder. In addition, there is an association between coronavirus with a history of mood disorders and attempted suicide (Okusaga, 2011). Furthermore, it is believed that emergency situations may lead to neurological problems that affect the cognitive function. In the study by (Sheng, 2015), mental illness manifestations have been noticed in surviving patients of extremely severe acute respiratory syndrome (ESARS) and Middle East respiratory syndrome (MERS). After recovery from infection, recovered patients were classified as having sleep disturbance; emotional distress, low concentration, fatigue, and memory impairment were found in more than 15% of patients, emotional impairment, and unclear speech after a short follow-up.

Psychological intervention is necessary to improve the mental and psychological health of people and psychological adjustment is necessary during the occurrence of this virus or any other virus and epidemics in the future. It is suggested that a mental health professional be part of the medical Team to treat the patients how have been infected with COVID-19 (Grover et al., 2017). Taking into account previous studies and evidence about SARS outbreaks and MERS, suggestion was made that COVID-19 recovered patients will show a significant effect on psychological status such as mood problems, anxiety, PTSD, and insomnia. Obtainable data indicated that confusion and delirium are mutual symptoms in the acute phase (Rogers et al., 2020). A previous study addressed evidence of emerging acute neuropsychiatric symptoms. In Wuhan city, China, a study was conducted on 214 hospitalized patients, with confirmed diagnosis of severe acute respiratory syndrome from coronavirus (SARS-CoV-2) infection, 40

out of 88 of patients were likely to have neurologic problems, including cerebrovascular complications, encephalopathy, and muscle injuries (Mao et al., 2020).

Another study carried out in Wuhan city, China to determine the associated risk factors in discharged patients suffered from COVID-19 with mental illness, 90 (13.3%) patients were medical staff and nearly (12.4%) has been diagnosed with symptoms of PTSD due to COVID-19. A further (10.4%) were classified as having moderate to severe symptoms of anxiety while (32.3%) of patients recorded with mild symptoms. Also, (19%) were classified as having moderate to severe depression symptoms, (46.7%) relay mild symptoms, (6.07%) had severe anxiety and clinically significant PTSD, (8.44%) had clinically significant PTSD and depression, another (8.44%) had depression and anxiety symptoms, and lastly, (5.48%) of the patients were classified with all three (Liu et al., 2020).

Accordingly, the authors hope that this unique contribution will contribute to determining the psychological impact of Coronavirus on recovering patients in the city of Taif, and the types of psychological problems that the recovering patients suffered from, which may help in implementing the necessary procedures to provide treatment to Covid-19 patients who suffer from various psychological problems, especially those patients with pre-existing risk factors and chronic diseases and the importance of including innovative coping strategies when providing psychological interventions. This research aimed to estimate the psychological impact of Covid -19 on recovered people in Taif city.

## 2. METHODS

### Research design

It's a descriptive cross-sectional study. *Setting:* Kingdom of Saudi Arabia, Makkah district, Taif city. *Population*: The study populations included were people who had been infected with COVID-19 in Taif city and recovered. *Duration:* extended from February 2021 to June 2021. *Sampling:* The inclusion criteria for people who will participate in the study include patients infected with COVID -19 and recovered who are registered in the Taif city health authorities, and agreed to participate in this study. While the exclusion criteria will include recovered patients refuses to participate in the study, recovered patients with no special and different characteristics from those included, however, and refuses to participate in the study. *Sample size* was 661.

### Data collection tool

A self-developed electronic questionnaire in written in English and translated to Arabic language, using word-for-word translation method, prepared to collect data for this study it was adopted from relevant literature and previous similar studies. The questionnaire consisted of two parts: Part one: Aimed to gather information about study participants' background that included (nationality, Gender, Age, Marital status, Educational level, Employee status, availability Previous mental & psychiatric disorders, coronavirus test result, severity of symptoms, place of quarantine, received a psychiatric diagnosis and medications received during quarantine. Part two**:** modified (DASS) was used to estimate the Depression, Anxiety and Stress, the scale modified by authors for suitable with the new research environment, by modifying in some words, which is the residents of Taif city without any validity effect. Accordingly, the interpretation of the (DASS) questionnaire followed this sequence; questions from 1 to 8 for depression subscale. The total depression subscale score was split into normal (0–9), mild (10–12), moderate (13–20), severe (21–27), and highly severe (28+). Questions from 9 to 16 for anxiety subscale. The total anxiety subscale score was split into normal (0–6), mild (7–9), moderate (10–14), severe (15–19), and highly severe (21+). Questions from 17-23 is for stress subscale. The total stress subscale score was split into normal (0–10), mild (11–18), moderate (19–26), severe (27–34), and highly severe (34+). To insure confidentiality, authors will not be discussing information provided by participants with others, and findings will be presented in a manner that ensure participants cannot be specified (chiefly through anonymization). Contact information of the researcher was provided for participants to use when needed. Recommendations will be raised for the health authorities in Taif City for further investigation and treatment.

### Data collection technique

Data collected electronically by online distribution of the questionnaire. Individuals of the research sample were invited to participate using social media like WhatsApp, where a message for acceptance or rejection will be send to participants to answer the questionnaire, all respondents were providing Informed consent. Collected questionnaires are then available in the computer memory for its statistical analysis.

**Data analysis**

The data analyzed using the statistical packages for the social sciences program (SPSS). Descriptive statistics (frequencies and percentage,) relied on determining the demographic data of the study population and determination types of psychological problems among recovered patients at Taif city. While T-test and mono-analysis of variance (ANOVA) will be relied to verify the presence of statistically significant differences of psychological problems among recovered patients at Taif city due to the following variables: (gender, age, social status and educational level). Best fitting multiple linear regression models for the depression, anxiety and stress was made.

## 3. RESULTS

A total of 661 responses were received that satisfied our eligibility criteria that were included in the study. Table 1 shows that almost of nationality was Saudi participants 95.3%, studied participants 54.5% of them were females, 33.5% of them had age from 21 to 30years, majority were single (62.3%) More than one half of them (59.6%) were university education, slightly less than one half 45.7%of studied of them students, in addition 91.8% of them no previous diagnosis with any mental illness. Merely 8.9% of them are medium severity of COVID -19 symptoms**.** Only 3.8% of them isolation period applied during Covid-19 in hospital, that almost of studied participants 90.6% was no mental or psychological diagnosis during the isolation period. Finally, 91.7% of them not take mental health medications during the isolation period regarding the distribution of depression, anxiety, and stress among participants. Figure 1 shows, mild depression of (115) 17.4% and a mild anxiety of (73) 11.0%. In addition, (18) 2.7% were mild stress level

**Table 1** Socio-demographic characteristics of participants in the study sample (*n* = 661).

| Parameters | n=661 | |
|---|---|---|
| | No. | % |
| Nationality | | |
| Saudi | 630 | 95.3% |
| Non Saudi | 31 | 4.7% |
| Sex | | |
| Males | 301 | 45.5% |
| Females | 360 | 54.5% |
| Age per years | | |
| Less than 20 | 122 | 18.5% |
| 21- 30 | 221 | 33.5% |
| 31-40 | 84 | 12.7% |
| Greater than 40 | 83 | 12.6% |
| marital status | | |
| Married | 228 | 34.5% |
| Single | 412 | 62.3% |
| Divorced | 16 | 2.4% |
| Widower | 5 | 0.8% |
| Educational level | | |
| Less secondary | 30 | 4.5% |
| Secondary | 204 | 30.9% |
| University | 394 | 59.6% |
| Above university | 33 | 5.0% |
| Employee status | | |
| Employee | 192 | 29.0% |
| Not employee | 167 | 25.3% |
| Student | 302 | 45.7% |

| | | |
|---|---|---|
| Previous Diagnosis with any mental illness | | |
| Yes | 54 | 8.2% |
| No | 607 | 91.8% |
| Severity of Covid -19 symptoms | | |
| Light | 340 | 51.4% |
| Medium | 262 | 39.6% |
| Severe | 59 | 8.9% |
| Isolation period applied during Covid-19 | | |
| Hospital | 25 | 3.8% |
| Home | 570 | 86.2% |
| Other | 66 | 10.0% |
| Mental or psychological diagnosis during the isolation period | | |
| Yes | 62 | 4.9% |
| No | 599 | 90.6% |
| Take mental health medications during the isolation period | | |
| Yes | 55 | 8.3% |
| No | 606 | 91.7% |
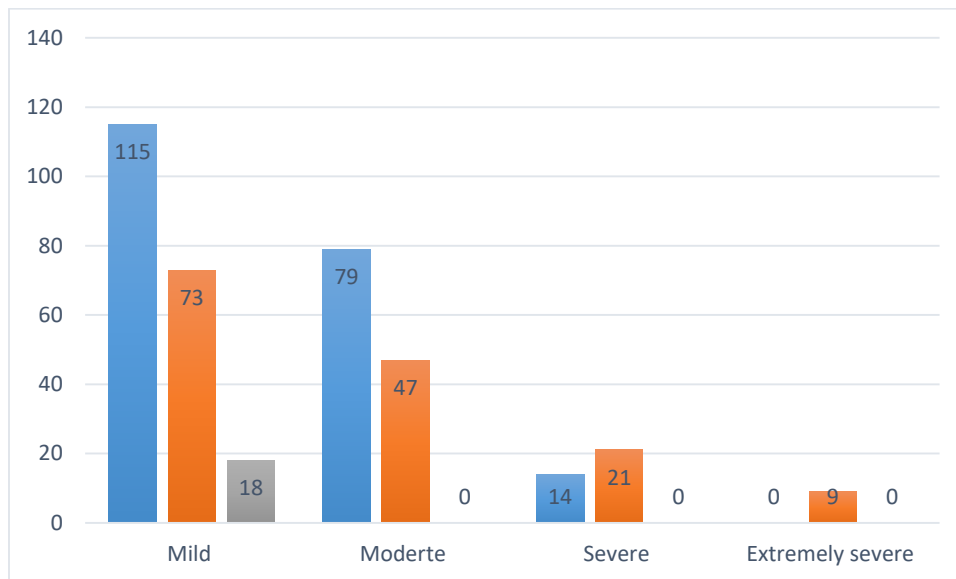


**Figure 1** Distribution of depression, Anxiety and stress among participants (*n* = 661).

Describing relation between sociodemographic characteristics and the psychological impact (Depression, anxiety & stress), table 2 shows statistically significant relation between depression and characteristics of participant's specifically; nationality, age, marital status, education and employee status $p<0.05$. There is statistically significant relation between anxiety and sex. There is significant relation between stress and educational level.

**Table 2** Relation between sociodemographic variables and the psychological impact (Depression, anxiety & stress) during the epidemic (*n* = 661).

| Parameters | Depression | p.v | Anxiety | p.v | Stress | p.v |
|---|---|---|---|---|---|---|
| Nationality | | | 140(20.3%) | | 18(2.7%) | |
| Saudi | 186 (28.1%) | | 10(1.6%) | 560 | 0(0.0%) | .340 |
| Non Saudi | 22( 3.45) | .000 | | | | |
| Sex | | | 45(6.9%) | | 5(0.8%) | |
| Males | 78((11.9%) | .011 | 105(15%) | | 13(2.0%) | .125 |
| Females | 130(19.7%) | | | .000 | | |
| Age per years | 71(10.8%) | | 51(7.7%) | | 4(0.6%) | |
| Less than 20 | 82(12.4%) | | 59(9%) | | 9(1.4%) | |
| 21- 30 | 18 (2.7%) | | 14(2.2%) | | 0(0.0%) | |
| 31-40 | 37(5.5%) | .005 | 26(4%) | .258 | 5(0.8%) | .209 |
| Greater than 40 | | | | | | |
| marital status | | | | | | |
| Married | 53(8.3%) | .004 | 34(5.3%) | .020 | 4(0.6%) | .369 |
| Single | 147(22.9%) | | 99(15.5%) | | 12(1.6%) | |
| Education | | | | | | |
| Less secondary | 15(2.3%) | | 30(1.7%) | | 3(0.5%) | |
| Secondary | 75(11.3%) | | 48(7.3%) | | 6(0.9%0 | |
| University | 101(15.3%) | | 78(11.8%) | | 6(0.6%) | |
| Above university | 17(2.6%) | .001 | 33(2.1%) | .006 | 3(0.5%) | .004 |
| Employee status | | | 33(5%) | | | |
| Employee | 45(6.9%) | | 33(5%) | | 4(o.6%0 | |
| Not employee | 48(7.3%) | | 84(12.8%) | | 7(1.1%) | .398 |
| Student | 115(17.4%) | .003 | | .150 | 7(1.1%) | |

The table 3 shows that depression was significantly and positively correlated with anxiety and stress(r=.651 & r= .683) respectively. There is statistically significant correlation between anxiety and depression, stress level that describe feelings and emotions of studied participant's p=.0001 One the same line there is statistically significant positive correlation between stress and the depression, anxiety level that describe feelings and emotional pressure of studied participant's p=.0001

**Table 3** Correlations and Descriptive Statistics for all Variables in the Study n=661.

| | | Depression | Anxiety | Stress |
|---|---|---|---|---|
| Depression | Pearson Correlation | 1 | .651** | .683** |
| | p.v | | .000 | .000 |
| Anxiety | Pearson Correlation | .651** | 1 | .732** |
| | p.v | .000 | | .000 |
| Stress | Pearson Correlation | .683** | .732** | 1 |
| | p.v | .000 | .000 | |

The multivariate analysis in Table 4 displayed that the depression score is a positive statistically significant independent predictor of nationality and sex and marital status. It explained 0.069% of its variance. Table 5 demonstrated that the anxiety score

is a positive statistically significant independent predictor of sex and marital status. Together, these two factors explain .080% of its variance. As shown in Table 6, the Saudi participants are a predictor of the stress, whereas education is a negative not statistically significant independent predictor of the stress score. It explained .057% of its variance.

**Table 4** Best fitting multiple linear regression models for the depression score.

| | Unstandardized Coefficients | | Standardized Coefficients | t-test | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| Constant | -4.869 | 2.388 | | -2.039 | .042 |
| Nationality | 2.970 | .991 | .114 | 2.996 | .003 |
| Sex | 1.851 | .435 | .168 | 4.260 | .000 |
| Age | .544 | .340 | .100 | 1.601 | .110 |
| Marital status | 2.197 | .690 | .190 | 3.183 | .002 |
| Education | .073 | .348 | .009 | .210 | .834 |
| Employment | .572 | .338 | .088 | 1.693 | .091 |

r- Square=.069          Model ANOVA: F=8.116, p<0.001

**Table 5** Best fitting multiple linear regression model for the anxiety score.

| | Unstandardized Coefficients | | Standardized Coefficients | t-test | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| Constant | -4.922 | 2.161 | | -2.278 | .023 |
| Nationality | .318 | .897 | .013 | .354 | .723 |
| Sex | 2.528 | .393 | .251 | 6.428 | .000 |
| Age | .539 | .308 | .109 | 1.752 | .080 |
| Marital status | 2.021 | .624 | .193 | 3.236 | .001 |
| Education | .131 | .314 | .017 | .417 | .677 |
| Employment | .488 | .306 | .083 | 1.597 | .111 |

r-square=.080          Model ANOVA: F=9.485, p<0.001.

**Table 6** Best fitting multiple linear regression model for the stress score.

| | Unstandardized Coefficients | | Standardized Coefficients | t-test | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| Constant | -2.151 | 1.644 | | -1.309 | .191 |
| Nationality | .986 | .682 | .055 | 1.445 | .149 |
| Sex | 1.223 | .299 | .162 | 4.087 | .000 |
| Age | .309 | .234 | .083 | 1.321 | .187 |
| Marital status | 1.388 | .475 | .176 | 2.923 | .004 |
| Education | -.281 | .239 | -.048 | -1.173 | .241 |
| Employment | .307 | .233 | .069 | 1.319 | .188 |

r-square=.057          Model ANOVA: F=6.586, p<0.001.

## 4. DISCUSSION

The COVID-19 pandemic causing many psychological problems for all nationalities, age, and genders, including depression, stress, and anxiety, as the statistical results showed that 56.9% of the participants had psychological problems. Alkhamees et al., (2020) said that a quarter of the people who conducted the study suffered from mental illness, what make it worse at the beginning of the pandemic. The focus was on studying the disease and its symptoms, and how it is transmitted, and how to avoid it, clinical treatment, and finding vaccine, however, the psychological aspect is important in recovery process.

As Bohmwald, (2018) said in his article, the focus is always on clinical treatment methods, symptoms and signs, ignoring the psychological aspect. One of the most psychological illnesses that occurred in the pandemic is depression as evidenced by 208 out of 661 participants, this means that a third of the participants suffered from depression of all the degrees.

The main cause of depression in the pandemic was the isolation (Xiang, 2020). Health isolation, preventive measures, and social and psychological impact affect the people (Rubin, 2020). The most harmful effect is the view on people on lockdown from those who are outside.

## 5. CONCLUSION

Although, number of researches have been done to estimate the effect of COVID-19 on the general population worldwide, the uniqueness of present study found that, COVID-19 pandemic has created to some extended psychological challenges for recovered patients in Taif city, Saudi Arabia. Therefore, researchers' revealed, higher rate of psychological conditions & there was a statistically significant relation between depression and characteristics of studied participant's specifically; nationality, age, marital status, and education and employee status.  There is statistically significant relation between anxiety and sex. Additionally, there is statistically significant relation between stress and educational level. Also there is statistically significant positive correlation between anxiety and depression.

**Limitation**

The study focused on three psychological problems only, which are depression, anxiety and tension, and they may be the basis of the natural reaction to the disease, and it was better to expand more psychological problems, finally, there is a need for further researches to evaluate the effect of this pandemic in other communities at Saudi Arabia.

**Conflicts of interest**

The authors declare that there are no conflicts of interests.

**Data and materials availability**

All data associated with this study are present in the paper.

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