AN ARTIFICIAL INTELLIGENCE HEALTHCARE STUDY ON STRESS AND ITS COPING STRATEGIES AMONG GENERAL PUBLIC DURING COVID-19

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ABSTRACT

Stress is the discomfort and tension arising in a particular situation. India is undergoing Lockdown period of 21 days due to the pandemic disease named as Covid-19. As the public are asked to remain at home for the period, the people may feel discomfort and result in stressful situations. This article is focussed to study on the stress levels prevailing in the public and the various coping measures taken by them to overcome this stressful environment in healthcare using Artificial Intelligence. A total of 661 adults with chronic illness were screened. Another modelling method was used. Correlation analysis was used to determine the association between stress symptoms associated with COVID-19 and anti-inflammatory approaches. Pearson’s coefficient (r) is calculated by a 95% confidence interval (CI) to measure the strength of the correlation between each variable and the independent variable. Finally, the difference between the mean values (p-value <0.05 was specified) was used to measure the correlations between the variables. The data is collected from 62 respondents from various districts of Tamilnadu. The study reveals that stress is present in the public and they are handling the situation in a best manner by keeping themselves fit both physically and mentally.

Keywords: Artificial Intelligence, Healthcare, Stress Management, Covid-19

I. INTRODUCTION

Stress is the reaction of people towards various changes and situations which occur in their life. The experiences of person differ according to their perception of the situation and its effects. The common life events can cause stress among people. Some life threatening events may create intense stress both physiologically and psychologically due to high level of uncertainty [5].

Stress symptoms can be physical, mental or emotional. The stress can lead to high health risks and also affect relationships. Stress can also create physical disorders and behavioural changes. When a person is not able to handle his stress effectively, it may lead to Depression. Depression is prolonged stress, which causes serious problems in health conditions and relationships.

It soon became clear that health workers and emergency workers had high levels of infection and that the illegal nature of on-site protection and response protocols, the rate of infection, the severity of the infection, the severity of patients, and mortality index. The following data from the Italian National Institute of Health (2020) indicate that the most severe cases of health workers being forced to work, especially in the most affected areas of northern Italy, are: More than 150 doctors and 25,000 go and become health workers. The disease causes 30,000 deaths in 11 weeks and 220,000 victims in the general population.

A review of 14 studies published between January and March 2020 to identify traumatic experiences of healthcare professionals exposed to COVID-19 shows that they have observed symptoms of depression and anxiety. Again, the severity of these symptoms was influenced by age, gender, occupation, skills, type of experience, and exposure to COVID-19 patients; however, protection, resilience, and social support coincided with their response to concerns (Bohlken et al., 2020).
On 25th March, 2020, the Government of India underwent a national lockdown for 21 days, as a preventive measure against Corona virus (COVID-19) pandemic in India. The entire country is in lockdown, which lead affect the people from their routine work. The uncertainty situation may lead to stress affecting their health and family relationship. People have to adopt various coping strategies to reduce stress [1-25].

II. REVIEW OF LITERATURE

Moorhead & Griffin (1995), have said that stress can be accepted and tolerated by some people, while some people are not able to handle it. When is person is under stress, he / she gets confused. Then the person tries to control stress using his physical and mental strength. If the stress continues, he/she gives up and it affects the person.

Giga, L. Cooper, & Faragher (2003), have viewed that stress can be an environmental stimulus. It can be a reaction to more burden for person. It can also be a response to pressure of a person.

Mohsenzadeh (2007) has viewed that stress can provide serious reactions to a person’s mental, physical and emotional health.

Sasangohar et al., 2020; Valton et al., 2020 According to other studies, we found that COVID-19 emergency healthcare workers are particularly exposed to certain stressors that affect the areas of the organization and their stress and consequences. They feel ineffective as they have to intervene without many tools and resources. They also found deep emotional responses to anger, helplessness, and frustration due to the inevitable cognitive stress in terms of increased arousal levels. Many healthcare professionals experience physical stress not only from insomnia but also from the psycho-emotional stress they experience.

Martin Jayaraj, A & Dharmaraj, A (2017), suggested that having a simple schedule, being active daily, having fun and being creative in small activities may reduce stress

Though, many studies have been carried out on stress and its coping strategies, they are mostly focussed on individual and work related stress. The stress which has arisen due to fear of pandemic disease, loss of job and business, lack of essentials and uncertain future has not been addressed. This study attempts to study the stress and its coping strategies adopted by people during the lockdown period in Tamilnadu, India.

Objectives:
- To study the demographic profile of the respondents in Tamilnadu, India.
- To analyse Stress and coping strategies of public during lockdown period in Tamilnadu, India.

III. RESEARCH METHODOLOGY

The Researcher has attempted to study the presence of stress among public, hence descriptive research design is adopted for the study. The Convenient sampling technique was adopted for the study. The sample size was 62 respondents from various districts of Tamilnadu. The Primary data was collected using standardised Questionnaire sent through WhatsApp groups during the period of Lockdown in India. The secondary data was collected from journals, books and websites. The collected data was analysed using Henry Garrett Ranking test.

Limitations:
- The study is restricted to public people of various districts of Tamilnadu, India only.
- The sample size is restricted to 62 only.
- The opinion of the respondents may be biased.
- The data was collected on the 13th and 14th day during Lockdown period of 21 days from 25th March 2020 to 14th April 2020.

a. Sample size determination and Sampling technique
First, three districts were selected in each district using a simple random sampling system, and health facilities in each selected district were reselected using a simple random sampling system. Next, the calculated sample size was assigned to randomly selected public health facilities in three regions based on the number of chronic diseases admitted to each health facility. Each health unit used a simple random sampling system that used the client's registration number to select study subjects.

\[
\frac{(Z_\alpha)^2P(1-P)}{d^2} = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384
\]

Assumptions:

- \( n \) = the number of participants to be interviewed
- \( Z \) = standardized normal distribution value at the 95% CI, which is 1.96
- \( P \) = 50% was considered
- \( d \) = the margin of error, taken as 5% Because of the sampling procedure design effect of 1.5 was used.

b. Mental Health Problems Are Prevalent

Concerns about mental health are growing in higher education[54][55]. As a group of scientists interested in understanding the psychological burden of graduate students in biomedicine, we recently conducted a survey and about half of all graduate students in biomedicine at today's headquarters for research have the same idea. I learned that I was approaching the threshold to be noticed and instability and two-thirds of her life. These findings reflect some of the findings of scientific studies in the United States and worldwide, as well as extensive research (National Science Foundation and Nature). These studies have strongly supported the fact that a gradual student with a mental health problem is a growing problem that needs to be addressed. The major governing bodies (National Academy of Sciences, National Institutes of Health, NIH On-Campus Teaching and Education Bureau) and educational institutions (Type, The Chronicle of Higher Education, Inside Higher Ed) also emphasize the speed of intervention mental health problem.

c. Physical activity

Social isolation refers to increased illness due to chronic illness and higher mortality due to all causes. Ill behaviours, such as smoking and reduced physical activity, can cause more than 30% of these effects. Data from adults aged 50 to 81 years suggest that social isolation is independently associated with decreased physical activity and increased inactivity, suggesting that this may play a role in increased physical activity. During the COVID-19 pandemic, reducing the negative effects of isolation and maintaining physical activity levels in older adults is important to protect health by reducing social networks and access to health facilities, fitness and relaxation.

d. Mental health

Social isolation has important effects on the mental health of the elderly. Social isolation and the perception of loneliness cause various psychological symptoms. It includes depression and anxiety and negatively affects quality of life. Social isolation and depression can be achieved by physical activity outside of the home. Social isolation that occurs in the context of a pandemic is different from what occurs under normal circumstances. During the disease outbreak, quarantine is associated with symptoms of anxiety, depression, and post-traumatic stress disorder, and some research evidence even suggests that these symptoms may persist for a long time. Quarantine for more than 10 days, fear, frustration and boredom associated with infection, and lack of information and materials were identified as factors associated with adverse outcomes. Studies typically involve a quarantine period of less than three weeks.

e. People needs with disabilities during the COVID-19 outbreak

Environmental barriers for children and adolescents with mental health needs
In order to promote health, prevent the spread of infections and reduce stress in the community, information and communication on risks are often not improved and communication with people with disabilities does not take place.

Many people with reduced mobility do not have access to many health services.

Urban barriers and open public transport networks make it difficult for people with disabilities to access healthcare.

f. Refugees’ and Migrants’ Mental Health

Many of these people live, travel, and work in situations where physical distance and recommended hygiene measures are not possible due to poor living conditions and high economic instability. As these people are already marginalized, the following points need to be taken into account to ensure ethical social justice: Refugees and migrants are vulnerable to mental health problems because pre-trip, post-trip and post-arrival events are complex and stressful. Lack of knowledge, cultural and linguistic barriers can reduce and impair access to health services and other social infrastructure. According to a study in Austria, the proportion of refugees with a moderate or severe mental health problem is high (32%). For example, young refugees (aged 15-34) are at high risk experienced discrimination and fear of surviving spouses and children.

IV. PARTICIPANTS AND PROCEDURES

Participants were voluntarily selected with cross-sectional samples to investigate the emergency situation in the event of a pandemic. We used an Internet platform to conduct the study and contacted participants through social media, private mailing lists, and forums. Participants from all regions of Italy completed an online questionnaire. The sample included 210 participants, 90 men, and 120 women with a mean age of 42.53. In addition, 52.9% of the sample was married, 10.6% divorced, and the remaining 36.5% were unmarried.

An online questionnaire was used in this study and COVID-19 was performed during seizures due to seizures. The questionnaire consisted of three parts: one for each informed online consent and entry-level pseudo-demographic collection, and a set of online questions, as described in the next section. Participants maintained anonymous data collection and all procedures are approved by the Institutional Ethics Committee.

V. MENTAL HEALTH ISSUES AS A RESULT OF COVID-19

Since it can affect people of all sexes and types, it is understood that the onset of mental health problems such as anxiety or depression can lead to bad behaviour in people with dementia. In each case, symptoms of a new mental illness in people with mental illness can accelerate or worsen the pre-existing state of mental illness, as well as cause the following concerns: Individuals may experience fear and fear. Anxiety about the patient dying, becoming destitute or blaming other sick people and can create deceptive thoughts regardless of what they have hurt.

Let us not forget that even the ability to isolate oneself in quarantine is a privilege. This means that someone has a shelter and can pay to stop or reduce work or work from home. This also means they will still have a steady job. But many people around the world make a living every day, often in the informal sector, literally living from hand to mouth. These people just can’t afford or be allowed not to work or stay home (if they have everything). In addition, the lack of protective equipment when they do not even have access to (running) water or soap is a reality that unfortunately applies to many people around the world. Their fears and risks of possible infection and exposure to the virus may be even greater than those of others who could at least implement self-defence strategies.

VI. RESULTS AND DISCUSSION

The demographic profile of selected respondents is being studied to understand the frequency of distribution of public people in various districts of Tamilnadu, India.

In addition, this study did not consider differences in gender, culture, and socioeconomic status. Future research could focus on these aspects, considering the growing problem of virulence in women or in comfortable places, with discounts with plenty of food and resources to overcome barriers and social distance in comfortable places. Housing, employment or the possibility of being affected by participants and friends and family were not explored. This may be a major challenge for future research, given the spread of the virus, the high pressure on health professionals and the difficulties faced by relatives of patients. The current literature has highlighted the significant psychosocial symptoms in the effects of the COVID-19 pandemic, the risk of a serious mental health impact now and in the long term overall (for review, see [55]). However, previous research has highlighted the
need to highlight both the effects of psychosis associated with the spread of epidemic diseases, as well as the factors that deal with these critical events on an emotional level. Therefore, the aim of this study was to delve into objective variables that may have a protective effect against disease in the COVID-19 phase, finding pathways between life satisfaction and subjective stress, as well as treatment mechanisms. Role positive behaviour and strong defense mechanisms of this relationship.

Table I: Demographic Profile

<table>
<thead>
<tr>
<th>Demographic Profile</th>
<th>Parameter</th>
<th>Frequency</th>
<th>Percent-age</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20–30</td>
<td>57</td>
<td>91.9</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>30–40</td>
<td>4</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-50</td>
<td>1</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>41</td>
<td>66.13</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>21</td>
<td>33.87</td>
<td></td>
</tr>
<tr>
<td>No of Family Members</td>
<td>1 – 3</td>
<td>16</td>
<td>25.81</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>46</td>
<td>74.19</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 denotes that majority of the respondents are from the age group of 20 – 30 (91.9%). The stress faced by young people are been addressed. The Male (66.13%) have been the respondents for the study on stress management as they are more likely to get stress symptoms being in lockdown period. The majority of the respondents have 4-6 family members (74.19), which helps them to share their feelings with family members and reduce their stress levels.

Figure 1. Perceived stress score of BSc Nursing students in regard to COVID 19 lockdown

Table II: Stress Symptoms

<table>
<thead>
<tr>
<th>S. No</th>
<th>Stress Symptoms</th>
<th>Score</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moody</td>
<td>2720</td>
<td>43.87</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Irritability</td>
<td>2860</td>
<td>46.13</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Short- temper</td>
<td>2820</td>
<td>45.48</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Accelerated Speech</td>
<td>2740</td>
<td>44.19</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Restlessness</td>
<td>2760</td>
<td>44.52</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Lack of Confidence</td>
<td>2840</td>
<td>45.81</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Getting confused easily</td>
<td>2480</td>
<td>40.00</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>Under eating/Over eating</td>
<td>3020</td>
<td>48.71</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Feeling negatively</td>
<td>2480</td>
<td>40.00</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>Worrying</td>
<td>2940</td>
<td>47.42</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Nervousness</td>
<td>2940</td>
<td>47.42</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Sleep disturbances</td>
<td>2780</td>
<td>44.84</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>Tendency to remain alone</td>
<td>2800</td>
<td>45.16</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>Shouting at family members</td>
<td>2600</td>
<td>41.94</td>
<td>12</td>
</tr>
</tbody>
</table>
Table 2 shows that the majority of the people perceive that they possess the stress symptom ‘Under eating/Over eating’ as it is ranked first with 3020 score points. The second rank is provided to ‘Worrying’ and ‘Nervousness’ with Garrett score of 2940. The fourth and fifth rank is given to ‘Irritability’ and ‘Lack of Confidence’ with 2860 and 2840 scores.

![Figure.2 mediation of approach coping, positive attitude, and mature defences](image)

The sixth and seventh rank is given to ‘Short Temper’ and ‘Tendency to remain alone’ with 2820 and 2800 scores. The eighth and ninth rank is given to ‘Sleep Disturbances’ and ‘Restlessness’ with 2780 and 2760 scores. The tenth and eleventh rank is given to ‘Accelerated Speech’ and ‘Moody’ with 2740 and 2720 scores. The twelfth rank is given to ‘Shouting at family members’ with 2600 scores. ‘Getting confused easily’ and ‘Feeling Negatively’ are ranked last with 2480 points. Thus, ‘Over/under eating, worrying and nervousness are considered to be the most stress symptom among the people at lockdown period in Tamilnadu.

Table III. Stress Coping Strategies

<table>
<thead>
<tr>
<th>S. No</th>
<th>Stress coping strategies</th>
<th>Score</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yoga/Meditation</td>
<td>2780</td>
<td>44.84</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Physical exercise</td>
<td>3640</td>
<td>58.71</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Entertainment</td>
<td>4360</td>
<td>70.32</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Away from stressful Environment</td>
<td>3740</td>
<td>60.32</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Sleep</td>
<td>3900</td>
<td>62.90</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Speaking with Likeminded Persons</td>
<td>4020</td>
<td>64.84</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Playing with pet animals</td>
<td>3420</td>
<td>55.16</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Prayer</td>
<td>3320</td>
<td>53.55</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Positive thinking</td>
<td>4340</td>
<td>70.00</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Spending time with family</td>
<td>4600</td>
<td>74.19</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3 shows that the majority of the people use the stress coping strategy ‘Spending time with Family’ as it is ranked first with 4600 score points. The second and third rank is provided to ‘Entertainment’ and ‘Positive Thinking’ with Garrett scores of 4360 and 4340. The fourth and fifth rank is given to ‘Speaking with likeminded persons’ and ‘Sleep’ with 4020 and 3900 scores. The sixth and seventh rank is given to ‘Away from stressful environment’ and ‘Physical Exercises’ with 3740 and 3640 scores. The eighth and ninth rank is given to ‘Playing with pet animals’ and ‘Prayer’ with 3420 and 3320 scores. ‘Yoga/Meditation’ is ranked last with 2780 points. Thus, spending time with family and Entertainment are considered to be the most stress coping strategy followed by the people at lockdown period in Tamilnadu.

Thus a low level of stress is prevailing among the people of Tamilnadu, India during the lockdown period, yet they are able to handle this situation of fear and worry by spending more time with family and diverting themselves into entertainment zones through television and mobile phones. Thus the people are mentally and emotionally content. They may engage themselves in Yoga and Physical activities at home to maintain their health also.

About 613 participants with a response rate of 96% attended. About 68.4% are under moderate pressure. Depression 17.8% and maximum stress 13.9%. Concerns related to Covid-19 include aggression, aggression,
Stress is imminent in human life. People have to undergo the stress at various lifecycles. The levels of stress determine the risk of physical, mental and emotional health. When a person has low level of stress, it is likely for him to tolerate the stress and overcome it. But when a person faces an uncertain event, he perceives stress. The perception of the person and the coping strategies adopted by him helps him to tackle the stress from affecting his personal life. The results indicate the launch of a large and sustainable public awareness program to improve general population information, targeted methods of infection and situation-specific prevention strategies, in combating mistrust, myths and misconceptions. Strengthening the health system should be accompanied by providing vital information to health care professionals primarily about mental health services to increase their self-esteem, resilience and ability to respond to fever. In addition, these findings serve as a benchmark and inspiration for future research into mental health on resilience and the need for resilience-based interventions, training and support for emergency workers in Pakistan and the region. It can help government agencies and health workers maintain the psychological well-being of health workers before the outbreak of COVID-19 in Pakistan and various parts of the world. The Lockdown period in India has less to a stressful situation, yet the people are handling it very well by the various strategies and with a hope of a better future.

VII. CONCLUSION

Stress is imminent in human life. People have to undergo the stress at various lifecycles. The levels of stress determine the risk of physical, mental and emotional health. When a person has low level of stress, it is likely for him to tolerate the stress and overcome it. But when a person faces an uncertain event, he perceives stress. The perception of the person and the coping strategies adopted by him helps him to tackle the stress from affecting his personal life. The results indicate the launch of a large and sustainable public awareness program to improve general population information, targeted methods of infection and situation-specific prevention strategies, in combating mistrust, myths and misconceptions. Strengthening the health system should be accompanied by providing vital information to health care professionals primarily about mental health services to increase their self-esteem, resilience and ability to respond to fever. In addition, these findings serve as a benchmark and inspiration for future research into mental health on resilience and the need for resilience-based interventions, training and support for emergency workers in Pakistan and the region. It can help government agencies and health workers maintain the psychological well-being of health workers before the outbreak of COVID-19 in Pakistan and various parts of the world. The Lockdown period in India has less to a stressful situation, yet the people are handling it very well by the various strategies and with a hope of a better future.

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