COVID-19 and Mental Health: A Cross-Sectional Study on Mental Health Impact Of COVID-19 Among People In Kerala

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Abstract: The global pandemic COVID-19 has raised an enormous threat to the world's health care services, economy, socio-political bodies, and infrastructure. This pandemic has negatively affected both physical and mental health. Mental well- being is more than the existence or absence of mental illness. It is an intersection between emotional, psychological, social, and physical well-being. Many persons have experienced significant mental health problems this year. Public health interventions related to COVID-19, including quarantines and lock-downs, can have a detrimental effect on people's mental health status through environmental change, disruption of services, self, social isolation, financial uncertainty, and work loss enhanced stress. The purpose of the study was to investigate the gender differences of mental health (perceived stress, anxiety, and depression) and explored associated factors during the COVID-19 epidemic among peoples living in Alappuzha, Pathanamthitta, and Kollam district.

Keywords: COVID-19 Pandemic, Anxiety, Stress, Depres- sion, Perceived Stress Scale-4 (PSS-4), Patient Health Question-naire for Depression and Anxiety-4 (PHQ-4), Survey

1. Introduction

He Novel COVID-19 pandemic has been considered tobe one of the tragic health-care and economic crises

of recent times. In India alone, the daily rise in COVID-19 patients was registered above 15,000 for the three consecutive days on February 2021 and pushing India's case tally to more than 11 million, while the recoveries surged to approximately 10 Million, as of February 2021, according to the latest Union Health Ministry data. Over the last one and a half years, there has been a notable increase in the number of infected cases and mortality due to this COVID-19.

2. Literature Survey

The COVID-19 epidemic was initiated from the Wuhan city of China and then rapidly and subsequently spread across the globe [1]. It has been observed over the past several months that the regular health services, which include mental health care and other mental well beings, are unfavorably affected in many countries across the world, including India. Simultaneously, several media reports are indicating the fact that an increase in mental health issues such as depression, anxiety, insomnia, post-traumatic stress-like symptoms, and anger among the people, health care workers, and as well

as people who are kept in quarantine/isolation (due to infection with COVID-19 or contact with COVID-19 infected persons) [2]. The rapidly emerging mental health issues may weaken one's general well-being and may lead to massive potential to influence the health care system. Hence, they need desperate and urgent action and attention. There are various factors of risk that ascribe to the evolution of psychological parameters/symptoms during the COVID-19 pandemic. Under suitable and reasonable stress, anybody can encounter mental illness or morbidness symptoms after a disquieting event and this kind of pandemics, which has the capability of persuading a lot of stress and anxiety among large populations. Also, several other factors decide the possibility of a person developing these tragic conditions [1] [3]. The conditions that pave the way for the incident; the type of the traumatic incident happening; the situations after the incident; rapidity of the incident; the level of precariousness involved; the latent for individual risk and risk to their family and their loved ones; and the total impact on the country's economy, jobs and job opportunities, socio-political organizations, etc., are some of the several major factors determining the outcome [4]. A recently evaluated systematic review and meta-study and its analysis on the pervasiveness of psychological morbidness among the population, front-line workers, health-care workers, and COVID-19 patients amongst this COVID-19 pandemic reported that approximately half the overall population faced specific psychological effects of the COVID-19 pandemic [5] stress and anxiety (34%), Improper sleeping standard (40%), and psychological depression (34%) were the foremost com- monly reported impacts across multiple studies [1]. An online survey reported that about 41% of the respondents reported anxiety or depression. About (75%) of the respondents were reported to have a moderate level of stress, and 72% reported poor health [6].

A. Objectives

- To study the impact of the COVID 19 outbreak in the mental health of people living in Alappuzha, Kollam, andPathanamthitta
- To study the factors of mental health deterioration duringthe COVID-19 pandemic situation.
- To find out which class of Gender is more mentallyaffected by COVID-19.

Hypothesis

- **Mental Health Vs Districts**

H_0: The mental health of people is independent of the districts (Alappuzha, Pathanamthitta and Kollam) to which they belong.

H_1: The mental health of people is dependent of the dis- tricts (Alappuzha, Pathanamthitta and Kollam) to which they belong.

- **Mental Health Vs Gender**

H_0: The mental health status and Gender of the peopleare not related.

H_1: The mental health status and Gender of the peopleare related.

- **Mental Health Vs Age Group**

H_0: The mental health status and Age Group of the people are not related

H_1: The mental health status and Age Group of the peopleare related.

- **Mental Health Vs Employability**

H_0: The mental health status and Employability of the people are not dependent.

H_1: The mental health status and Employability of the people independent.

Variables	**Frequency (n=115)**	**Percentage(%)**
GENDER		
Male	51	44.35%
Female	64	55.65%
AGE GROUP		
18-25 Years	50	43.50%
26-35 Years	28	24.30%
36-45 Years	11	9.60%
46-65 Years	15	13.00%
65 Years and above	11	9.60%
DISTRICT		
Alappuzha	38	33.04%
Kollam	33	28.70%
Pathanamthitta	44	38.26%
EMPLOYABILITY		
Full time employed	34	29.57%
Part time employed	7	6.09%
Self Employed	18	15.65%
Unemployed	20	17.39%
Student	27	23.48%
Retired	9	7.83%

TABLE I: Socio-demographic characteristics of the partici-pants

3. Research Methodology

A. Study setting and design

A cross-sectional study and survey were undertaken in January 2021 and February 2021 among the people in Alap-

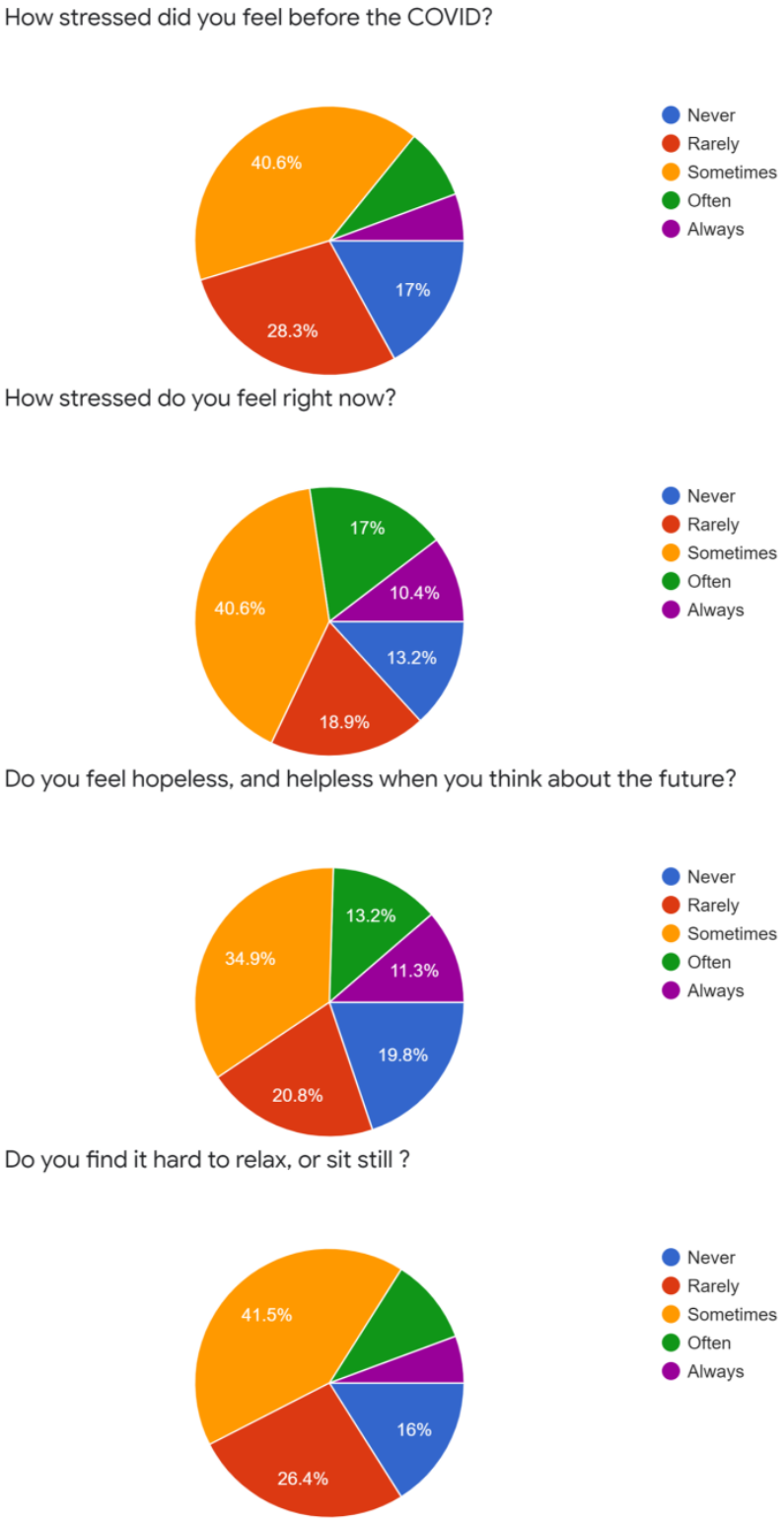

Fig. 1: Perceived Stress Scale (PSS)-4 among the people in three districts

puzha, Pathanamthitta, and Kollam. A self-managed and self- administered online-based questionnaire was developed in Google Forms and was widely circulated to the three districts' residents via social media. All the responses and records were kept anonymous, and no personal information, including name, age, email, etc. were divulged in any means.

B. Materials and Methods

An online questionnaire was created in Google Forms and was distributed to all study participants. The questionnaire started with some socio-demographic questions and ended with questions based on anxiety and stress. Once the par-ticipants filled in the multiple-choice questions, they were

ANXIETY, DEPRESSION AND STRESS SCORES USING PSS AND PHQ SCORES	**GENDER**	
	MALE	FEMALE
	Mean ± SD	Mean ± SD
PSS-Q1 (Do you constantly worry of being affected by COVID 19?)	2.96 ± 1.19	3.17 ± 1.26
PSS-Q2 (Do you worry too much about the effect of COVID on your employment status?)	2.66 ± 1.05	2.39 ± 1.06
PSS-Q3 (Do you find it hard to relax, or sit still?)	3.17 ± 1.03	2.89 ± 1.23
PSS-Q4 (Do you find difficulty in Focusing on everyday tasks?)	2.52 ± 1.31	2.98 ± 1.41
PSS-Q5 (Whether your sleeping patterns have been disrupted now?)	2.58 ± 1.12	2.85 ± 1.01
PSS-Q6 (Do you feel hopeless, and helpless when you think about the future?)	2.51 ± 1.15	2.92 ± 1.09
PSS-Q7 (When you wake up in the morning, did you feel there is nothing to look forward to?)	2.58 ± 1.28	2.95 ± 1.16
PSS-Q8 (Do you have a persistent feeling of emptiness?)	2.52 ± 1.12	2.95 ± 1.29
PSS-Q9 (Do you feel slow down (physically and mentally)?)	2.63 ± 1.25	2.71 ± 1.16
PSS-Q10 (Do you compare your conditions with others?)	2.62 ± 1.24	2.71 ± 1.07
PSS-Q11 (Do you find difficulty in taking decisions?)	2.68 ± 1.38	2.85 ± 1.27
PSS-Q12 (How stressed did you feel before the COVID?)	2.79 ± 1.21	2.96 ± 1.22
PSS-Q13 (How stressed do you feel right now)	2.41 ± 1.15	2.82 ± 0.86
PSS (Total)	2.32 ± 0.91	2.65 ± 0.78
PHQ-Q1 (Are you feeling depressed for most of the time?)	1.94 ± 0.90	2.35 ± 0.84
PHQ-Q2 (Do you worry too much about the effect of COVID on your health and safety?)	1.94 ± 0.96	2.03 ± 0.77
PHQ-Q3 (Do you worry too much about the effect of COVID on your family's health and safety?)	2.11 ± 0.88	2.28 ± 0.96
PHQ-Q4 (Do you worry too much about the effect of COVID on your financial status?)	2.48 ± 0.85	2.64 ± 0.94
PHQ-Q5 (Are you getting easily an1yed or irritable during COVID time than before?)	2.23 ± 0.92	2.41 ± 0.98
PHQ-Q6 (Have you lost interest in doing things?)	2.29 ± 1.08	2.26 ± 0.93
PHQ-Q7 (Do you have trouble in concentrating or focusing your mind?)	1.98 ± 0.86	2.20 ± 0.87
PHQ-Q8 (Do you feel bad about 1t being able to help yourself and your family?)	2.01 ± 0.92	2.21 ± 0.95
PHQ-Q9 (Do you have difficulty in adjusting with the new routines in this COVID period?)	2.16 ± 0.85	2.39 ± 1.36
PHQ-Q10 (Do you think COVID 19 has affected your mental status negatively?)	2.15 ± 0.87	2.35 ± 0.96
PHQ-Q11 (What is the serious issue that you faced during this COVID time?)	2.01 ± 0.96	2.04 ± 0.88
PHQ-4 (Total)	2.11 ± 0.76	2.36 ± 0.82

Table II: Descriptive statistical analysis of anxiety, depression, and stress using PSS and PHQ scores in male and femaleparticipants

ANXIETY, DEPRESSION AND STRESS SCORES USING PSS AND PHQ SCORES	**DISTRICTS**		
	ALAPPUZHA	KOLLAM	PATHANAMTHITTA
	Mean ± SD	Mean ± SD	Mean ± SD
PSS-Q1 (Do you constantly worry of being affected by COVID 19?)	2.89 ± 1.33	3.303 ± 1.04	3.06 ± 1.302
PSS-Q2 (Do you worry too much about the effect of COVID on your employment status?)	2.5 ± 1.24	2.69 ± 0.95	2.38 ± 0.92
PSS-Q3 (Do you find it hard to relax, or sit still?)	3.02 ± 1.34	3.12 ± 0.99	2.93 ± 1.10
PSS-Q4 (Do you find difficulty in Focusing on everyday tasks?)	2.89 ± 1.46	2.97 ± 1.40	2.61 ± 1.33
PSS-Q5 (Whether your sleeping patterns have been disrupted now?)	2.88 ± 1.13	2.88 ± 0.83	2.43 ± 1.12

PSS-Q6 (Do you feel hopeless, and helpless when you think about the future?)	2.78 ± 1.11	2.75 ± 0.93	2.65 ± 1.29
PSS-Q7 (When you wake up in the morning, did you feel there is nothing to look forward to?)	2.52 ± 1.03	3.15 ± 1.27	2.72 ± 1.31
PSS-Q8 (Do you have a persistent feeling of emptiness?)	2.92 ± 1.21	2.61 ± 1.14	2.75 ± 1.31
PSS-Q9 (Do you feel slow down (physically and mentally)?)	2.94 ± 1.21	2.88 ± 0.99	2.36 ± 1.14
PSS-Q10 (Do you compare your conditions with others?)	2.73 ± 1.13	3 ± 1.19	2.36 ± 1.08
PSS-Q11 (Do you find difficulty in taking decisions?)	2.55 ± 1.05	3.12 ± 1.13	2.63 ± 1.22
PSS-Q12 (How stressed did you feel before the COVID?)	2.86 ± 1.18	3.21 ± 1.26	2.52 ± 1.22
PSS-Q13 (How stressed do you feel right now?)	2.78 ± 0.99	2.63 ± 0.89	2.52 ± 1.13
PSS (Total)	2.34 ± 0.81	2.18 ± 0.88	1.95 ± 0.98
PHQ-Q1 (Are you feeling depressed for most of the time?)	2.09 ± 0.81	1.9 ± 0.76	1.93 ± 0.97
PHQ-Q2 (Do you worry too much about the effect of COVID on your health and safety?)	2.13 ± 0.94	2.27 ± 0.87	2.22 ± 0.98
PHQ-Q3 (Do you worry too much about the effect of COVID on your family's health and safety?)	2.59 ± 0.96	2.69 ± 0.85	2.34 ± 0.84
PHQ-Q4 (Do you worry too much about the effect of COVID on your financial status?	2.47 ± 0.96	2.52 ± 0.87	2.06 ± 0.97
PHQ-Q5 (Are you getting easily annoyed or irritable during COVID time than before?)	2.28 ± 1.01	2.39 ± 0.88	2.18 ± 1.08
PHQ-Q6 (Have you lost interest in doing things?)	2.16 ± 0.77	2.12 ± 0.83	2.02 ± 0.97
PHQ-Q7 (Do you have trouble in concentrating or focusing your mind?)	2.34 ± 0.96	2.06 ± 0.74	1.97 ± 0.95
PHQ-Q8 (Do you feel bad about 1t being able to help yourself and your family?)	2.39 ± 1.01	2.06 ± 0.74	2.31 ± 1.05
PHQ-Q9 (Do you have difficulty in adjusting with the new routines in this COVID period?)	2.28 ± 0.95	2.18 ± 0.81	2.36 ± 0.96
PHQ-Q10 (Do you think COVID 19 has affected your mental status negatively?)	1.97 ± 0.85	2.24 ± 0.93	1.93 ± 0.94
PHQ-Q11 (What is the serious issue that you faced during this COVID time?)	2.55 ± 0.86	2.81 ± 0.68	2.31 ± 0.93
PHQ-4 (Total)	2.39 ± 0.85	2.33 ± 0.69	2.11 ± 0.84

Table III: Descriptive statistical analysis of anxiety, depression, and stress using PSS and PHQ scores of people in 3 Districts

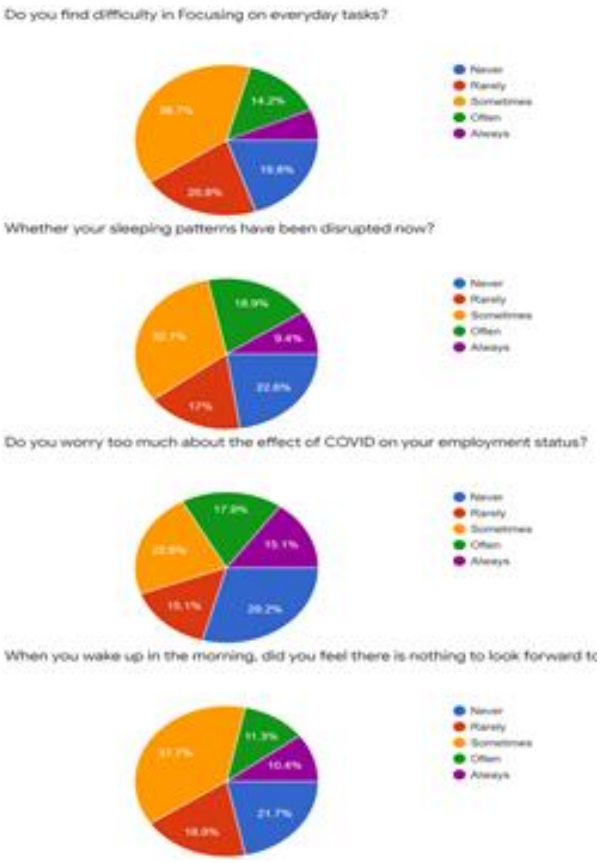

Fig. 2: Perceived Stress Scale (PSS)-4 among the people in three districts

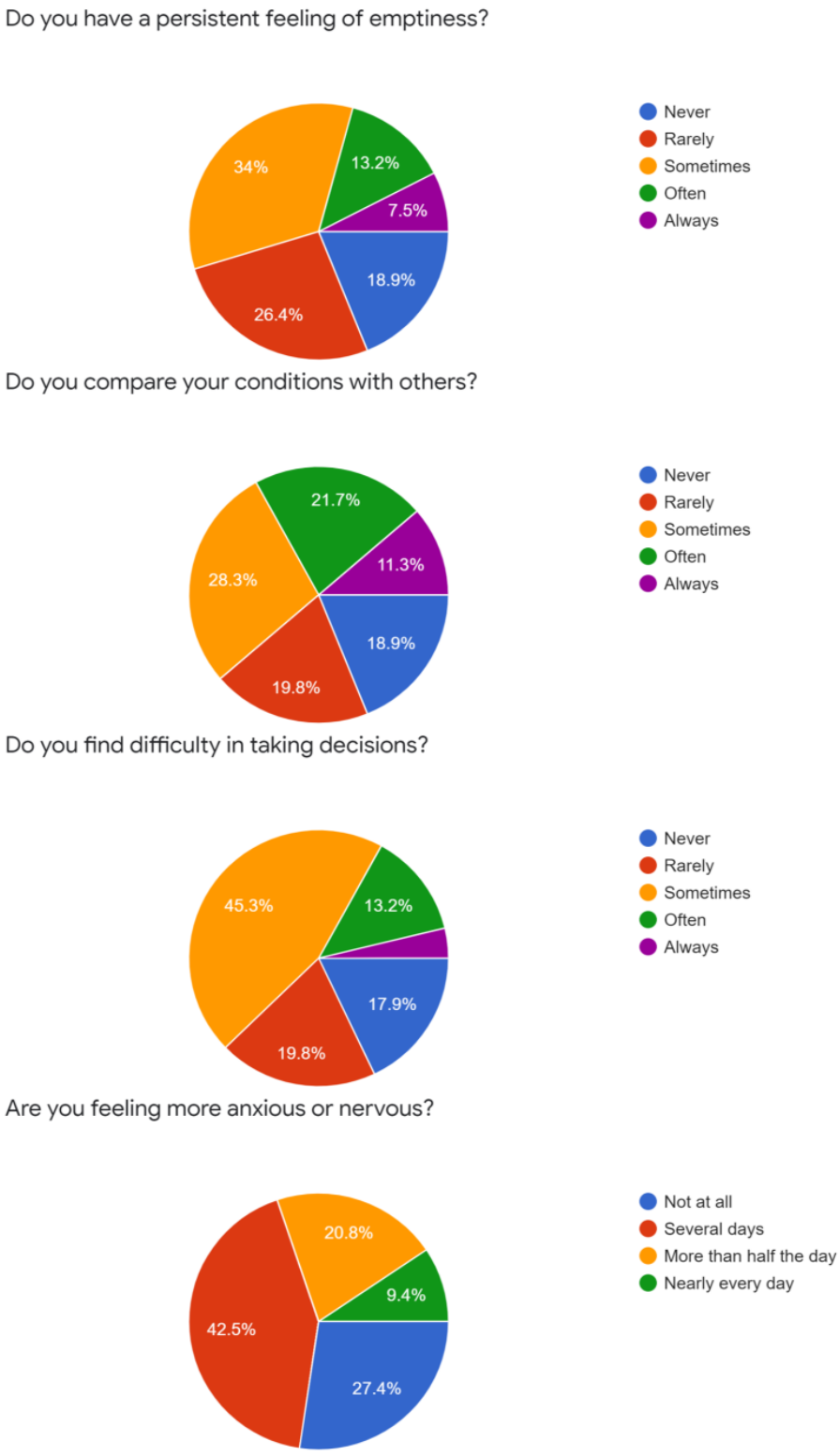

Fig. 3: Perceived Stress Scale (PSS)-4 among the people in three districts

redirected to another secure page to view their responses. This online survey took approximately two to three minutes.

For this study, we used two psychometric analysis scales, i.e., Patient Health Questionnaire for Depression and Anxiety (PHQ-4) and the Perceived Stress Scale (PSS-4). The PSS-4 is a self-analysis questionnaire developed by Cohen et. al. [7] in order to measure and evaluate the stress-full situations of a person in his/her previous

month. It has been used in studies assessing the stressful situations, [7] [8]the effectiveness of stress-reducing interventions, [9] [10] [11] [12] and the extent to which there are associations between psychological stress and psychiatric and physical [13] [14] [15]disorders. In our study, the PSS contained 13 statements that measured the participant's perception of stress on a 5-point Likert scale.

It included both positive and negative elements. The positive elements measured the degree of ability of the participants to cope with their existing stress, and the harmful elements intended to assess the lack of control and negatively affecting reactions.

In our study, the PSS-4 score ranges from 13-59 (low to high), with higher scores equating to higher stress. Since there are 13 questions, each with stress level as normal, mild, moderate, and severe, 13 is considered as the lowest score as those who answer normal is given 1 point, mild as 2 points, moderate as 3 points, and severe as 4 points. In this study, we have categorized the severity of stress level as normal (13-24), mild (25-36), moderate (37-48), and severe (49-59) based on the PSS-4 scores.

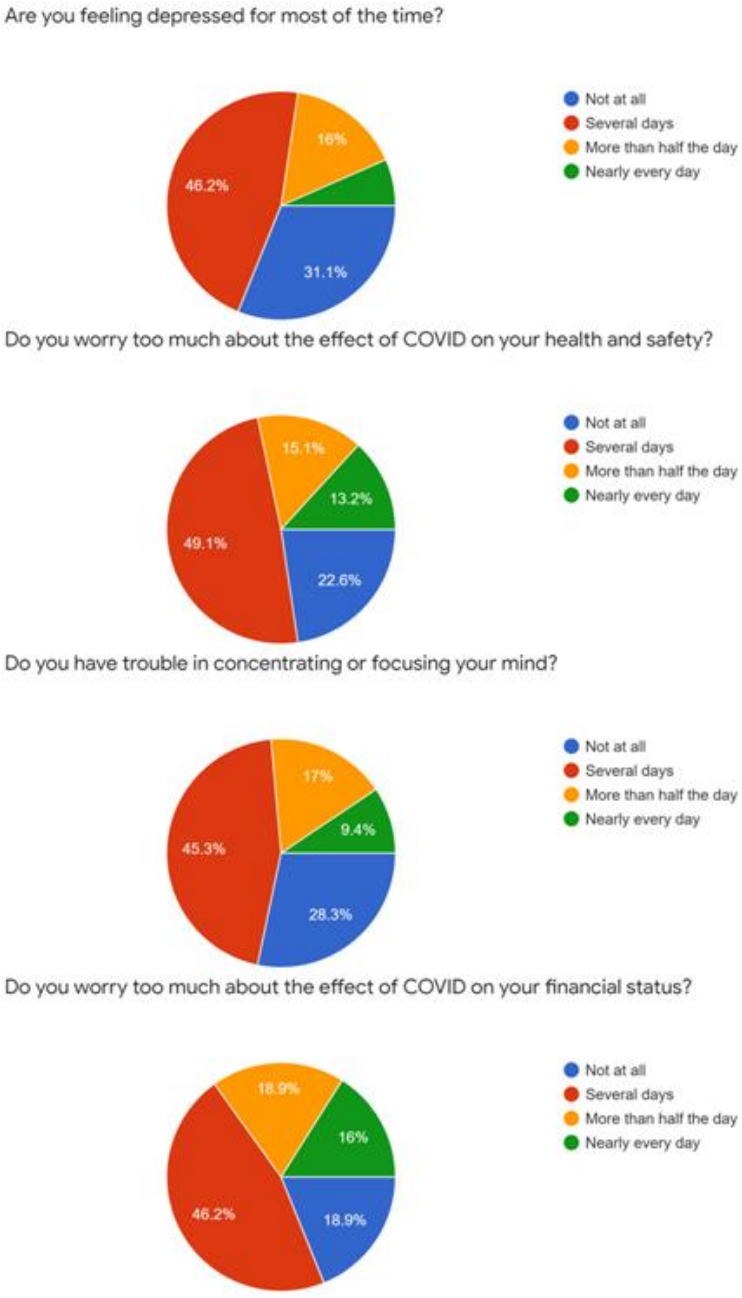

Fig. 4: Patient Health Questionnaire (PHQ-4) among the people in three districts

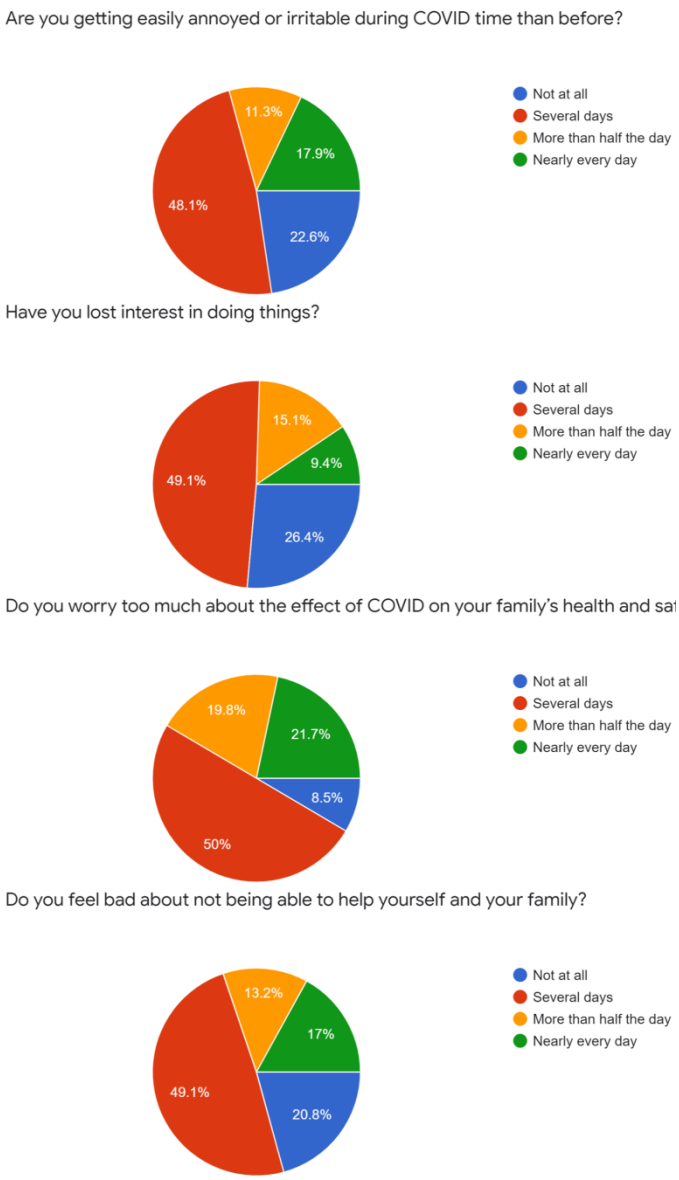

Fig. 5: Patient Health Questionnaire (PHQ-4) among the people in three districts

The Patient Health Questionnaire (PHQ-4) is a multiple- choice self-report ultra-brief screener inventory used as a screening and diagnostic tool for mental health disorders of depression, anxiety, alcohol, eating, and somatoform disorders. PHQ-4 combines the PHQ-2 with the Generalized Anxiety Disorder 2 (GAD-2), an ultra-brief anxiety screener containing the first two questions from the Generalized Anxiety Disorder 7 (GAD-7). The studies have confirmed its validity and reli- ability as a degree of measurement of depression and anxiety in the general population in the last two weeks [16] [17]. In our study, PHQ-4 contained 11 statements on a 5-point Likert scale, where the PHQ-4 score ranges from 11-41 (low to high), with higher scores equating to higher anxiety and depression. Since there are 11 questions, each with anxiety and depression level as normal, mild, moderate, and severe, 11 is considered the lowest score. Those who answer normal are given 1 point, mild as 2 points, moderate as 3 points, and severe as 4 points. In this study, we have categorized the severity level as normal (11-18), mild (19-26), moderate (27-34), and severe (35-41) based on the PHQ-4 scores.

C. Analyzing the Data

All the necessary analyses were performed in IBM SPSS 26.0. In the Descriptive analysis, i.e., for Categorical Variables, the Frequencies and Percentages were computed and, for Continuous Variables, the Mean (M) and Standard Deviation (SD) were calculated. Chi-Square Test was used to analyze and explore the significant relationships and associations between

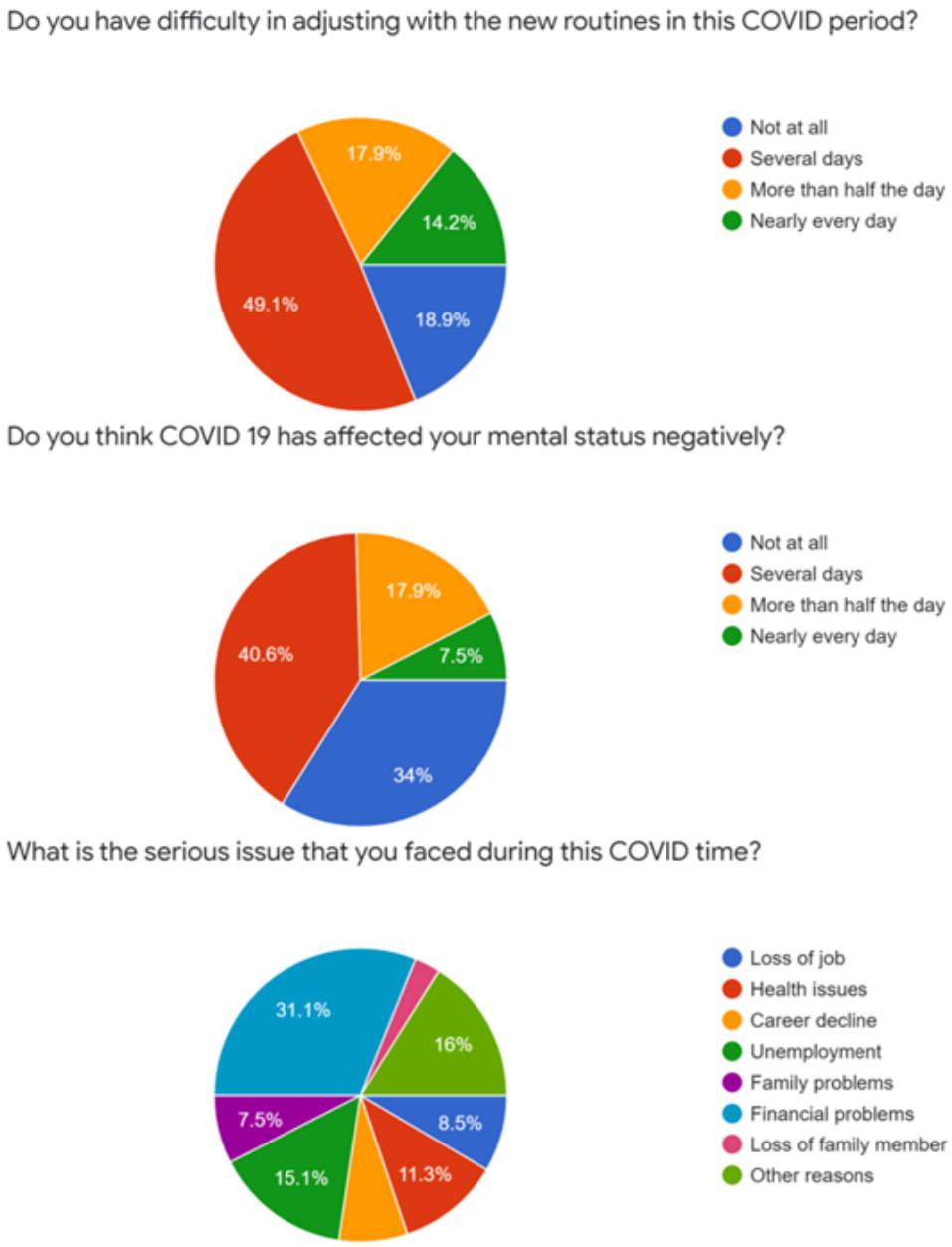

Fig. 6: Patient Health Questionnaire (PHQ-4) among the people in three districts

the participants and the stress, anxiety, and depression level. The Pearson Correlation Coefficient 'r' was used to determine the association between PHQ-4 and PSS-4. A two-tailed p- value of < 0.05 was considered statistically significant.

4. Results

A total of 115 participants (51 Male and 64 Female) filled up the questionnaire, with their Age Group, District, and Employability Status as shown in Table I. Individual mean scores and the percentage of PSS-4 and PHQ-4 among the participants is shown from Figures 1 to Figures 6 and Tables II and III. People living in Kollam showed higher means of PSS and PHQ as 19.3% and 16.1%, respectively, as shown in Figure 7. Males were observed to have consistently less elevated stress levels and mood disorder, depression/anxiety than females (Figure 8). Severity levels of perceived stress and anxiety/ depression among the residents of the three districts is presented in Figure 8 and Table IV. Unemployed and Partially employed people showed a more moderate to severe level of anxiety and depression, while Unemployed and Students showed a more moderate to severe level of stress (Table V and Table VI). There is no significant gender influence in both PSS and PHQ scores (Tables 2 and 3). Uni-variate ordinal

Table IV: PSS and PHQ Scores Among Males and Females in the 3 Districts

Gender	Districts	(N=115)	PSS Score	PHQ Score
Male	Alappuzha	N	16	16
		% of Total N	13.9%	13.9%
	Kollam	N	16	16
		% of Total N	13.9%	13.9%
	Pathanamthitta	N	19	19
		% of Total N	16.5%	16.5%
	Total	N	51	51
		% of Total N	44.3%	44.3%
Female	Alappuzha	N	22	22
		% of Total N	19.1%	19.1%
	Kollam	N	17	17
		% of Total N	14.8%	14.8%
	Pathanamthitta	N	25	25
		% of Total N	21.7%	21.7%
	Total	N	64	64
		% of Total N	55.7%	55.7%
Total	Alappuzha	N	38	38
		% of Total N	33.0%	33.0%
	Kollam	N	33	33
		% of Total N	28.7%	28.7%
	Pathanamthitta	N	44	44
		% of Total N	38.3%	38.3%
	Total	N	115	115
		% of Total N	100.0%	100.0%

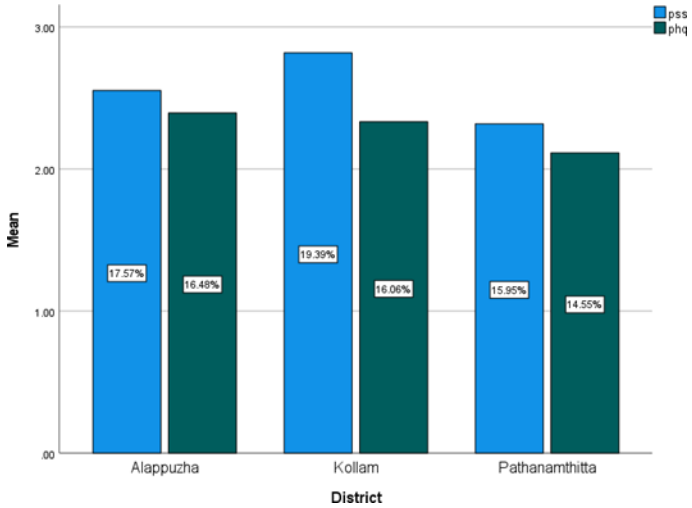

Fig. 7: Prevalence of anxiety and depression among people in the three districts

regression analysis of the severity of PHQ-4 and PSS are reported in Tables V and VI. Gender and the location of the participants are significantly associated with the severity of PHQ-4 and PSS-4. Female participants and Full Time Employed people from Pathanamthitta had higher stress and anxiety/depression scores than males and other districts. This is found to be statistically significant (Tables V and Table VI). There was a strong correlation between PSS scores and PHQ scores both overall (r=0.564) as well as in individual questions (Table VII). A Chi-square test was performed to

PSS SCORE										
Variables	**Normal**		**Mild**		**Moderate**		**Severe**		**TOTAL**	
	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total
GENDER										
Male	10	8.7%	16	13.9%	20	17.4%	5	4.3%	51	44.3%
Female	5	4.3%	19	16.5%	33	28.7%	7	6.1%	64	55.7%
AGE GROUP										
18-25	10	8.7%	16	13.9%	15	13.0%	9	7.8%	50	43.5%
26-35	2	1.7%	9	7.8%	14	12.2%	3	2.6%	28	24.3%

36-45	1	0.9%	3	2.6%	7	6.1%	0	0.0%	11	9.6%
46-65	1	0.9%	2	1.7%	12	10.4%	0	0.0%	15	13.0%
65 and above	1	0.9%	5	4.3%	5	4.3%	0	0.0%	11	9.6%
DISTRICT										
Alappuzha	3	2.6%	16	13.9%	14	12.2%	5	4.3%	38	33.0%
Kollam	1	0.9%	8	7.0%	20	17.4%	4	3.5%	33	28.7%
Pathanamthitta	11	9.6%	11	9.6%	19	16.5%	3	2.6%	44	38.3%
EMPLOYABILITY										
Full time Employed	6	5.2%	11	9.6%	15	13.0%	2	1.7%	34	29.6%
Part time Employed	0	0.0%	2	1.7%	3	2.6%	2	1.7%	7	6.1%
Self Employed	0	0.0%	4	3.5%	13	11.3%	1	0.9%	18	15.7%
Unemployed	2	1.7%	6	5.2%	9	7.8%	3	2.6%	20	17.4%
Student	6	5.2%	8	7.0%	9	7.8%	4	3.5%	27	23.5%
Retired	1	0.9%	4	3.5%	4	3.5%	0	0.0%	9	7.8%

Table V: Socio-Demographic characteristics of participants and the PSS severities

PHQ-4 SCORE										
Variables	**Normal**		**Mild**		**Moderate**		**Severe**		**TOTAL**	
	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total
GENDER										
Male	9	7.8%	30	26.1%	9	7.8%	3	2.6%	51	44.3%
Female	9	7.8%	26	22.6%	24	20.9%	5	4.3%	64	55.7%
AGE GROUP										
18-25	12	10.4%	21	18.3%	13	11.3%	4	3.5%	50	43.5%
26-35	4	3.5%	11	9.6%	10	8.7%	3	2.6%	28	24.3%
36-45	1	0.9%	3	2.6%	6	5.2%	1	0.9%	11	9.6%
46-65	0	0.0%	12	10.4%	3	2.6%	0	0.0%	15	13.0%
65 and above	1	0.9%	9	7.8%	1	0.9%	0	0.0%	11	9.6%
DISTRICT										
Alappuzha	5	4.3%	17	14.8%	12	10.4%	4	3.5%	38	33.0%
Kollam	3	2.6%	17	14.8%	12	10.4%	1	0.9%	33	28.7%
Pathanamthitta	10	8.7%	22	19.1%	9	7.8%	3	2.6%	44	38.3%
EMPLOYABILITY										
Full time Employed	7	6.1%	17	14.8%	8	7.0%	2	1.7%	34	29.6%
Part time Employed	0	0.0%	2	1.7%	3	2.6%	2	1.7%	7	6.1%
Self Employed	0	0.0%	10	8.7%	8	7.0%	0	0.0%	18	15.7%
Unemployed	3	2.6%	8	7.0%	6	5.2%	3	2.6%	20	17.4%
Student	7	6.1%	12	10.4%	7	6.1%	1	0.9%	27	23.5%
Retired	1	0.9%	7	6.1%	1	0.9%	0	0.0%	9	7.8%

Table VI: Socio-demographic characteristics of participants and the PHQ-4 severities

analyze if there was a significant association between Age Group, Gender, District, and Employability vs. Mental Health (PSS and PHQ Score) shown in Table VIII.

5. Discussion

Our study investigates the immediate impact of the COVID-19 pandemic on the general public's mental health and quality of life in three districts of Kerala, i.e., Alappuzha, Pathanamthitta, and Kollam. Since this pandemic is not over yet and is also increasing at a high rate, the pandemic may create immense tension, panic, and anxiety in people living in Kerala because of the alarming rate of COVID-19 cases worldwide. Moreover, the state and central authorities of India had taken preventive measures in the country like imposing strict lock-down laws, social distancing, and restrictions in movement in and out of the city could lead to increased screen- time. Deliberate, constant misinformation about COVID-19 in social media platforms may result in a state of anxiety and panic, often resulting in stress and depression eventually. There is no other way to run away from the COVID-19 pandemic; almost all the countries worldwide have adopted the lock-

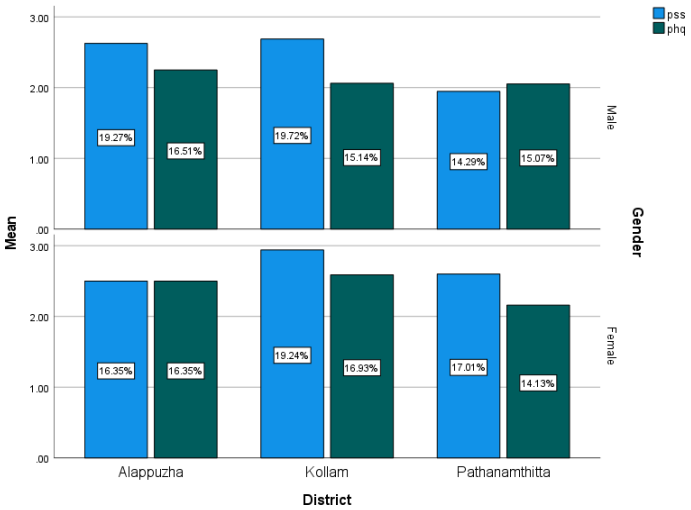

Fig. 8: Perceived stress (PSS) and mental health depression (PHQ) Percentage in males and females of the three districts

Correlation Analysis		
PSS	**PHQ (Total)**	
	Pearson Correlation	*P-value*
PSS-Q1	0.268	0.004
PSS-Q2	0.333	0.000
PSS-Q3	0.258	0.005
PSS-Q4	0.349	0.000
PSS-Q5	0.339	0.000
PSS-Q6	0.386	0.000
PSS-Q7	0.519	0.000
PSS-Q8	0.469	0.000
PSS-Q9	0.563	0.000
PSS-Q10	0.548	0.000
PSS-Q11	0.549	0.000
PSS-Q12	0.459	0.000
PSS-Q13	0.575	0.000
Total PSS	0.564	0.000

Table VII: Correlation analysis between the total scores of PHQ and PSS in the study population.

down technique as a potential primary productive technique to fight against the novel COVID-19. India was also one among many countries to impose lock-down, as soon as the first case was reported and within two weeks when the novel COVID-19 was globally declared as a pandemic, i.e., 25thMarch (on 11thMarch WHO (World Health Organization) announced

Variables	**PSS Score Pearson Chi-Square r- value**	**PHQ Score Pearson Chi-Square r- value**
AGE GROUP	0.037	0.042
GENDER	0.258	0.094
DISTRICT	0.030	0.045
EMPLOYABILITY	0.412	0.123

Table VIII: Chi-Square Test analysis on Age Group, Gender,District and Employability vs Mental Health (PSS and PHQ Score)

COVID-19 as pandemic). Even though this technique is one of the crucial measures to prevent the ride of COVID cases in an exponential manner, it has a widespread effect on the economy, health, and daily living. Based on this, the current study was planned to measure the psychological effect of COVID-19 on the general people living in Alappuzha, Pathanamthitta, and Kollam to assess their perceived stress, depression, and other mental

health.

Our study found a significant relationship between men- tal health and the people living in the three districts (r- value=0.03, 0.045) and mental health and age group (r- value=0.037, 0.042). Also we found out that there is no significant relationship between the mental health and gender (r-value= 0.258, 0.094), and mental health and employability (r-value=0.412, 0.123) as shown in Table VIII. We were able to find that there were 44.35% of Males and 55.65% of Females in the survey and among them 43.50% were aged between 18-25 Years, 26-35 Years aged were found to be 24.30%,36-45 Years aged were 9.60%, 46-65 Years aged were 13.00% and 65 Years and above were 9.6%. People living in Alappuzha 33.04% and Kollam 28.70% were less in number as compared to Pathanamthitta 38.26%. Also, Full time employed people and Students were the ones to share the majority of the Employability Scale as 29.57% and 23.5%, respectively. The fact that nearly 20% of the total population responded that they were previously affected by mental health condition. Roughly three-fourths of the population was not affected by COVID-19, and approximately 8.3% of people were recovering from the disease. The survey showed that 26.4% continuously worry about being affected by COVID-19. 16% of the population indicated that they were stressed before COVID-19, while 27% were stressed right now. Around a quarter of the people showed that they feel hopeless when they think of their future. Another result stated that nearly 38% of the people in Pathanamthitta showed a higher amount of stress and depression, while Kollam showed the least with 28%. But the mean value of PSS and PHQ score of Kollam was the highest among three districts with a mean of 2.55 and with a total of 35.5% as shown in Figure 7. 50% of the population said that they worry too much for several days about their as well as their family's health and safety. The serious issue among the population during the COVID-19 time was that nearly 31% had lost their job, 15% were unemployed, 11% had health issues, and 16% stated other reasons. From Table V, which represented the Socio-Demographic characteristics of participants and the PSS severities, revealed that the female participants showed a bit higher stress PSS score than men. Also, it was seen that the people under the age of 18- 25 had a little more stress than the other category people. People living in Kollam had more stress than the people in the other two districts. From Table VI, which represented the Socio-Demographic characteristics of participants and the PHQ-4 severities, showed that female participants were a bit depressed than the male participants. Here also, the people under 18-25 years were a little bit more depressed than other groups. Kollam and Alappuzha showed higher depression than

Pathanamthitta. Also, unemployed people had more depression than any other category. Also, from Table VII, we could analyze that there is a significant correlation between the questions asked in PSS vs. the questions asked in the PHQ-4. It was found that the males and females are both affected by mental health; therefore, in the case of Gender, we were able to reject the Null Hypothesis, i.e., H1 is significant here. Also, in the case of District, we were also able to find that districts are also affected by mental health, i.e., we could reject the Null Hypothesis, i.e., H_1 is significant here. But in the scenario for Age Group and Employability, we could see no significant relationship between mental health and these variables, i.e., Null Hypothesis is retained here(H_0), as shown in Table VIII. It was learned from the survey that in order to be mentally recharged, 31% chose friends to be a relief while 24% chose family. It was interesting that 11.3% chose spirituality as an option to be mentally refreshed.

6. Conclusion

To conclude, our study was implemented to find any sig- nificant relationship between the people living in the three districts of Kerala (Alappuzha, Pathanamthitta, and Kollam), their Gender, their Age Group, and their employability status versus the Impact of COVID-19 on their mental health. It was found that there was a significant relationship between mental health vs. Age Group and Districts. Participants aged between 18-25 Years were more stressed and depressed than others, and Kollam had more people with stress and depression levels. But there was no significant relationship between Gender and Employability, vs. mental health. Our results and finding suggest an urgent need for expertise and expanding mental health services to everyone, especially the people aged between 18-25 years and the residents of Kollam, during this pandemic..

References

1. Z. Li, J. Ge, M. Yang, J. Feng, M. Qiao, R. Jiang, J. Bi, G. Zhan, X. Xu,
2. L. Wang et al., "Vicarious traumatization in the general public, members, and non-members of medical teams aiding in covid-19 control," Brain, behavior, and immunity, vol. 88, pp. 916–919, 2020.
3. D. Roy, S. Tripathy, S. K. Kar, N. Sharma, S. K. Verma, and V. Kaushal, "Study of knowledge, attitude, anxiety & perceived mental healthcare need in indian population during covid-19 pandemic," Asian journal of psychiatry, vol. 51, p. 102083, 2020.

4. W. Shi and B. J. Hall, "What can we do for people exposed to multiple traumatic events during the coronavirus pandemic?" Asian journal of psychiatry, 2020.
5. [4] J. Qiu, B. Shen, M. Zhao, Z. Wang, B. Xie, and Y. Xu, "A nationwide survey of psychological distress among chinese people in the covid-19 epidemic: implications and policy recommendations," General psychia- try, vol. 33, no. 2, 2020.
6. Y. Krishnamoorthy, R. Nagarajan, G. K. Saya, and V. Menon, "Preva- lence of psychological morbidities among general population, healthcare workers and covid-19 patients amidst the covid-19 pandemic: A system- atic review and meta-analysis," Psychiatry research, vol. 293, p. 113382, 2020.
7. S. Grover, S. Sahoo, A. Mehra, A. Avasthi, A. Tripathi, A. Subramanyan,
8. Pattojoshi, G. P. Rao, G. Saha, K. Mishra et al., "Psychological impact of covid-19 lockdown: An online survey from india," Indian Journal of Psychiatry, vol. 62, no. 4, p. 354, 2020.
9. S. Cohen, T. Kamarck, and R. Mermelstein, "A global measure of perceived stress," Journal of health and social behavior, pp. 385–396, 1983
10. K. A. Leon, A. D. Hyre, D. Ompad, K. B. DeSalvo, and P. Muntner, "Perceived stress among a workforce 6 months following hurricane katrina," Social psychiatry and psychiatric epidemiology, vol. 42, no. 12, pp. 1005–1011, 2007.
11. D. G. Cruess, M. H. Antoni, M. Kumar, G. Ironson, P. McCabe, J. B. Fernandez, M. Fletcher, and N. Schneiderman, "5cognitive-behavioral stress management buffers decreases in dehydroepiandrosterone sulfate (dhea-s) and increases in the cortisol/dhea-s ratio and reduces mood disturbance and perceived stress among hiv-seropositive men," Psy- choneuroendocrinology, vol. 24, no. 5, pp. 537–549, 1999.
12. K. Hölzel, J. Carmody, K. C. Evans, E. A. Hoge, J. A. Dusek,
13. L. Morgan, R. K. Pitman, and S. W. Lazar, "Stress reduction correlates with structural changes in the amygdala," Social cognitive and affective neuroscience, vol. 5, no. 1, pp. 11–17, 2010.
14. J. D. Lane, J. E. Seskevich, and C. F. Pieper, "Brief meditation training can improve perceived stress and negative mood," Alternative Therapies in Health and Medicine, vol. 13, no. 1, pp. 38–45, 2007.
15. M. T. Marcus, P. M. Fine, F. G. Moeller, M. M. Khan, K. Pitts, P. R. Swank, and P. Liehr, "Change in stress levels following mindfulness- based stress reduction in a therapeutic community," Addictive Disorders & Their Treatment, vol. 2, no. 3, pp. 63–68, 2003.
16. J. F. Culhane, V. Rauh, K. F. McCollum, V. K. Hogan, K. Agnew, and
17. P. D. Wadhwa, "Maternal stress is associated with bacterial vaginosis in human pregnancy," Maternal and child health journal, vol. 5, no. 2, pp. 127–134, 2001.
18. Garg, M.-M. Chren, L. P. Sands, M. S. Matsui, K. D. Marenus,
19. K. R. Feingold, and P. M. Elias, "Psychological stress perturbs epidermal permeability barrier homeostasis: implications for the pathogenesis of stress-associated skin disorders," Archives of dermatology, vol. 137, no. 1, pp. 53–59, 2001.
20. J. R. Kramer, J. Ledolter, G. N. Manos, and M. L. Bayless, "Stress and metabolic control in diabetes mellitus: methodological issues and an illustrative analysis," Annals of Behavioral Medicine, vol. 22, no. 1, pp. 17–28, 2000.
21. K. Kroenke, R. L. Spitzer, J. B. Williams, and B. Löwe, "An ultra-brief screening scale for anxiety and depression: the phq–4," Psychosomatics, vol. 50, no. 6, pp. 613–621, 2009.
22. Löwe, I. Wahl, M. Rose, C. Spitzer, H. Glaesmer, K. Wingenfeld,
23. Schneider, and E. Brähler, "A 4-item measure of depression and anx- iety: validation and standardization of the patient health questionnaire-4 (phq-4) in the general population," Journal of affective disorders, vol. 122, no. 1-2, pp. 86–95, 2010