Original Article

COVID - 19 pandemic and perceived stress in Information Technology professionals

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ABSTRACT

Introduction: Novel coronavirus disease (COVID-19), a pandemic was declared by WHO on 11 March 2020. The lockdown had an evident impact on various sectors including the Information Technology sector. Few studies have been conducted to find out the levels of stress in Information Technology professionals. During the COVID-19 pandemic, all employees of Information Technology companies were informed to work remotely at their homes without any prior information, training and mental acceptance i.e. 'work from home'. Information technology professionals have occupational stress &working from home during COVID-19 had added mental stress. The present study was planned to assess the impact of the COVID-19 pandemic on perceived stress in Information Technology professionals.

Methods: Present study was a cross-sectional observational study. Volunteers of the Information Technology sector (n=200) of either sex in the age group of 25 to 55 years participated in the study. PSS was administered through Google Forms and scores were analyzed.

Results: Association of various stressors with PSS was done which showed a significantly positive association. The mean PSS score of subjects was 23.53 ± 7.39. Twelve (6%) employees had mild, one hundred twenty (60%) had moderate and sixty-eight (34%) had high stress levels. This study explored that IT professionals experienced an   additional level of stress during the COVID-19 pandemic.

Conclusion: The present study concluded statistically significant moderate levels of stress in IT professionals of either sex with the outbreak of (COVID-19) pandemic.

Keywords: COVID-19, Information technology, Perceived Stress Scale, Stress.

Introduction

Novel coronavirus disease (COVID-19), a pandemic was declared by WHO on 11 March 2020.[1] Pandemic is an epidemic occurring worldwide, crossing international boundaries, and usually affecting a large number of the population.[2]

The Government had enforced lockdown, quarantine, and social distancing measures to prevent and slow down the spread of the virus from person to person.[3] The lockdown had an evident impact on various sectors including the Information Technology sector which collectively employs approximately 4 million people. All employees of Information Technology companies were informed to start 'work from home' meaning working remotely at their homes without any

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prior information, training, and mental acceptance.[4,5]

Stress refers to a perceived or actual threat to physical and or psychological homeostasis of the human body causing activation of the hypothalamus – Pituitary - Adrenal axis.[6] Studies have shown that epidemics like SARS have created stress among the general population and patients.[7] The worldwide COVID-19 Pandemic was also posing a drastic effect on individual mental as well as physical health. The increasing number of cases & high mortality led to anxiety and depression globally.[4]

There are various methods to estimate levels of stress. Perceived Stress Scale, is a prevalidated questionnaire that measures the degree to which situations in one's life are perceived as stressful in the last one month.[6]

Studies have also shown that Information technology professionals have occupational stress like lack of advancement of career, high workload, risk involved in decision making and expectation from job, etc.[7,8]

During the COVID-19 pandemic, many employees of the Information technology sector started work from home, on short notice and without pre-preparation and proper setup. They also faced difficulties coping with their work timing, looking after kids and their online classes.[4]

Female information technology employees had faced added difficulties in dealing with household chores without domestic help, while others faced difficulty in accessing the internet. Adding more to these challenges, the employees had difficulties in attending online meetings and concentrating on work due to small houses thus lacking privacy and fear of losing their job.[4]

Few studies have been conducted to find out the Perceived stress level in Information Technology professionals during the COVID-19 pandemic.[8,9,10]

So the present study was planned to assess the impact of the COVID-19 pandemic on perceived stress in Information Technology professionals.

Methods

The present study was a cross-sectional study which is a type of observational study design. In this study outcome & exposure were measured at the same time by observation without any intervention. Volunteers of the Information Technology sector (n=200) of either sex in the age group of 25 to 55 years participated in the study. Purposive sampling was used to select information technology professionals of Pune city. The sample size estimation was done using the results of a study done by Sherrill W. Hayes et al.[5] Standard deviation of the perceived stress scale was 5.49 considering the allowable error equal to 0.8 and 5% level of significance, sample size was calculated to be 200.

The study was approved by the Institutional ethical committee. Online informed consent was obtained from subjects. The study was conducted online in July 2020 in Pune. A Google form including multiple choice questions of perceived stress score & other questions like working hours, disturbed sleep, household work affected due to working from home, fear of losing the job, impact of social media, kids online classes, sedentary lifestyle due to less time for exercise, food craving, mood swings & poor internet connectivity was designed. The Google form was shared in June 2020 and 3 days were given to fill in the answers and submit the form.

Subjects suffering from adrenal disease, anxiety disorder and those having a history of taking medication e.g antidepressants, hormonal therapy and steroids were excluded from the study.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument and the most widely used psychological instrument for measuring the perception of stress.[11] It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap into how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least a junior high school education. The items are easy to

understand, and the response alternatives are simple to grasp.

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group.

PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A short 4-item scale can be made from questions 2, 4, 5 and 10 of the PSS 10-item scale.

> 0 = Never
>
> 1 = Almost Never
>
> 2 = Sometimes
>
> 3 = Fairly Often
>
> 4 = Very Often

Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.[11] Scores ranging from 0 to 13 - Low stress, 14 to 26 - moderate stress, and from 27 to 40 - high perceived stress.

Data analysis was done by SPSS (Statistical Package for Social Sciences) version 28.0. The data was expressed as mean ± standard deviation. Data was analyzed in percentage (%) for multiple-choice questions and the PSS questionnaire. The association of various stressors with PSS score was analyzed and p-value <0.05 means that the value was statistically significant.

Results

200 subjects of either sex in the age group of 25-55 years participated in the study. Out of 200 subjects, 115 (57.5%) subjects were male and 85 (42.5%) subjects were female. The mean PSS score of subjects was 23.53 ± 7.39. The mean PSS score of male was 23.13 ± 7.41 and female was 24.07 ± 7.33.

Out of 200 subjects, 12 (6%) had mild stress, 120 (60%) had moderate levels of stress and 68 (34%) had high stress levels (Figure 1).
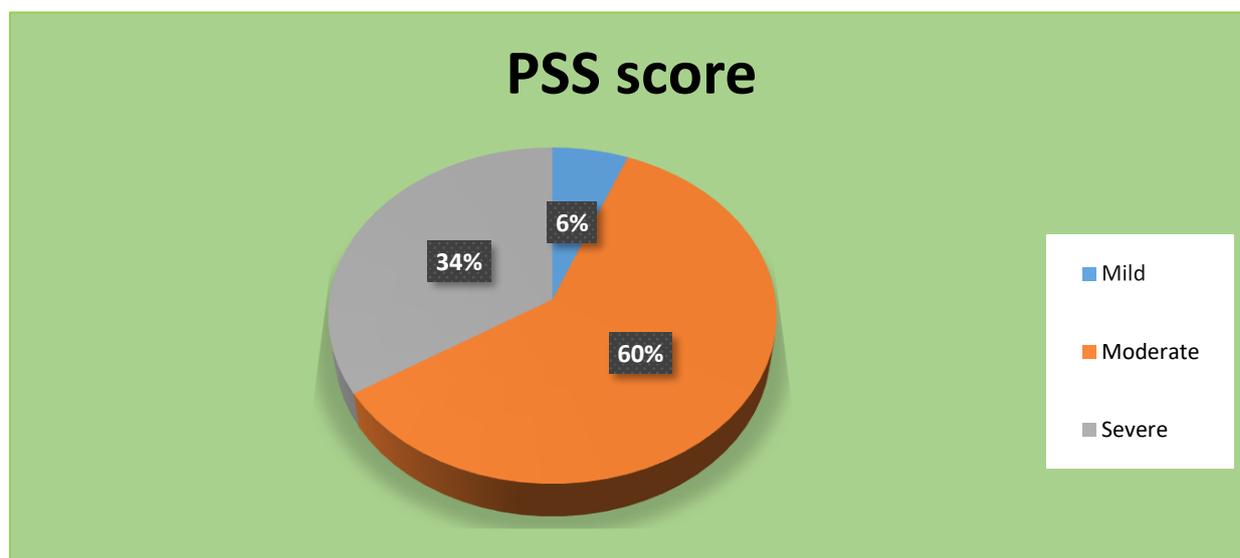

Figure 1: The stress levels in the subjects as assessed by Perceived stress scale
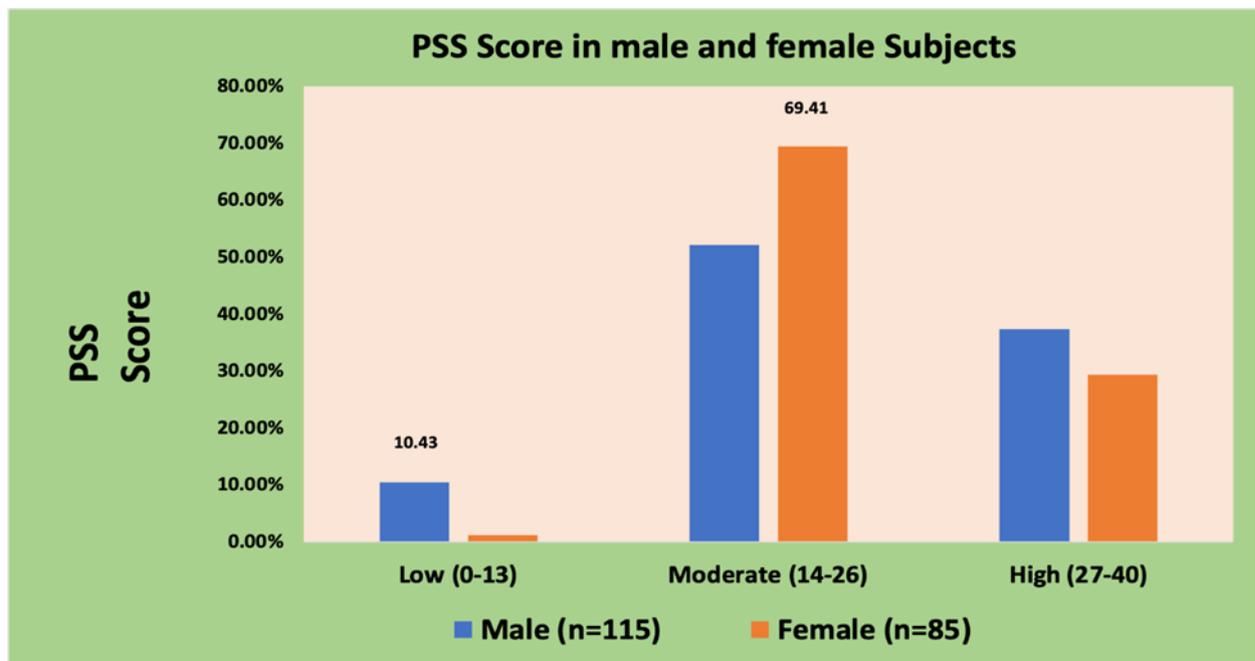
Figure 2:, PSS score in male and female subjects

The important stressors found in our study were prolonged working hours, disturbed sleep, difficulties dealing with the household chores without domestic help, fear of losing the job, kid's online classes, negative news propagated on news channels & social media, poor internet connectivity, food craving, mood swings, excess workload, sedentary lifestyle due to less time for exercise, job pressure and COVID-19 phobia (Table 1).

Out of 200 subjects, 53.5% were stressed due to prolonged working hours of more than 10 hours

daily and 78% of subjects reported that they are having disturbed sleep. In 73.5% of subjects, household work was affected and 67.5% of subjects were having fear of losing job. In 80% of subjects, the impact of social media was the main stressor and in 59.5% of subjects, managing kid's online classes along with working from home was causing stress. 56.5% of subjects reported that the pandemic had a negative impact on their lives.

The results also showed that most of the subjects experienced moderate levels of stress during the last one month (Table 2).

Table 1: Association of various stressors amongst IT professionals with the level of stress (PSS score).

Stressors amongst IT Professionals		PSS score			Total	Chi-square value	p-value
Items causing stress		Low	Moderate	High			
Working hour	6-8 hours	9	20	0	29	52.08	<0.001*
	8-10 hours	2	43	19	64		
	>10 hours	1	57	49	107		
Disturbed sleep	Yes	26	76	54	156	49.94	<0.001*
	No	30	14	0	44		
Household work affected due to work from home	Yes	34	78	35	147	30.59	<0.001*
	No	33	19	1	53		
Fear of losing a job	Yes	10	62	63	135	59.3	<0.001*
	No	27	38	0	65		

Impact of social media	Yes	40	56	64	160	23.7	<0.001*
	No	18	22	0	40		
Kids online classes	Yes	1	87	32	120	54.71	<0.001*
	No	26	53	1	80		
Sedentary lifestyle due to less time for exercise	Yes	33	53	5	91	6.77	0.034
	No	48	61	0	109		
Food craving	Yes	32	44	0	76	0.62	0.74
	No	52	71	1	124		
Mood swings	Yes	29	36	2	67	0.42	0.81
	No	61	72	4	133		
Poor internet connectivity	Yes	20	40	1	61	3.99	0.14

P < 0.001 – Highly significant

P >0.05 – Not significant

Table 2: Responses to PSS questionnaire:

S. N	Questions	Never n=200 (%)	Almost Never N=200 (%)	Sometimes N=200 (%)	Fairly often N=200 (%)	Very often N=200 (%)
1	upset because of something that happened unexpectedly	15 (7.5%)	12 (6%)	116 (58%)	51 (25.5%)	6 (3%)
2	unable to control the important things in your life	11 (5.5%)	27 (13.5%)	99 (49.5%)	42 (21%)	21 (10.5%)
3	felt nervous and "stressed"	8 (4%)	13(6.5%)	122(61%)	43(21.5%)	14 (7%)
4	felt confident about ability to handle personal problems	34(17%)	81(41%)	70(35.5%)	9(4.5%)	6(3%)
5	things were going on way	28 (14%)	63 (31.5%)	97 (48.5%)	7 (3.5%)	5 (2.5%)
6	could not cope with all the things	5 (2.5%)	12 (6%)	127 (63.5%)	36 (18%)	20 (10%)
7	able to control irritations in the life	23(11.5%)	58 (29%)	108 (54%)	5 (2.5%)	6 (3%)
8	were on top of things	24 (12%)	33 (16.5%)	126 (63%)	10 (5%)	7 (3.5%)
9	angered because of things that were outside of control	3 (1.5%)	18 (9%)	109 (54.5%)	47 (23.5%)	23 (11.5%)
10	difficulties were piling up so high that could not overcome	9 (4.5%)	33 (16.5%)	95 (47.5%)	54 (27%)	9 (4.5%)

Discussion

This study highlighted the level of stress and various stressors faced by IT professionals of either sex on day-to-day basis with the outbreak of (COVID-19) pandemic.

The present study showed statistically significant moderate levels of stress in IT professionals of either sex as shown in figure no. 1, however, the result showed that the level of stress in females (figure no. 2) was more than in males. Similar results were found in a study conducted by Riba Maria et al.[9] A sudden change in the mode of work, from office setups to working from home led to difficulty in coping with office work and household chores.[5] Adding to their difficulties, fear of losing job, and managing kids' online classes may be a factor causing anxiousness in these professionals. Staying indoors led to an increase in the usage of social & digital media platforms, propagating fear of the COVID-19 pandemic amongst the population. Many studies have also documented the same results.[4,9,10]

Our study showed a significant positive association between various stressors with perceived stress. In our study, 80% of subjects reported a negative impact of social media on their mental health status. Similar results were shown in various studies which highlighted the mental health issues among male & female employees who were experiencing feelings of distress.[12,13] The Present study showed a significant positive association of prolonged working hours with perceived stress. 53.5% of professionals who were working for more than 10 hours daily showed moderate to high levels stress. Similar results were shown in a study conducted by S. Karthikeyan Arasu et al who documented that 56% of IT professionals who were working for more than 8 hours suffered from a moderate level of stress.[8]

In our study, 67.5% of subjects had a fear of losing job. A study done by Khudaykulov A et al. also reported that the pandemic led to job insecurity in subjects.[14] In this study, 54.5% of volunteers got angry sometimes and 35% of volunteers got angry often. A study done by Smith et al, documented that anger was associated with younger age and

an increased likelihood of facing significant financial difficulties.[15]

Our study found that 73.5% of subjects felt stressed due to household work getting affected by "work from home". Similar results were found in a study conducted by Jelena Lonska et al.[16] 59.5% of subjects showed a positive association of perceived stress with kids' online classes. The result is similar to a study conducted by Priyanka Harjule et al.[17] Present study documented that 52.5% of subjects felt stressed due to an inactive lifestyle as also highlighted in a study done by Ruberti OM et al.[18]

In our study few subjects also experienced that food cravings, mood swings and internet connectivity problems resulted in creating a lot of mental stress but there was no significant association of these stressors with perceived stress.

The work pattern was unstructured unlike the pre-Covid times affecting the mental health of many subjects.[16] Study done by S. Karthikeyan Arasu et al highlighted that IT professionals face stress, anxiety and depression due to exposure to many stressors in the workplace.[8] Studies have shown similar results emphasizing overall decreased work capability, productivity and performance in IT professionals.[18]

The probable mechanism that explains the cause of mental stress in volunteers is a complex relationship between mental stress & Hypothalamo Pituitary Adrenal (HPA) system. The stressors initiate the stress response of the sympathetic nervous system. Psychological stressors increase glucocorticoid levels through increased adrenal activity by activating the HPA axis which inhibits the functions of lymphocytes, macrophages, and monocytes, leading to decreased immunity and thereby increasing the susceptibility to infection leading to poor work performance, decreased concentration and overall work efficiency.[6]

Conclusions

The present study concluded statistically significant moderate levels of stress in IT

professionals of either sex with the outbreak of (COVID-19) pandemic.

Our findings have key implications for organizations and their leaders who need to revisit work-from-home policies for the future workforce. India is one of the leading hubs of Information technology, employing lakhs of people. Thus there is a need to work on minimizing the stressors at the workplace as well as the work-from-home setup & work policies for better physical & mental health of their

professionals. Providing a conducive environment for work can help in better work performance & productivity. We highlight our theoretical contributions and outline the scope for future research.

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