Original Research Article

Assessment of Depression, Anxiety and Stress among Computer Aided Design Engineers Working in a Multinational Company in Chennai, Tamilnadu

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Abstract

Depression, anxiety and stress play a significant role in mental wellbeing of an individual. People with depression tend to suffer with anxiety, where as it can in-turn lead to more stress and dysfunction in working environment. This study aims to find out the prevalence of Depression, Anxiety and Stress among the Computer aided design engineers and to assess the factors affecting them. A cross sectional study was conducted using Depression Anxiety Stress Scale (DASS) to assess the level of Depression and Anxiety among the computer aided design engineers in a multinational private software company in Chennai, Tamil Nadu. A total of 309 engineers participated in the study. A pre-tested questionnaire consisting of socio-demographic variables and questions related to depression, anxiety and stress was administered. Data obtained were collected and analyzed statistically by simple proportions and chi-square test.

The Prevalence of Depression, Anxiety and Stress among the study participants were 42.7%, 48.2% and 19.1% respectively. The factors associated with them were number of working days in a week, not spending enough time with the family and absence of savings or investments. Highly significant association was noted between Depression levels, anxiety and stress. The Prevalence of Depression and Anxiety was high among the Computer aided design engineers. This study is an early attempt at exploring the various factors which can affect the morbidity conditions among them.

Keywords: Prevalence, Depression, Tamil Nadu, Chennai, Urban

Introduction

Health is a state of complete physical, mental and social wellbeing and not merely the absence of the disease or infirmity[1] The ability to respond to variety of experiences in life with a sense of purpose, the quality of interrelations with the other members of the

society makes for a positive outlook in an individual. [2]

Depression, anxiety and stress play a significant part of mental wellbeing in an individual. In depression, a person is characterised by reduced mood, energy, loss of interest and enjoyment. It still is a leading cause of disability in the world with more than 280 million people of all ages affected. Its lifetime estimates is nearly 3.8%[3,4]. Anxiety on the other hand is characterised by overly apprehensive expectation, where a person has a difficulty in controlling his worry. Worldwide prevalence of anxiety is 3.6% as of 2015. [4] Stress on the other hand, is a response presented as a result of work pressures and demands which are challenging than a person's ability to cope**.** [5]

People with depression tend to suffer with anxiety and its related symptoms, where as it can in-turn lead to more stress and dysfunction at work places, This interrelation between depression, anxiety and stress can be affected by factors like work organisation, poor management, working conditions and lack of support at work places[3]The jobs of engineers are more competitive and stressful since they are put forth with night shifts, target achievements and more importantly night shifts. There is requirement of proper interaction with clients and insight into technical innovations since software development is a learning and communication process. These situations creates pressure on IT professionals affecting their mental health. Hence there is a need to explore the mental well being of the IT professionals and its associated factors.

Also software development process is a learning and communication process requiring greater interaction with the clients, deep understanding of the business process, and insight into technological innovations. These situations puts pressure on the professionals resulting in professional

stress.This study was undertaken to find out the extent of the Depression, Anxiety and Stress among the computer aided design Engineers residing in Chennai, Tamil nadu.

Objectives

1. To find out the prevalence of Depression, Anxiety and Stress among the Computer aided design engineers.
2. To assess the factors associated with them.

Materials and Methodology

Study setting - A Community based cross-sectional study done at a Private Multinational Company at Chennai, Tamil Nadu. This study was conducted over a period of 3 months from January 2021 to March 2021. The study subjects comprised of all the Computer Aided Designing (CAD) engineers.

Sample size- Universal sampling was done in the company to include as many participants into the study as possible. A total of (N= 309) computer aided design engineers took part in the study.

Sampling method and Data collection- After obtaining clearance from the Institutional Ethical Committee, permission was taken from authorities. All the eligible employees were explained about the study and consent was taken. Those employees who didn't give their consent for the participation were excluded from this study. The standard DASS 21 questionnaire was used to access the stress anxiety and depression levels of the employees and some additional questions about the individual's social life, family and occupational burden were included in a separate section in the questionnaire. The study questionnaire was sent to the participants as a Google form through the email, enabling them to answer it in their personal devices themselves and the responses were recorded. The responses and results were not revealed to the participants

or the company and were maintained with utmost confidentiality. Data was analysed by calculating Percentages and Proportions and was presented in suitable tabular and graphical forms. Data was entered into Microsoft Excel sheet and analysed using Epi Info version 7.

Results

Majority of the participants were males 246 (79.6%), were married 197(63.8%), belonged to nuclear type of family 243(78.6%) and had Bachelor's degree in engineering 228(73.8%). Most of the participants were of the age groups 21-30 yrs 128(41.4%) and 31-40 yrs 112(36.2%) respectively. (Table-1) Nearly 271(87.7%) of the participants work for 5 days in a week and have 9 hours shift during working days with an hour of break in between. Most of the participants 177(57.3%) had some or other forms of savings from their earnings and 231(74.8%) had debts/ loans. Nearly half of the participants 170(55%) agreed to have been spending enough time with their families.

Difficulty in doing things 43(13.9%), having no enthusiasm 33(10.6%) and no positive feeling 37(11.9%) were frequently noted among questions related to depression. Similarly, dryness of mouth 53(17.1%), worrying about making themselves a fool 39(12.6%) were reported the most among questions related to anxiety. On being asked about their stress at workplace, Nearly 54(17.4%) of the participants had trouble in winding down and agreed to have over reacted to things, with 35(11.3%) stating about difficulty in relaxing.

The prevalence of depression was 42.7%, with moderate and severe depression comprising of 22.3% and 6.8% respectively. It was nearly three times higher among men (32.7%) compared to women (10%). Similarly for Anxiety, the overall prevalence was 48.2%. The prevalence of moderate and severe anxiety was 26.9% and 15.2% respectively with higher prevalence noted in men (37.2%) than women (11%). The prevalence of stress was 19.6%. The prevalence of stress among males was 15.9% and among females it was 3.2% (Table-2)

The mean Depression scores and the mean anxiety scores were statistically high among those who worked even during weekends (6 days work), who did not had any investments or savings and among those who expressed to not have spent enough time with their family. Other factors like gender, marital status and type of family were not found to be statistically significant. (Table-3 & 4)

The mean scores of stress were found to be statistically higher among the participants who have not spent enough time with their families (13.89±7.94 vs 5.51±6.61)(p<0.0001)*. Other factors like gender, type of family, savings, number of working days.There is strong positive correlation between all the scores of depression, anxiety and stress among the study subjects which showed all these are interrelated (Fig1,2, 3).

Table 1: Demographic characteristics of study participants (N=309)

Characteristics	Group	n (%)
Gender	Male	246 (79.6)
	Female	63 (20.4)
Marital status	Married	197 (63.8)
	Unmarried	112 (36.2)
Type of family	Nuclear	243 (78.6)
	Joint	66 (21.4)
Age group	21-30	128 (41.4)
	31-40	112 (36.2)

| | 41-50 | 57 (18.4) |
| | 51-60 | 12 (3.9) |

Table 2: Prevalence of Depression, Anxiety and Stress

Characteristic	Categories	Males	Females	Total n(%)
Depression	Absent	145(46.9)	32(10.4)	177 (57.3)
	Mild	30(9.7)	12(3.9)	42 (13.6)
	Moderate	55(17.8)	14(4.5)	69 (22.3)
	Severe	16(5.2)	5(1.6)	21 (6.8)
Anxiety	Absent	131(42.4)	29(9.4)	160 (51.8)
	Mild	17(5.5)	2(0.6)	19 (6.1)
	Moderate	60(19.4)	23(7.4)	83 (26.9)
	Severe	38(12.3)	9(2.9)	47 (15.2)
Stress	Absent	197(63.8)	53(17.2)	250 (80.9)
	Mild	23(7.4)	4(1.3)	27 (8.7)
	Moderate	15(4.9)	3(1)	18 (5.8)
	Severe	11(3.6)	3(1)	14 (4.6)

Table 3: Factors affecting the Depression scores

Factors	Categories	Mean ± SD	T value	95% CI	p Value
Gender	Males	7.95± 8.21	0.56	-3.04 - 1.68	0.57
	Females	8.63±9.57			
Marital status	Married	8.03±7.76	0.16	-2.1 - 1.81	0.86
	Unmarried	8.19±9.69			
Type of Family	Nuclear	8.36±8.51	1.07	-1.04 - 3.59	0.28
	Joint	7.09±8.4			
Working days	6 days	11.52±11.1	2.68	1.04- 6.78	0.008*
	5 days	7.6±7.97			
Savings	Yes	6.55±8.07	-3.75	-5.48 - -1.71	<0.0001*
	No	10.15±8.64			
Family time	Yes	4.78±7.1	8.35	-9.07- - 5.61	<0.0001*
	No	12.12±8.3			

Table 4: Factors affecting Anxiety scores

| Factors	Categories	Mean ± SD	T value	95% CI	p value
Gender	Males	7.88±8.03	0.75	-1.35- 3.03	0.45
	Females	8.73±7.35			
Marital status	Married	8.33±7.77	0.81	-1.07- 2.6	0.41
	Unmarried	7.57±8.12			
Type of Family	Nuclear	8.44±7.85	1.65	0.34- 3.95	0.09
	Joint	6.63±7.94			
Working days	6 days	10.63±8.58	2.15	1.25- 5.6	0.032*
	5 days	7.69±7.74			
Savings	Yes	6.83±7.71	3.19	1.1- 4.62	0.002*
	No	9.69±7.86			
Family time	Yes	4.62±6.39	9.36	6.07-9.19	<0.0001*
	No	12.25±7.53			
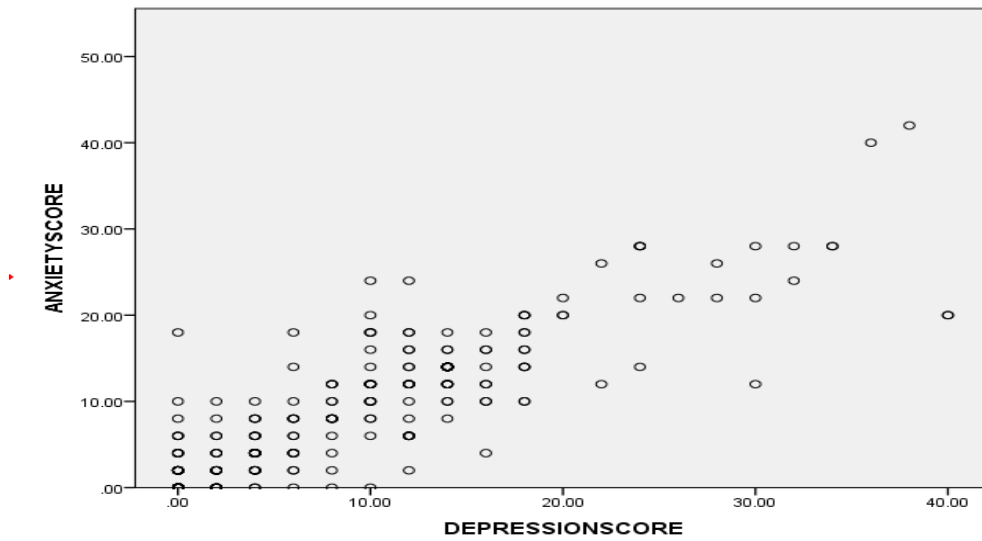
Figure 1: Co-relation between depression and anxiety scores of study subjects (N-300)
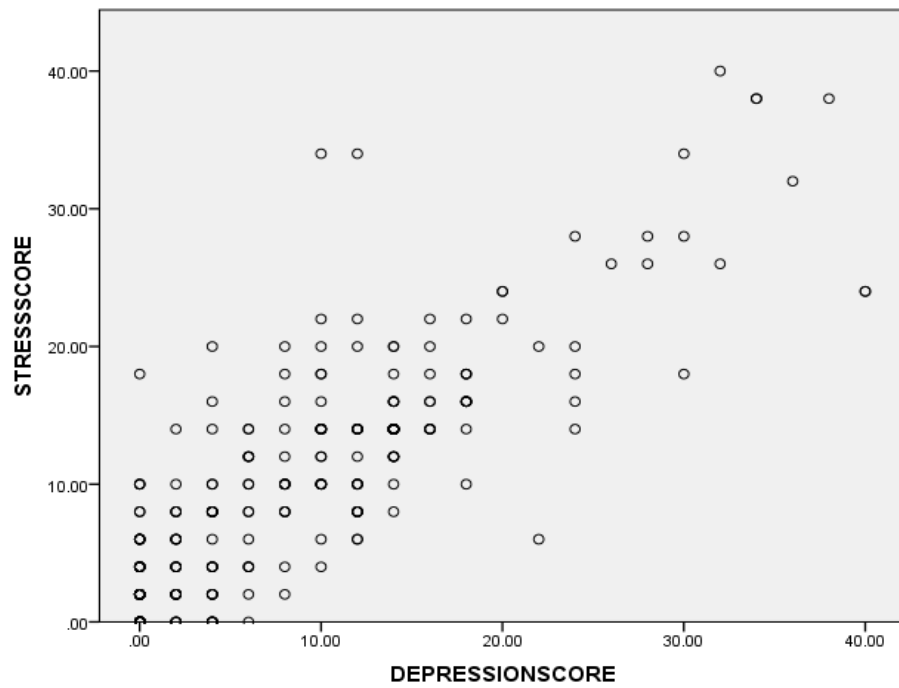(Correlation coefficient r=0.879, p-<0.01)

Figure 2: Co-relation between depression and stress scores of study subjects (N-300)
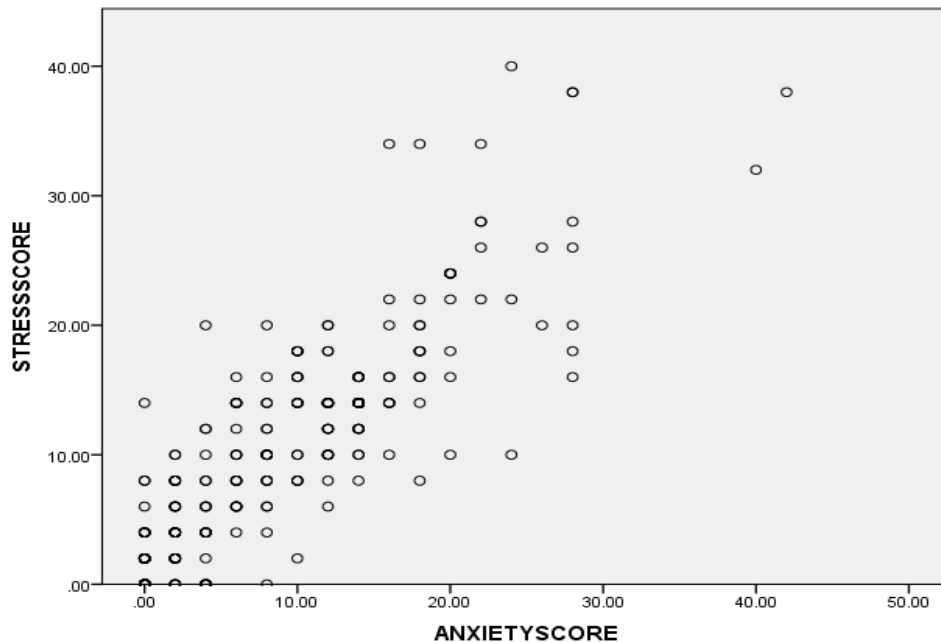(Corelation co-efficient r=0.852, p=<0.001)

Figure 3: Co-relation between anxiety and stress scores of study subjects (N-300)
((Corelation co-efficient r=0.873, p=<0.001)

Discussion

In our study sample males were more in number than females. The gender difference may be largely due to cultural and social influences and additional responsibilities in woman's life might have led them to opt for professions which are less time consuming and less stressful unlike software profession. [6]

The overall prevalence of depression was found to be 42.7%, which is quite high when compared to the life time prevalence of depression among general population of 5.2% and even prevalence in clinical settings at 20%.[7] Whereas a similar studies done among IT professionals at Mysore found the prevalence to be at 43.4%[8] which is very similar to our study findings. There is a contrary finding in a study conducted among software professionals in Delhi where the depression was reported to be only 6-8%, this difference in findings are found to be different study tool used.[14] The depression scores were higher among females than males, but the prevalence was nearly 3 times

higher among males than females (32.7% vs. 10%) this can be due to the less number of female participants in the present study. The overall prevalence of anxiety was 48.2%. The findings are considerably higher than general population which is at 3.6% [4].The prevalence was 37.2% among males compared to females at 11% due to the less number of female participants. [9-11]The present study found that the overall prevalence of stress at 19.1%, the prevalence of stress among males was 15.9% compared to females at 3.2%, which is considerably low compared to other studies in similar settings.

In a study conducted at Mysore on IT professionals the prevalence was found to be at 51.2% [8], similarly a study conducted in Telangana state among software professionals nearly 50% of the study participants were in stress. [11,12] In a similar study conducted among IT professional in Chennai, Tamil nadu reported 38%. Stress is a negative consequence of modern living. People are stressed due to

over work, job insecurity, information overload and increasing pace of life especially considering the IT industries. [6]

The scores of depression, anxiety and stress significantly associated with the number of working days in a week. These findings are supported by P Afonso *et al* conducted among general population which showed significant impact of working hours on domains of mental healIth.[15]In the current study, domains of depression, anxiety and stress was significantly associated with those having loans or debts which are supported by studies conducted in general population where the income plays a role in the risk of mental illness. Also the present study showed significant association of depression, anxiety and stress with those spending less time with family members.[16-18]This finding is similar to a study conducted by Hakiminya B *et al* which showed decreased prevalence of depression and social behaviour disorder among the general population spending less time with family members.[19]

The correlation between Depression, Anxiety and Stress were found to be highly significant. It further reinforces that the people with depression tends to suffer with anxiety symptoms. Whereas depression could in-turn independently lead to stress and dysfunction at workplace. [5]

Conclusions

The Depression, Anxiety prevalence among the computer design engineers was quite high and there is a need to address this at all the levels of the industries to improve the health and productivity. Number of working days, spending time with one's family and maintaining a work balance will always lead to better health. Their early assessment can lead to early intervention and to take necessary action in time to prevent development of severe form of these diseases at work place.

Limitations

Since a screening questionnaire was used to detect the levels of depression, anxiety and stress, there can be bit of bias in self reporting. Many of these outcomes are multi-factorial in nature, so all other triggering factors also need be studied.

Ethical Clearance

Ethical Clearance was obtained from the Institutional Review Board, Saveetha Medical College and Hospital, Thandalam, Chennai.

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