

Mental Well-Being of Information Technology Professionals Working in India

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ABSTRACT

Background: Technology industry has seen significant growth in India, spurring an economic boom and significant cultural changes. These cultural and economic shifts may in part be responsible for increased job demands and social pressures for IT workers. Thus, there is a need to understand the mental well-being of individuals within the Indian technology sector. Understanding the prevalence of stress, anxiety, and depression can aid in raising awareness and providing targeted interventions.

Methodology: In this study, Indian IT professionals (N = 896) recruited from email lists, direct distributions, and other sources completed an online survey that included depression (Patient Health Questionnaire - 9), stress (Perceived Stress Scale-10), anxiety (Generalized Anxiety Disorder Scale-7), and interpersonal difficulties screeners.

Results: One quarter of participants reported moderate to severe stress, anxiety, depression and interpersonal difficulties. No gender or age differences was found in prevalence of depression or anxiety. Living in cities was associated with higher anxiety than living in small towns (27.1% vs. 17.0%; $p=0.001$); conversely, living in smaller towns was associated with higher interpersonal difficulties compared to large cities (33.8% vs. 7.8%; $p<0.001$). IT population appear to be at a higher risk of mental health challenges than the reported averages within India.

Conclusion: The results suggest a need to build awareness of these issues within this population and to work to ameliorate them through interventions appropriate for this population.

Keywords: Depression, Anxiety, Stress, India, Information Technology

(Paper received – 23rd October 2020, Peer review completed – 5th December 2020)

(Accepted – 18th December 2020)

INTRODUCTION

In the past few decades, India has been experiencing a significant cultural change towards “westernization” alongside a substantial economic boom largely driven by the growth of Information Technology (IT) sector; these changes are felt particularly acutely in the urban cities [1]. These cultural and economic changes may be in part responsible for increased work stress and overall emotional distress [1–4].

IT companies in India are concentrated in larger cities, where it is easier to find talent and build a centralized infrastructure. The global nature of the IT industry requires that Indian IT professionals remain in around-the-clock communication with global partners [5]. IT professionals are expected to migrate to larger cities, work longer hours, and be available to support mission-critical responsibilities of the Indian IT industry [5]. Organizations have only recently begun to understand that such demands may adversely affect employees’ psychological well-being, and that more needs to be done to prevent burnout, reduce attrition, and increase positive productivity [6]. However, large-scale studies of mental health of the IT professionals in India are lacking.

Indian IT professionals are also coping with cultural changes [5]. Indian society has traditionally been collectivistic, promoting social cohesion and interdependence. The traditional Indian joint family has proved itself to be an excellent resource for childcare and for caring for physically and mentally ill household members [7]. However, one of the most significant alterations in the changing society is the disintegration of the joint family and the rise of nuclear and extended family system, particularly in the urban cities.

IT sector jobs being clustered in larger urban areas present an additional risk factor. The prevalence of numerous mental health conditions is up to three times higher in metropolitan cities than in rural areas or non-metropolitan (under one million in population) cities [8-9], and recent studies indicate an increase of mental disorders, especially in metropolitan cities [2,10].

The nature of work pressures in contemporary IT organizations requires employees to work longer hours, and experience stressful workload, performance pressures, and competition [11]. There is a growing body of evidence suggesting a correlation between stress related to work and mental health issues such as depression and anxiety, both outside of India [12-13] and in India [2,14].

The social changes and job-related pressures are unlikely to ease, and therefore the already substantial rates of mental health concerns are likely to rise. It is important to attain a better understanding of the prevalence of mental health issues in various occupational sectors across India, and perhaps especially in the IT sector, considering its central role in India's growing economy.

METHODOLOGY

Participants

896 participants consented to take part in an online survey. Eligible participants were adult (18+ years of age) residents of India, working in an IT sector in India at the time of the survey, with an ability to understand written English. Participants were recruited between 25th May, 2016 and 20th October, 2017 via IT email lists, Facebook, other social media, direct distribution of the survey to employees of IT companies in India, and word of mouth.

Measures

- **Demographics:** Individuals reported their age, gender, level of education, employment status, marital status, subjective social status [15], type of job in the IT industry (software engineer, marketing etc.), current place of residence (village, town, or city), and whether they were in a managerial or a non-managerial position.
- **Perceived Stress Scale-10 (PSS-10):** [16] is a 10-item self-report instrument for measuring current perceived stress. Chakraborti and others found adequate validity and reliability of PSS among Indian population. Scores of 14-20 indicate presence of mild stress, and scores of 21 and higher indicate presence of moderate to severe stress [16-17].
- **General Anxiety Disorder Scale-7 (GAD-7)**[18]: It is a widely-used 7-item scale assessing generalized anxiety symptoms in the past two weeks. Mayston and others found excellent reliability and validity of GAD-7 in the Indian population [19]. Scores of 5-9 indicate presence of mild anxiety and scores of 10 and higher indicate the presence of moderate to severe anxiety [18].
- **Patient Health Questionnaire-9 (PHQ-9)** [20]: It is one of the most common self-report measure of current (past two weeks) symptoms of depression. PHQ-9 was found to be valid and reliable in Indian population [21]. Scores of 5-9 indicate presence of mild depression, and scores of 10 and higher indicate the presence of moderate to severe depression [20].
- **Interpersonal Difficulties Scale (IDS):** This self-report measure was developed specifically for this study. The scale was designed to be culturally appropriate for the Indian IT population, cover a variety of daily interpersonal stressors, and be brief (to maximize the likelihood of completion). This 6-item scale assesses distress in the past two weeks due to interactions with their spouse, parents or siblings, a stranger, a supervisor, colleagues, and external help (e.g., chauffeurs or household help [22-24]), from 0 ("Not at all") to 3 ("Nearly every day"). Cronbach's alpha for IDS was 0.82 in this sample, suggesting high internal consistency. The cutoff scores were based on standard deviations from the mean ($M=4.9$, $SD=4.4$), thus, scores of 5-8 suggested mild interpersonal difficulty, and

scores of 9 and over suggested the presence of interpersonal difficulties, with scores of 9-13 suggesting moderate difficulties and 13-18 suggesting severe difficulties.

Procedure

Individuals interested in the study clicked on a link embedded in one of the advertisements described and were taken to the study website. The landing page offered a brief description of the study; it also collected initial demographic data (age, Indian residence, employment in an IT field), to assess eligibility. Eligible participants read the consent materials and consented by checking the appropriate box. No identifying information were collected at this point to preserve anonymity. Participants then proceeded to complete further demographic assessment, followed by measures of emotional distress (PSS-10, GAD-7, PHQ-9, and IDS). Participants were given feedback about their mental well-being based on their responses to the emotional distress measures. Participants reporting moderate to severe emotional distress were encouraged to seek help of professional agencies and provided links to global and India-based mental health hotline resources. Participants also completed other measures that are not part of this report. All procedures were approved by the Institutional Review Board of the Palo Alto University.

STATISTICAL ANALYSIS

Fisher's exact tests were used to compare men and women on other demographic factors. Stress, anxiety, depression, or interpersonal difficulties were considered "present" when a participant scored in the moderate to severe range. Chi-square analyses were conducted to understand the relationship between stress, anxiety, depression, and interpersonal difficulties within this population.

Binary logistic regressions were conducted to understand the demographic differences in emotional distress (presence (1) or absence (0) of stress, anxiety, depression, and interpersonal difficulties as dependent variables). Age (continuous variable), gender (male/female), relationship status (single/in a relationship), place of residence (large city / small town or villages), and job title (non-managerial/managerial position) were the predictors.

RESULTS

Demographic information

Slightly less than half (41.1%) of consented participants (N = 896) identified as female, and the average age of participants was 27.7 (SD=6.2). 68.0% reported being in non-managerial position, 46% of whom were women, and of those reporting to be in a management position only 32.0% were women (Fisher's exact test; $p < 0.001$; Table 1); thus, 25% of women and 37% of men reported being in management positions.

66.0% of participants reported being single and never married, with fewer males (63.2%) than females (74.3%) reporting being single (Fischer's exact test; $p = 0.001$). Almost half the participants (51.9%) reported living in non-urban areas. Participants tended to view themselves as being above average in terms of social status ($M = 6.8$; $SD = 2.1$; range 1-10).

Table 1: Percentage of Individuals in Non-management and Management Positions by Gender

	Non-Management 68.2% (n=573)	Management 31.8% (n=268)	Total N=841
Male	53.9% (n=309)	67.9% (n=182)	58.4% (n=491)
Female	46.1% (n=264)	32.1% (n=86)	41.6% (n=350)

Emotional Distress

788 participants provided at least some emotional distress data. On average, the stress, anxiety, and depression reported by Indian IT professionals was in the mild range (Table 2). Perceived stress was most commonly reported, with only 21.8% of participants reporting no perceived stress. Depression and anxiety symptoms were reported by two thirds of the participants (65.0% and 60.4%, respectively), and interpersonal

difficulties were reported by approximately half of the participants, though this is likely to be an artifact of how interpersonal difficulties categories were defined in this sample.

Table 2: Prevalence of Stress, Anxiety, Depression, and Interpersonal Difficulties

	Mean (SD)	Not Present (%)	Mild (%)	Present (%): Moderate to Severe
Stress PSS-10	17.81 (5.94)	21.8%	51.8%	26.4% Moderate:18.0%; Severe:8.4%
Anxiety GAD-7	6.16 (4.43)	39.6%	38.9%	21.5% Moderate:17.2%; Severe: 4.3%
Depression PHQ-9	7.19 (4.91)	35.0%	36.5%	28.5% Moderate: 21.0%; Severe: 7.5%
Interpersonal Difficulties	4.98 (4.37)	53.1%	24.1%	22.8% Moderate: 16.0%; Severe: 6.8%

Table 3: Comorbidity of Stress, Anxiety, Depression, and Interpersonal Difficulties

# of conditions	% Prevalence		
None Present	45.2%	-	
1 condition present	25.8%	Interpersonal Difficulties	33.5%
		Stress	29.9%
		Depression	24.7%
		Anxiety	11.9%
2 conditions present	16.5%	Anxiety & Depression	26.6%
		Interpersonal Difficulty & Depression	19.4%
		Interpersonal Difficulty & Anxiety	18.5%
		Stress & Depression	17.7%
		Stress & Anxiety	14.5%
		Interpersonal Difficulty & Stress	3.3%
3 conditions present	10.2%	Stress, Anxiety, & Depression	51.9%
		Interpersonal Difficulty & Stress & Depression	19.5%
		Interpersonal Difficulty & Anxiety & Depression	19.5%
		Interpersonal Difficulty & Stress & Anxiety	9.1%
4 conditions present	2.3%		

Table 4: Comorbidity of Stress, Anxiety, Depression, with Interpersonal Difficulties (ID)

# of conditions (stress, anxiety & depression)	% Prevalence		
Interpersonal difficulties only	38.2%		
Interpersonal difficulties and 1 other condition present	30.0%	Stress	44.6%
		Depression	47.0%
		Anxiety	8.0%
Interpersonal difficulties and 2 other conditions present	21.7%	Stress & Depression	40.5%
		Stress & Anxiety	18.8%
		Anxiety & Depression	40.5%
Interpersonal difficulties and 3 other conditions present	10.1%		

The prevalence of stress, anxiety, depression, and interpersonal difficulties were somewhat similar, with about a quarter of participants screening positive. It appears that the main differences between the four factors of emotional distress was in the “mild” range”, with 51.8% of participants reporting mild stress, compared to 38.9% reporting mild anxiety, 36.5% reporting mild depression, and 24.1% reporting mild interpersonal difficulties only.

Of the 766 participants who responded to all four measures of emotional distress (PSS, PHQ-9, GAD-7, and IDS), 45.2% had no presence of either stress, anxiety, depression, or interpersonal difficulties, 25.8% screened positive for one condition, 16.5% for two conditions, 10.2% for three conditions, and 2.3 % for all four conditions (see Table 3). As can be seen from Table 3, anxiety was the least likely and interpersonal difficulties is most likely to be present as a sole emotional distress issue (11.9% and 33.5%, respectively). Anxiety and depression were the most commonly endorsed two-condition combination (26.6% of those who endorsed two conditions), and stress, anxiety, and depression as by far the most commonly endorsed three-condition combination (51.9% of those reporting presence of three conditions did so). As could be expected, stress was likely to accompany anxiety or depression; thus, individuals with anxiety or depression were more likely to also report stress than individuals without either anxiety or depression ($\chi^2(1) \geq 71.19, p < 0.001$ and $\chi^2(1) \geq 45.43, p < 0.001$, respectively).

Additionally, individuals with one or more conditions of stress, anxiety or depression were more likely to report interpersonal difficulties than individuals without any stress, anxiety, or depression ($\chi^2(3) = 28.141, p < 0.001$; see Table 4). Just over one-third (38.2%) of the participants reported only interpersonal difficulties -- without other emotional difficulties such as stress, anxiety, or depression. 30% of participants with interpersonal difficulties reported one condition, with a higher percentage reporting depression or stress (47% and 44.6% respectively) than anxiety (only 8%). Over one-fifth (21.7%) of the participants reported two conditions with depression comorbid with stress or anxiety (40.5% and 40.5% respectively) being reported more than the comorbid condition of stress and anxiety (18.8%). Finally, 10% of the participants with interpersonal difficulties reported all three conditions of stress, anxiety, and depression.

Demographic Differences in Prevalence Rates

No demographic characteristics were found to be significantly related to the presence of stress (all $ps > 0.05$, though living in a small town or village was marginally related to lower odds of having stress, Wald chi-square (1) = 3.15, $p = 0.076$, OR = 0.73, 95%CI: 0.51-1.03). Presence of anxiety was only associated with living with big cities; thus, individuals living in small towns or villages had significantly lower odds of screening positive for anxiety (27.1% vs. 17.0%; Wald chi-square (1) = 9.24, $p = 0.002$, OR= 0.55, 95%CI: 0.38-0.81). Relationship status was associated with the presence of depression, with individuals who were not currently in a relationship having higher odds of experiencing depression (31.9% vs. 20.9%; Wald chi-square (1) = 4.52, $p = 0.03$, OR=1.69, 95%; CI:1.04-2.74). Regarding interpersonal difficulties, individuals living in smaller towns or villages had higher odds of experiencing interpersonal difficulties (33.8% vs. 7.8%; Wald chi-square (1) = 48.20, $p = 0.0001$, OR=6.01, 95%CI: 3.62-9.97) as did non-managers (26.7% vs. 14.8%; Wald chi-square (1) = 3.92, $p = 0.048$, OR=1.63, 95%CI: 1.01-2.65). Conversely, individuals in a relationship had lower odds of interpersonal difficulties (20.3% vs 23.9%; Wald chi-square (1) = 4.06, $p = 0.044$, OR = 0.57, 95%CI: 0.33-0.98).

DISCUSSION

The purpose of the study was to understand the prevalence rates of stress, anxiety, depression, and interpersonal difficulties among the IT population living in India. Though there has been several investigations of mental health issues pertaining to the Indian IT population [25–27], this is one of the first studies to jointly address stress, anxiety, depression, and interpersonal difficulties in this population.

The current study found that about one quarter of participants reported moderate to severe stress, anxiety, depression, and interpersonal difficulties. The 2015-2016 National Mental Health Survey of India found lifetime and current prevalence of mood disorders to be 5.8% and 2.8%, respectively, and of “neurotic” and stress related disorders -- 3.7% and 3.5%, respectively [8]. The current study focused on a subset of the Indian population – those working in the Information Technology field. The IT field is notorious for subjecting its

workers to a significant amount of work stress. Indeed, researchers reported that 51% of Indian IT professionals reported professional work-life stress [14]. Though our study focused on overall perceived stress rather than work stress, we also observed that almost 80% of participants reported mild to severe perceived stress in their lives, with over 25% reporting moderate to severe stress. While mild stress can be beneficial for productivity [28], persistent moderate to severe stress can be harmful, leading to anxiety, depression, and other emotional distress [29]. In our sample, over 71% of individuals with stress also reported anxiety, depression, and/or interpersonal difficulties. Thus, managing stress in this population may be especially important, and to do so effectively, future research may focus on identifying sources of stress, and especially on the gender and age differences in the sources of stress [30].

Previous literature has consistently shown that women have higher rates of depression than men, and that older individuals have a higher prevalence of depression and anxiety than younger individuals [31–34]. The fact that the current study did not find any significant differences between gender or age in the prevalence of depression or anxiety is unusual. Interestingly, there is emerging evidence that gender differences in mental health are attenuated when differences in socioeconomic status between genders are less pronounced [35]. In the current study, men were more likely to report being managers, and job status was controlled in our analyses. Both women non-managers and women managers may have perceived themselves to be at a higher social standing within their communities. It is therefore possible that within the Indian IT population, the gender differences are not as pronounced due to similar socioeconomic status.

Place of residence seem to matter to Indian IT population in terms of emotional distress. Interestingly, whereas living in smaller towns and villages was associated with lower anxiety (and stress, to some extent), it was strongly associated with the presence of interpersonal difficulties. Residents of Indian urban cities have transitioned towards nuclear families and adhere to less rigid religious beliefs, leading to possibly lower interpersonal difficulties than smaller towns or villages. Conversely, living in a large and crowded city may introduce additional stressors, and the likely more intense competition and job demands may increase anxiety. It is also likely that unmarried individuals face additional pressure from society, which may result in higher depression. Further research would be helpful in understanding the sources and cause of interpersonal conflicts. This would further aid in providing appropriate interventions at individual, family, and societal levels.

This study had several limitations that should be acknowledged. The study focused on a subset of the population in India – professionals working in the IT industry, which are perhaps more educated and affluent; although the results may generalize to other Indian IT professionals, they may not represent the larger Indian population. The data was collected largely from a particular region of India (South India) which is the center for IT industry. However, there is a growing population of IT professionals in North India, and it is possible that local stressors in North India may produce different outcomes vis-à-vis mental well-being. Though care was taken to create a recruit a sample representative of Indian IT professionals, the sample could be subject to unknown biases, and may not be representative of this population. Prevalence rates were estimated via gold standard self-report screening measures for anxiety and depression, however, participants were not diagnosed with mood or anxiety disorders by a qualified professional. Whether our findings of higher than expected level of mental health problems in Indian IT professionals is different from that of other industries in India or of IT professionals in other countries is not known. The measure of interpersonal difficulties was created specifically for this study, and its results need to be interpreted with caution. Some factors that could affect mental well-being (e.g., children, financial hardships, dependent adult care, health) were not captured, and more research is needed to better understand factors that may affect mental wellness in this population.

This study indicates that the Indian IT population are at a higher risk of screening positive for stress, anxiety, and depression than the reported averages within India. Additionally, the higher rates of anxiety and depression suggest a need for interventions within the Indian IT population, especially considering the stigma of seeking professional help for mental health issues in India [35]. Further study is warranted to understand the mental well-being within this population and the cause and effects of higher stress, anxiety, and depression. Additionally, further study is warranted to understand the coping strategies within this population and the different types of interventions used to cope with high emotional distress. Finally, similar

studies should be carried out in other occupational sectors, to better understand common and unique factors that may adversely affect mental well-being in various professions.

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Acknowledgements – Nil

Conflict of Interest – Nil

Funding – Nil