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Research Paper

Impact of Occupational Stress Among Army Aviation Ground Crew Personnel

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ABSTRACT

The role of army aviation in maintaining the national security is truly undeniable. The physical and mental pressure among them is immense. As a result, the occupational stress accompanying huge responsibility not only affects health and performance but also efficiency of aviation industry. The present study is an attempt to understand the impact of occupational stress on physical health and work performance of army aviation ground crew personnel in India. The data were collected from 60 male army aviation ground crew personnel (divided into 20-30 years and 30-40 years age group) from Hindustan Aeronautical Limited, Barrackpore Division, Kolkata, West Bengal. The results indicate that there exists a significant impact of occupational stress on the physical health and work performance of army aviation ground crew personnel. This happens due to unfavourable working conditions, pressure and family issues. This in turn reduces the work performance and leads to on job accidents and physical ailments. The present study explores the problems and difficulties of army personnel. The implications of the study are discussed further.

Keywords: *Army Aviation Personnel, Male, Occupational Stress, Physical Health, Work Performance, Job Satisfaction.*

The famous stress researcher Hans Selye (1976) defined stress as the "response of the body to any demand, whether it is caused by, or results in, pleasant or unpleasant conditions" (p.74). When this concept of stress is applied in occupations, it leaves the employee at a miserable condition (Rao & Chandraiah, 2012). Occupation is considered as an integral part of people's lives and occupational stress seemingly creeping into the organizational structure is a major threat and seems to be a major concern nowadays (Beheshtifar, 2013).

In the field of army aviation, where the ground crew personnel are responsible to maintain national security and have to be ready for instantaneous shift from peace time to combat operations, the level of occupational stress among them is one of the greatest concerns (Gortney, 2010). This is so because occupational stress beyond an optimum level has a

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negative impact on the health and work performance of army aviation ground crew personnel (Pflanz & Ogle, 2006). This could cost the nation to incur huge amount of money every year.

The National Institute for Occupational Safety & Health (1999) states that "Job stress, now more than ever, possess a greater threat to the health of workers and the health of the organizations."

Cooper & Marshall (1976) indicated that "in occupational stress negative environmental factors or stressors (example. work overload, role conflict/ambiguity, poor working conditions) is associated with a particular job". For example, aircraft maintenance usually requires 24 hours in the airline industry.

Costa et al. (2000) have pointed that due to shift work, ground crew personnel experience more adverse effects on both physical and psychological well- being.
Prolonged shift work can lead to sleep disorders which in turn can cause medical (gastrointestinal & cardiovascular), social, economic and quality of life problems (Schwartz & Roth, 2006). Likewise, rotating shift work can also lead to variety of health problems (Sookoian, Gemma et al., 2007). Indeed, the circadian desynchronization and fatigue associated with rotating schedules can be quite severe and has been shown to increase the accident rate twice on a fixed day or night shift (Gold et al.,1992).

Pflanz & Ogle (2006) observed that though military personnel have managed to adapt to the temporary hardships of wartime and humanitarian missions, the chronic stressors faced at home are found to be beyond their tolerance limit. Aviators may be less susceptible to stress than ground crew because the aviators' active participation in combat duties facilitates an internal locus of control that is psychologically protective. Oppositely, ground crews are less likely to perceive an internal locus of control for the outlet of their stress while performing the more passive duties of support staff (Campbell & Connor, 2010). At the same time, occupational stress arising out of routine military work environment is found to have significant negative impact on the mental health of military personnel (Pflanz, 2001; Pflanz & Ogle, 2006). Sparkes and his colleagues (1997) have also pointed out that there is a significant positive correlation between long working hours (over 12 hours per day) and poor physical and psychological health. The army being an organization of strict rules, regulations orders and pressures, does not give the discretion to its personnel to act as per their perceptions or best judgement (Sharma, 2015). According to Liu et al. (2005), low job control may create passive feeling about their job, since they always have to listen to somebody and this passive feeling could lead to physical ill health, even without their being conscious of it. Similar scenario is found in India as well, the personnel have to work strictly as per the directions of their officers and seniors and do not have the authority to choose working hours (Sharma, 2015).

Another contributor to occupational stress among Indian army aviation ground crew personnel is "unhelping co-workers" (Sharma, 2015). Nair & Kamalanabhan (2011) emphasised that assignments based upon high interdependence of team members often have interdependent outcomes which require co-operation of all members and is positively related to both task and psychosocial outcomes including greater member satisfaction. In India, although the army facilitates continuous training programmes, the personnel believe that the kind of training required for fulfilling their duties adequately is not provided (Sharma, 2015). Lack of training and development can have several ill-effects on individuals,

especially army men who usually work with hazardous equipment under dangerous conditions (Sharma, 2015).

Though the Indian government have taken several steps to counteract the problem of stress in the army, such as recruiting psychiatrists, discussions by the defence ministry with the expert panel of psychiatrists, initiating stress-busting therapies, practicing meditation and yoga (Gupta, 2008), but despite that suicides and fratricides in the army are recurrent.

Therefore, aim of the present study is to understand impact of occupational stress on the physical health and work performance of army aviation ground crew personnel.

METHODOLOGY

Objectives

To study the impact of occupational stress on the physical health and work performance of army aviation ground crew personnel. Here, work performance is measured in terms of job satisfaction and work-related accident or injuries.

Research hypotheses

- There will be impact of occupational stress on physical health of army aviation ground crew personnel.
- There will be impact of occupational stress on job satisfaction of army aviation ground crew personnel.
- There will be impact of occupational stress on work related injuries or accidents among army aviation ground crew personnel.

Sample

The sample consisted of 60 male army aviation ground crew personnel from Hindustan Aeronautical Limited, Barrackpore Division, Kolkata, West Bengal. Survey method was used to collect data and the method of study included random sampling without replacement. An informed consent was taken from each of the participants prior to the study. Confidentiality of the data was maintained.

Inclusion criteria

In this research study only male army aviation ground crew between the age group 20-40 years are included and the minimum educational qualification of participants was Higher Secondary.

Exclusion criteria

Civilian, administrative staffs, under training ground crew personnel and female participants are not involved.

Test/Tools

For study, the background information schedule of the participants was designed which consisted of age, marital status, number of children, working spouse, annual income and duration of stay in present location of participants.

The individual medical health record was also obtained which consisted of the participant's blood glucose level, blood pressure and weight.

Occupational Stress Index (OSI) The Occupational Stress Index (OSI) Test was developed by Dr. A.K. Srivastav Dr. A.P. Singh. It was published in 1989 (updated in 1992). The purpose of OSI is to measure the extent of stress which employees perceive arising from various constituents and conditions of their job. It is a 46 items test, out of which 29 are true keyed and 17 are false keyed. The Cronbach's alpha-coefficient for the scale as a whole were found to be 0.935 & 0.90 respectively.
Scoring: There is a five-point scale for measuring the responses
True keyed: SD-1, D-2, U-3, A-4, SA-5
False keyed: SD-5, D-4, U-3, A-2, SA-1
Where, SD– Strongly disagree, D– Disagree, U–Undecided, A– Agree, SA– Strongly agree

Job Satisfaction Scale (JSS) The Job Satisfaction Scale (JSS) was constructed and developed by Dr. Amar Singh and Dr. T.R. Sharma (1986). Job satisfaction is one of the most widely researched topics in organizational psychology, which reflects an employee's overall assessment. It has theoretical and practical utility and is linked to important job outcomes including absenteeism, employee turnover, health, organizational effectiveness and attitudinal variables such as job involvement and organizational commitment. The JSS consists of 30 items to be responded on five-point scale. The test-retest reliability was found out to be 0.978 within a gap of 25 days.
Scoring: The JSS consists of 30 items. The maximum possible score on the scale is 150 and the minimum score is 30.

Procedure
A permission was obtained from the authority of Hindustan Aeronautical Limited, Barrackpore. Once the permission was obtained, the date and time was fixed with the authority to meet the military aviation personnel to discuss the topics of study and were explained about the aims and objectives of the study.

Only the willing persons were requested to come on the fixed date for data collection. All of their questions were answered after giving instructions for the questionnaire.

The order of presentation of questionnaire was kept same for all the participants. Once the participants gave the consent, data was collected for occupational stress level, job satisfaction level, injuries report and health records from annual medical examination. Then finally interpretation and conclusion were drawn.

Statistics
Analysis was done in SPSS (Statistical Software for Social Sciences). Descriptive statistics and charts were used to understand nature of variables. Whereas, mean, t-test (for continuous data) and correlation (for categorical data) were used to draw inference.

RESULT

Both descriptive and inferential statistics were used in the present study to understand relationship among variables. In case of descriptive statistics, demographic profile of respondents was recorded.

In this study, only male personnel participated. Two age groups were included, first group is 20 – 30 years, comprised of 25 participants (42% of total sample size) and 30 – 40 years consisted of 35 participants (58% of total sample size).

In case of education level, participants who have qualified Higher Secondary is 40 (66%), Diploma is 15 (25%) and Graduation is 5 (9%). Work experience shows, participants of the age group 20-30 years have an experience of 7 years (43% of the sample size) and that of the age group 30-40 years have 16 years' experience (57% of the sample size).

Next is marital status of the participants, it was found that in the age group 20-30 years the number of married participants is 8 (13% of total sample size) and unmarried participants is 17 (28% of total sample size). Whereas, in the age group 30-40 years, all of the participants are married (58% of the total sample size).

The participants belonging to the age group 20-30 years have an annual income of 4 lakhs and those belonging to the age group 30-40 years have an annual income of 5.5 lakhs.

It was further observed that the blood glucose level of participants in 20-30 years age group is 157 and in 30-40 years it is 147. In the age group 20-30 years, out of 25 participants, 13 (i.e., 52%) have reported medical issues, whereas among 30-40 years, out of 35 participants, 15 (i.e., 42%) have medical issue or physical ailments. Moreover, the upper level of blood pressure range in age group 20-30 years married personnel is 128 and unmarried personnel is 123.

Table 1: Demographic details of the respondents

Demographic measures	**Group 1 (n=25) (20-30 years)**	**Group 2 (n=35) (30-40 years)**
Work experience	7 years (43%)	16 years (57%)
Marital status		
➢ Married	8 (13%)	35 (58%)
➢ Unmarried	17 (28%)	-
Annual income	4 lakhs per year (48%)	5.5 lakhs per year (52%)
Medical issues reported	13 (52%)	15 (42%)
Blood glucose level	156	120
Upper level of blood pressure		
➢ Married	128	130
➢ Unmarried	123	-
Mean OSI score		
➢ Married	135.12	137.14
➢ Unmarried	116	-
Mean score of JSS		
➢ Married	71.59	67.89
➢ Unmarried	88.25	-

It was also found that in the age group 20-30 years, the mean score of OSI among married and unmarried personnel is 135.12 and 116 respectively and the mean score of JSS among married and unmarried personnel is 71.59 and 88.25 respectively. Similarly, in the age group 30-40 years, since all the 35 participants are married, therefore, the mean score of OSI and JSS among them is 137.14 and 67.89 respectively.

Mean, correlation (for categorical data) and t-test values (for continuous data) were shown in Table 2 and 3. From correlation values it was clear that a negative correlation exists between Occupational Stress Index (OSI) and Job Satisfaction Scale (JSS); r = -0.35, p = 0.006. This means, if occupational stress increases, job satisfaction will decrease and vice versa. Another, significant negative relationship was observed between Job Satisfaction Scale (JSS) and blood pressure, r=-0.379, p=0.003. So, if job satisfaction increases, blood pressure will be normal.

Table 2: Correlation matrix

	Occupational Stress Index (OSI)	**Job Satisfaction Scale (JSS)**	**Blood Pressure**	**Blood Sugar**	**Injury**
Occupational Stress Index (OSI)	—				
Job Satisfaction Scale (JSS)	-0.35	—			
Blood Pressure	0.15	-0.379	—		
Blood Sugar	0.112	0.172	0.150	—	
Injury	0.233	-0.143	0.149	0.056	—

Table 3: t-test values

	Mean (Group 1)	**Mean (Group 2)**	**t-value**	**p**
Blood Pressure	0.68	1.03	2.015	0.051*
Sugar Level	2.60	2.0	3.217	0.003**
OSI	122.11	137.14	-1.072	0.289
JSS	82.92	67.89	1.049	0.300

**p≤.05; **p≤.01*

However, a positive relationship was observed between OSI and injury, r = 0.233, p = 0.053, which tells us that if stress increases, injury will also increase. No significant relationship was found between OSI and blood pressure; OSI and sugar level; JSS and sugar level and JSS and injury. t-test results show significant group difference with respect to blood pressure (t = 2.015, p = 0.051) and sugar level (t = 3.217, p = 0.003). The mean blood pressure value of group 1 (20-30 years) is 0.68 and group 2 (30-40 years) is 1.03 respectively. This means, blood pressure of group 2 is certainly higher than that of group 1. Another significant group difference was present in sugar level of two groups (t = 3.217, p = 0.003). Mean value shows, sugar level of group 1 is higher (2.6) in comparison to group 2 (2.0). No significant group difference was found between group and OSI, JSS and number of injuries.

DISCUSSION

In present study an attempt has been made to understand the impact of occupational stress on performance and physical health of army aviation ground personnel. Mean scores of Occupational Stress (OSI, see Table 1) between married and unmarried personnel of respective age groups shows that the value of OSI is certainly higher in case of married personnel. This is because family dispute influences work life and in turn increases occupational stress level. This was found in the research conducted by Sivasubramanian and Rajandran (2017) regarding the study of stressors affecting Indian air force personnel, where

family discords, prolong separation from family and deficient in attending to family commitments, failure to take over family responsibilities were counted as the causes of stress. An increase in occupational stress also reduces a person's job satisfaction level as both of them are negatively correlated. Findings of the present study support the same (Table 2). A person with a low job satisfaction cannot pull his effort in his job which directly impacts his work performance. This has been supported in the prior studies that indicated that an individual with high level of job satisfaction tends to have a positive attitude, in contrast to the one with lower level of job satisfaction. This ultimately impacts the working environment and the work performance (Chanane, 2017).

Further from the correlation matrix (Table 2), it is observed that there is a significant positive correlation between occupational stress and injury level, that is, if stress increases then injury will also increase. High occupational stress level reduces one's concentration on the job and results in distractions and mistakes. These lead to accidents or injuries while working on equipment or any maintenance activities by army aviation ground crew personnel. This finding is also consistent with the study conducted by Taşbaşi (2002) regarding stress management in army aviation and an empirical assessment of aircrew stress. Also, there exists a significant negative correlation between job satisfaction and blood pressure. In aviation field high precision, skill and constant alertness are required which can sometimes become very frustrating and leads to lower job satisfaction level. These frustrating job condition can increase blood pressure which can impact their work performance and sometimes lead to accidents or injury during work on an equipment. Similar results were obtained by Pinkerton (2019), where he highlighted that depression, stressful working circumstances and pessimistic frame of mind are associated with hypertension. In aviation, flight safety is paramount and those ground crew personnel working on aircrafts always have to be physically and mentally fit because of physical health issues, human error in technical activities or aircraft servicing are common.

The t-test values (Table 3) also show that there is a significant group difference with respect to blood pressure, where the mean value of blood pressure for group 2 (age group 30 – 40 years) is higher than that of group 1 (20 – 30 years). This is partly because with increase in age the chance of having high blood pressure increases. This is also consistent with the study conducted by Pinto (2017) which says that the increase in blood pressure with age is caused due to structural changes in the arteries and especially with large artery stiffness.

Moreover, according to an article on the environment and blood pressure (Brook, 2017), exposure to adverse environmental conditions also increases the blood pressure of the personnel falling in this age group. Also, there is another significant group difference present in terms of the sugar level of the two groups, where the mean sugar level of group 1 is higher than that of group 2. This is because the personnel belonging to the age group 20-30 years are under low decision authority, high uncertainty and their job is complicated which requires high precision, alertness and to work in adverse environmental conditions. This results in tension and stress which leads the adrenal glands to trigger the release of glucose stored in various organs which often leads to elevated level of glucose in the blood stream (Caporuscio, 2019).

Although this study provides a seminal basis for the furtherance of research in the area of occupational stress and its impact on physical health and work performance among the army aviation ground crew personnel, it is limited in some ways. Firstly, the research was conducted only on the army aviation ground crew personnel and did not take into account of

army pilots, navy and air force personnel. Secondly, only male personnel were chosen for the study. Lastly, the study included some demographic constraints, where research was solely conducted on the army aviation ground crew personnel of Kolkata. Due to limited time availability, the study could not represent the conditions of the army aviation ground crew personnel of other states of India.

Despite the limitations, the study is quite capable of exploring the possible effects of occupational stress on the physical health and work performance of army aviation ground crew personnel. It has given a picture of work and health conditions of army personnel and its impact on their professional life in India. The results convey that with increase in occupational stress among ground crew members, their job satisfaction decreases which ultimately has a direct impact on their work performance. Moreover, with increase in occupational stress, the chances of accidents and injuries are increased and at the same time several health-related issues also emerge. Thus, in order to improve the efficiency and work performance of the ground crew personnel, further studies should be conducted on this topic and the higher authority also needs to plan out the ways to reduce the work load and improve the working conditions at the workplace.

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Conflict of Interest

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