Occupational Stress Among Ground Crew : An Empirical Study of Aviation Industry in Northern India

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Abstract

Indian aviation industry has been emerged as one of the fastest growing industries of the country over the past few years which is witnessed from the incessant growth in domestic and international passenger traffic. On the flipside, the infrastructure required to cope with the increasing demands has not been developed in the same pace. The upgrading technology, huge workload, rigid work schedules, diverse cultures of passengers, complex work environment and many other factors cause stress among aviation sector employees. After considering the major roles played by ground crew in handling the work load and little studies conducted on this group in the past, the study attempted to identify the level of occupational stress and major contributing occupational factors in relation to the stress symptoms among ground crew. The level of stress was classified into low, medium and high on the basis of Quartile range. Correlation coefficient was applied to measure the association between organizational stress factors and stress symptoms and further followed by the Step-wise multiple regression to find the potential organizational factors causing significant stress. The study found the majority of respondents from ground crew suffering from the medium level of stress. Correlation coefficient revealed significant positive association among seven organizational factors and stress symptoms out of the total ten. The step-wise multiple regression analysis resulted a model with three organizational factors to be the best fit which contributed maximum stress variance.

Key Words

Occupational Stress, Stress Symptoms, Organizational Stress Factors, Level of Occupational Stress, Ground Crew Members, Indian Aviation Industry.

INTRODUCTION

Occupational stress can be stated as the harmful physical and psychological response to the exceeding job requirements than the capabilities or resources of a worker. The rising demands at the present work environment have been causing huge pressure which sometimes becomes unmanageable for the work force; consequently, leads to stress. Over the last few decades, the occupational stress has been grown to the alarming level which might have happened because of rising competition, advancement in technology, growing globalization, automation of work process, complex system and many other factors. Hans Selye in 1936 defined the stress as a non-specific response of the body to any demand for change. As per the views of Richard S. Lazarus (1966), stress can be defined as a situation when a person believes to be incapable in terms of personal and social resources required to fulfill the needs or demands of another person. Though the term stress is generally considered as bad, there exist two kinds of stress, i.e., Distress or "bad" stress and eustress or "positive" stress. The positive stress works as a motivator factor to cope with the highly competitive environment, but when stress limit exceeds the bearing capability of a person, it turns to be the bad factor.

The WHO (2007) defined the occupational stress as a condition which is faced by the people due to the work demands and different types of pressures which do not match with their level of knowledge and capability; consequently, their capacity to handle the complex environment is adversely affected. The rising level of competition among the present dynamic businesses is turning the organizational roles more complex, ultimately there occurs more stressful environment. Though the factors causing occupational stress may vary among different professions, adverse implications on employees and organizational performance and productivity can be seen everywhere. Pareek (1983) considered the stress as an inherent problem in the performance of a role.

Aviation sector employees are considered as one of those groups who face the higher job pressures. The higher level of knowledge and specialization is required in practical application of gathered skills which makes their job more complicated. Not only the systematic procedures, but also the stringent regulations put huge pressure on aviation industry work force. Over the last few decades, the Indian aviation sector has witnessed a splendid growth rate which makes the scenario even more complicated as the growth rate of Indian

infrastructure required to cope up the rising demand for services is comparatively low. The Indian aviation sector has provided services to the 79 million people on domestic as well as international level during 2010 which was doubled to 158 million by 2017 and expected to reach at 520 million by 2037 which indicates high growth potentials in future; hence, high work pressure on aviation employees.

For the sake of aviation efficiency and safety, services provided by ground crew occupy a vital place. Their work generally covers the check-in, VIP lounge, flight control center, ticket information counters, boarding gate, customs-immigration-quarantine and many other important functions of airports and airfields which require due attention. The increasing work pressure on Indian aviation industry is majorly impacting the ground crew as having an invaluable place in the entire industry. The urgent flight durations and irregular shifts put the work of aviation ground crew employees under heavier pressure than the other industries which not only affect the individual health and performance, but also the organizational safety and efficiency.

Keeping under view the vital place of ground crew in managing the huge work pressure in Indian aviation industry and the exposer of adverse consequences to their health, the present study has been conducted. As there has been a very few studies in the past on this concern, it was needed to conduct an empirical study to know the major occupational stressors affecting the ground crew of Indian aviation industry. This paper is an attempt to analyze the impact of organizational stress factors on members from ground crew.

LITERATURE REVIEW

There are a number of previous studies conducted on aviation sector throughout the world but only a few have been found concerned with Indian aviation industry, especially on ground crew. The studies conducted in India as well as in others countries have been included in the review.

Barnes (1992) explored the stress level of aviation personnel of Air India airlines by collecting data from 52 members. The study compared the stress symptoms of cabin crews with that of pilots and engineers and found the cabin crew under more stress. The major stress contributing factors were found to be the duty schedule, satisfying the passenger needs and to maintain the image of organization. It was suggested to make harmony among personnel to control the stress level.

Homan (2002) revealed under the study that the crew members should not ignore the early signs of stress and also identified that there has been a significant impact of stress resistance training on aviation sector employees conducted under the study. He also recommended to follow the physical activities and balanced diet for aviation employees to minimize the impact of stress.

Deborah A. Blacka, *et al.* (2007) examined the implemented noise management regulations and other rules and regulations of commercial airports. The study aimed at implementing a new noise measurement method to measure the noise levels in the environment by studying the existing noise measurement technique. After analyzing the confounding factors, the study concluded that the factors generating high level of noise are more likely to develop high stress and hypertension than the other factors.

Kuo-Shun Sun, *et al.* (2011) studied the impact of work pressure on air transport ground crews and found this group as most often suffering people from work pressure. The study found the adverse impact on health of employees as well as on their performance and also identified the different stress factors working behind this stress. Some coping strategies were also found as effective to maintain work balance and performance.

Divya Narayanan, *et al.* (2012) analyzed the level of stress and fatigue, the impact of lifestyle on health, the causes of stress and fatigue and the mechanism of coping among 150 airline pilots and engineers. Each respondent was approached to get4 questionnaires filled for each objective. Both pilots and engineers were found to be highly stressed and the major causes were found as lack of exercise and demanding job profile. The best coping strategy to alleviate stress was identified as sleeping adequately and spending time with family.

Carla Aguirre Mas, *et al.* (2018) established the link between burnout syndrome, stress at work, level of job satisfaction and work family conflict among air traffic controllers by analyzing the concerned variables such as age, gender, performance of work, their civil status, type of work and children presence or absence. The study found the significant and direct proportional difference between job tenure and fatigue, burnout and family conflict, work stress and cynicism while measuring the burnout.

Tran Cam T. H., *et al.* (2020) identified the common reasons, signs, symptoms and consequences of work stress by studying the previous researches

and interviewing the heads and managers of Vietnamese companies. The stress was classified into three categories, namely acute stress, episodic stress and chronic stress on the basis of sources of stress. The study proposed an approach to measure stress which was based on psychological, physiological and autonomic methods.

Mensah (2021) investigated the mediating role of social support in the relationship between job stress and mental health of male and female workers in Europe by analyzing the data collected from working conditions survey of 35 countries in Europe. The study used Hayes process macro modeling technique and found the direct negative effect of job stress on mental health of working adults and similar mediating effect of social support on both men and women. The study highlighted the importance of support from colleagues and supervisors at work to reduce the stress level.

OBJECTIVES

The objectives of the study are as follow :-

- To study the level of occupational stress among ground crew.
- To identify the organizational factors which are potential to produce stress.
- To provide some useful suggestions to overcome the stress causing organizational factors.

RESEARCH METHODOLOGY

The study used the primary data which was collected from international airports located in the Northern region of India. On the basis of aircraft movement of international airports (AAI Report 2019), three (top, middle and lower) airports were selected out of the total six international airports. These included Indira Gandhi International Airport, Delhi; Sri Guru Ram Dass Jee International Airport, Amritsar, Punjab; and Chandigarh International Airport, Chandigarh. Top 7 scheduled airlines out of 14 scheduled airlines (under AAI regulation) were selected for the data collection.

The sample data has been collected from ground crew which comprised of mainly the airport managers, air-traffic controllers, airport authority, airport service agents, customer relationship manager, security managers, duty managers, engineers, technicians, and aircraft maintenance. 144 questionnaires were distributed among members of ground crew of various airline companies

selected under the study. 134 questionnaires served as sample for the study on account of duly filed.

Data was collected by means of structured questionnaire consisting of Udai Pareek's (1983) Organizational Role Stress scale and Srivastva's (1999) Stress symptom inventory. Organizational Role Stress scale consisted of 50 items divided into 10 types of stressors. Srivastva's Stress symptom inventory is the list of 39 items indicating the physical, psychological and social relational stress symptoms. Five point Likert scale has been used for Organizational Role Stress scale and Four point Likert scale for Stress symptom inventory.

Reliability and Validity for Scale

Cronbach coefficient alpha has been used to check the reliability of scale. The results indicate that the value of Cronbach alpha for 'Organizational Role stress scale' is 0.929 and for 'Stress symptom inventory' 0.790 which is higher than 0.70(Nunnally, 1978).The various forms of validity measures such as Content Validity, Construct Validity and Discriminant Validity have also been calculated. The reliability and validity of scale have been confirmed through Confirmatory Factor Analysis (CFA). The given values in Table 1 concluded that the model fits the data well, hence, further analysis can be proceeded for CFA.

Table 1
Model Fit Indices of the Measurement Model

Index of Fit	CMIN/DF	NFI	IFI	TLI	CFI	RMSEA
Recommended Value	1-3	>0.80	>0.90	>0.90	>0.90	<0.08
Measurement Value	1.500	0.825	0.934	0.928	0.933	0.061

Source : Calculated through SPSS AMOS

The content validity of the instrument was assessed from experts' views. Convergent and Discriminant validity are measured to confirm the Construct validity. The analysis of Convergent validitycomprises of the measurement of Composite Reliability (CR) of each construct that needs to be greater than 0.70, Average Variance Extracted (AVE) should be more than 0.50, and the criteria of CR>AVE should be fulfilled.

The various indices of validity are given in the following Table.

Table 2
Measures for Validity

Factors	CR	AVE	MSV	ASV
Inter-Role Distance (IRD)	0.82	0.81	0.29	0.11
Role Stagnation (RS)	0.97	0.88	0.01	0.00
Role Expectation Conflict (REC)	0.93	0.74	0.37	0.06
Role Erosion (RE)	0.97	0.87	0.24	0.03
Role Overload (RO)	0.96	0.83	0.46	0.11
Role Isolation (RI)	0.95	0.79	0.02	0.00
Personal Inadequacy (PIN)	0.95	0.78	0.46	0.09
Self-Role Distance (SRD)	0.96	0.83	0.24	0.00
Role Ambiguity (RA)	0.96	0.84	0.39	0.1
Resource Inadequacy (RIN)	0.96	0.82	0.16	0.03

Source : SPSS AMOS 23.

The given values in Table 2 show the acceptable limits for all validity indices. Convergent validity has been proved as Composite Reliability (CR) of each construct in the given Table is greater than 0.70. Further, Average Variance Extracted (AVE) for each construct is greater than 0.50 and the comparison between Composite Reliability (CR) and Average Variance Extracted (AVE) confirmed the required criteria of Convergent validity i.e., CR>AVE. To confirm the Discriminant validity, the Average Variance Extracted (AVE) should be greater than Maximum Shared Squared Variance (MSV) and Average Shared Square Variance (ASV). The calculated value of AVE for each construct as mentioned in the Table is greater than MSV and ASV. Resultantly, the scale satisfied all validity requirements.

RESULTS AND DISCUSSION

Level of Occupational Stress Among Ground Crew

Table 3 indicates the level of occupational stress among ground crew members.The level of occupational stress has been measured on the basis of Q1 (Quartile) and Q3 of Average occupational stress scores. The results show the highest number of employees i.e., 68(50.75%) fall in medium level of stress category, 36(26.87%) fall in low stress category and the remaining 30(22.38%) fall in the category of high stress level.

Table 3

Level of Occupational Stress

Level of Stress	Number of Employees	Percentage (%)
Low	36	26.87
Medium	68	50.75
High	30	22.38
Total	134	100

Analysis of Organizational Stress Factors in Relation to Stress Symptoms

The prevalence of occupational stress in almost every kind of profession has made it a major challenge to the health of employees and organization itself. There may be different major stressor among different professions, same kinds of adverse consequences can be seen among employees and work places. Some stress factors may have more potential to cause stress and affect a particular kind of work force. The similar affect can also be seen among aviation sector employees. Therefore, in order to identify the maximum stress causing organizational stress factors among ground crew, multiple regression analysis has been performed. It was followed by considering the stress symptoms of ground crew as dependent variable and organizational stress factors as independent variables. The value of dependent variable has been calculated for each respondent by adding the original scores given by respondents to 39 stress symptoms.

The association between organizational stress factors and stress symptoms has been measured through correlation analysis which shows several statistically significant coefficients.

The correlation matrix reported in Table 4 uncovers that that stress symptoms had been positively and significantly associated with Inter-role distance (IRD = 0.456, $p < 0.01$), Role expectation conflict (REC = 0.307, $p < 0.01$), Role erosion (RE = 0.208, $p < 0.05$), Role overload (RO = 0.339, $p < 0.01$), Personal inadequacy (PIN = 0.364, $p < 0.01$), Role ambiguity (RA = 0.434, $p < 0.01$) and Resource inadequacy (RIN = 0.346, $p < 0.01$). Stress symptoms had also been found associated positively but insignificantly with Role stagnation (RS = 0.036), Role isolation (RI = 0.009) and Self-role distance (SRD = 0.032).

Table 4

Correlation Matrix of Stress Symptoms and Organizational Stress Factors

	S S	IRD	RS	REC	RE	RO	RI	PIN	SRD	RA
IRD	0.456**									
RS	0.036	0.051								
REC	0.307**	0.363**	-0.094							
RE	0.208*	0.289**	-0.151	0.014						
RO	0.339**	0.437**	0.019	0.555**	0.161					
RI	0.009	0.057	0.070	-0.121	0.113	-0.024				
PIN	0.364**	0.524**	0.002	0.558**	0.152	0.664**	-0.015			
SRD	0.032	0.189*	-0.240**	-0.150	0.459**	0.029	0.076	-0.054		
RA	0.434**	0.495**	-0.021	0.559**	0.263*	0.653**	0.060	0.583**	-0.035	
RIN	0.346**	0.419**	0.119	0.236**	0.079	0.223**	-0.039	0.285**	-0.026	0.264**

** $p < 0.01$, * $p < 0.05$

Further, the cause and effect relationship between organizational stress factors and stress symptoms has been examined through multiple regression analysis. The results are mentioned in Table 5 and 6.

Table 5 highlights that Inter-role distance (IRD) has been found to be the most significant (B=0.799) factor causing occupational stress to the respondents.The factor has a positive association with the stress symptoms of respondents which indicates thatthe higher the conflict between the organizational roles and personal roles, more the level of stress among respondents. Role ambiguity (RA) has been found to be the second most significant (B=0.753) factor affecting stress level of respondents positively. It indicates that the lack of clarity in respect to the expectations from role or role occupant will increase the level of stress. Further, Resource inadequacy (RIN) has be found to be the third most significant (B=0.618) and Role erosion (RE) to be the fourth significant(B=0.316) factor to affect positively. It shows that the increase in unavailability of resources will increase the level of stress. Also the increase in sharing of important roles with other employees which tends to decrease the importance of job will increase the stress level of respondents.

Table 5

Organizational Stress Factors and Stress Symptoms : Regression Coefficients and Other Relevant Statistics (Enter Method)

Factors	Unstandardized Coefficients		Standardized	t-Coefficients	Signi-svalues	Tole-ficant	VIF rance
	B	Std. Error	(Beta)		level		
Inter-Role Distance (IRD)	0.799	0.359	0.229	2.228	0.028	0.543	1.840
Role Stagnation (RS)	0.079	0.300	0.021	0.262	0.794	0.874	1.144
Role Expectation Conflict (REC)	0.168	0.411	0.042	0.408	0.684	0.533	1.876
Role Erosion (RE)	0.316	0.346	0.083	0.913	0.363	0.689	1.451
Role Overload (RO)	0.013	0.405	0.004	0.033	0.974	0.434	2.304
Role Isolation (RI)	-0.056	0.308	-0.014	-0.181	0.857	0.945	1.058
Personal Inade-quacy (PIN)	0.137	0.437	0.035	0.313	0.755	0.446	2.242
Self-Role Dis-tance (SRD)	-0.087	0.341	-0.023	-0.254	0.800	0.682	1.466
Role Ambiguity (RA)	0.753	0.409	0.209	1.839	0.068	0.441	2.268
Resource Inade-quacy (RIN)	0.618	0.319	0.164	1.937	0.055	0.796	1.257
$R^2 = 0.296$, Adjusted $R^2 = 0.239$, F = 5.183**							

**p<0.01, *p<0.05

After examining the individual contribution of organizational stress factors in the level of stress, step-wise multiple regression has been performed to build a regression model which will indicate the maximum stress variance. The results are presented in the following Table :-

Table 6

Organizational Stress Factors and Stress Symptoms : Step-wise Multiple Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.456a	.208	.202	3.73592	.208	34.731	1	132	.000	1.980
2	.515b	.266	.254	3.61175	.057	10.232	1	131	.002	
3	.538c	.289	.273	3.56646	.024	4.348	1	130	.039	

a. Predictors : (Constant), IRD
b. Predictors : (Constant), IRD, RA
c. Predictors : (Constant), IRD, RA, RIN

Table 6 exhibits that three out of total ten organizational stress factors examined as independent variables are found to be significant explanatory variables of stress. 'Inter-role distance' has been the first factor which enters the regression model explaining 20.2 percent of the variance (adjusted R^2 = 0.202).The next organizational stress factor that enters the regression model is 'Role ambiguity' (RA) increasing adjusted R^2 to 25.4 percent, followed by 'Resource inadequacy' (RIN) making adjusted R^2 to grow to 27.3 percent. It suggests that the three organizational stress factors which have been found to be the significant explanatory factors explain 27.3 percent of variance in stress.

Table 7

Regression Model with Selected Variables as well as all Variables

Organizational Stress Factors	R^2	Adj. R^2	F
IRD, RA, RIN	0.289	0.273	4.348*
IRD, RS, REC, RE, RO, RI, PIN, SRD, RA, RI	0.296	0.239	5.183**

**P<0.01, *P<0.05

Table 7 indicates that regression model with three factors, selected step-wise, is the best fit model with R^2 equal to 0.296 and value of F is 4.348 which is significant at 0.05 level. The entry of other stress factors did not add much to the explained stress variance. There is an increase of only 0.7 percent in R^2 but on the other hand adjusted R^2 decreases by 3.4 percent. The above

analysis reveals that the three factor model is the most fit model in the given situation which explains 27.3 percent of stress variance.

CONCLUSION AND SUGGESTIONS

The study uncovers that the majority (50.75%) of ground crew suffers from the medium level of stress. The analysis of data in respect to the organizational stress factors in relation to the stress symptoms indicates that out of ten stressors, there are three major significant factors, namely, Inter-role distance (IRD), Resource ambiguity (RA) and Resource inadequacy (RIN) which contribute significantly (27.3%) towards the stress variance. The conflict between one's organizational roles and other roles or not being able to manage time between work requirements and family requirements cause major stress. Lack of clarity about the work requirements cause role ambiguity and less availability of required resources for job such as workforce, material, finance etc. lead the major boost in stress level.

It has been observed that the adverse effects of Inter-role distance (IRD), Resource ambiguity (RA) and Resource inadequacy (RIN) should be mitigated by placing adequate measures by the organizations so that subsequent physical and mental distortion of employees can be prevented beforehand. It is essential to help the employees to maintain work life balance so that they can satisfy their family needs along with achieving the organizational goals. They should be provided with adequate working hours or flexibility in shifts when it is possible. Another step that needs to be undertaken is to provide the necessary information to the employees related to their job so that proper understanding can be developed among employees concerned with their job requirements and scope. It is also essential to fulfill the men, material and money requirements of various positions on time to cope up with the resource inadequacy stress factor. These steps are vital not only from the health perspectives of employees but also for the well-being of work places.

References

Arora, N. (2014), Personality Factor in Relation to Working in Indian Aviation Industry, Ph.D. thesis submitted to School of Management Studies, Punjabi University, Patiala.

Barnes, B. L. (1992), Stress in Aviation Personnel, *Journal of Psychological Studies,* 37(1), 1-6.

Carla Aguirre Mas, *et al.*, (2018), The Relation Between Work Stress and Burnout Syndrome in a Sample of Chilean Air Traffic Controllers, *Ciencias*

Psicológicas, 12(2), 239-248.

Deborah, A. Blacka, *et al.* (2007), Aircraft Noise Exposure and Resident's Stress and Hypertension – A Public Health Perspective for Airport Environmental Management, *Journal of Air Transport Management,* 13(5), 264-276.

Divya Narayanan, *et al.* (2012), An Assessment of Stress, Fatigue and Coping Strategies Among Airline Engineers and Pilots, *Public Health Research Series*, 1(1), 101-107.

Homan, W. J. (2002), Stress Coping Strategies for Commercial Flight Crewmembers, *Journal of Aviation / Aerospace Education & Research,* 12(1), Retrieved from https://doi.org/10.15394/jaaer.2002.1592 .

Kumar, H. (2012), Stress Among Airport Employees – A Case Study of Bangalore International Airport, Ph.D. Thesis Submitted to B.N. Bahadur Institute of Management Sciences, University of Mysore.

Kuo-Shun Sun, *et al.* (2011), Aviation Ground Crews : Occupational Stresses and Work Performance, *African Journal of Business Management*, 5(7), 2865-2873.

Lazarus, R. S. (1966), Psychological Stress and the Coping Process, New York : McGraw Hill.

McGrath, J. E. (1976), Stress and Behavior in Organizations, *In Handbook of Industrial and Organizational Psychology*.

Mesah, A. (2021), Job Stress and Mental Well-Being among Working Men and Women in Europe : The Mediating Role of Social Support, *International Journal of Environmental Research and Public Health*, 18, 2494.

Pareek, U. (2002), Training Instruments in HRD and OD. (2nd Ed.) New Delhi : Tata McGraw Hill Publishing Company Limited, pp. 545-547.

Pareek, U. (1983), *Role Stress Scale : ORS Scale Booklet, Answer Sheet and Manual,* Ahmedabad, Naveen Publications.

Pestonjee, D. M. (1992), *Stress and Coping – The Indian Experience,* New Delhi, Sage Publications.

Selye, H. (1936), A Syndrome produced by Diverse Nocuous Agents, *Nature*, 138(32).

Srivastava, A. K. (1999), Management of Occupational Stress, Theories and Practice, Gyan Publishing House, New Delhi.

Tran Cam T. H., *et al.* (2020), Stress Management in the Modern Workplace and the Role of Human Resource Professionals, *Business Ethics and Leadership*, 4(2), 26-40.

Internet Sites Accessed :
www.wikipedia.org/
www.jstor.org/
www.aai.aero/
www.civilaviation.gov.in/
http://knowindia.net/aviation2.html/