



IMPACT OF SLEEP QUALITY ON AVIATION EMPLOYEES' PERFORMANCE AT INTERNATIONAL WINGS GROUP: JOB STRESS AS A MEDIATOR

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ABSTRACT

Sleep is necessary for human beings to continue their life. However, the relationship between sleep quality, job stress, and aviation employees' performance has not been sufficiently examined in the past literature. The aim of this study was to evaluate the sleep quality and job stress between aviation employees at international wings group (IWG) and to examine the relationship between sleep quality, job stress, and aviation employees' performance. An electronic questionnaire was conducted among 246 aviation employees who are working at IWG, the electronic self-administered questionnaire comprising Pittsburgh Sleep Quality Index (PSQI), Parker & DeCotiis scale to measure Job Stress, Adaptive performance by Charbonnier- Voirin & Roussel to measure performance and socio demographic data. The relationship between categorical variables were analyzed using T test, Chi-squared, linear logistic regression test. A total of 246 participants completed questionnaires, 154 of them (response rate 62.6%) reported bad quality of sleep. with high level impact on job stress and performance. In addition, it reported high level impact between job stress and performance. This study showed that bad sleep quality was significantly related with elevated levels of job stress and performance at IWG employees.

INTRODUCTION

Job satisfaction is the ambition of employee to state that he is pleased with his job based on physical and environmental features available in work area (Mehmood & Maitlo, 2020). Aviation workers should be the field of an aviation organization's main skill, not outputs and technology were used (Appelbaum & Fewster, 2003). The effects of aviation employees are huge and universal, not less in importance than the organization's structure, strategy, culture, and operational accomplishments (Appelbaum & Fewster, 2003). Decades ago, information and data have been showed during investigation, that about 75% of aero plane accidents were due insufficient application of human factors that should be applied to the Engineers and Technicians (Hobbs, 2008).

Human factors in aviation related to human beings workers and their living circumstances (Hawkins, 2017). behaviors and integrations for knowledge in applied systems that planned and designed to be as added value, for safety and performance of all workers (Wise, Hopkin, & Garland, 2016). Since the forties of last century, data have been explored that 75% airplanes mishaps apparently due to deficient performance of the aviation employees (Hawkins, 2017). Hawkins et al. revealed that many factors affecting performance such as stress, fitness, time pressure, communications, training, fatigue and sleep quality (Hawkins, 2017).

Lack of Sleep quality is increasing unintentional errors (Whitmire et al., 2009). If people don't sleep enough time, they may encounter fatigue and stress in their jobs, for instance, studies showed that 24 hours without sleeping can lead to feel of fatigue and job stress as well as increase performance errors on next day (Banks, 2007; Durmer & Dinges, 2005; Harrison & Horne, 1998). Although fatigue is considered one of the greatest feature in our life and could be avoided, job stress is non preventable and couldn't be avoided for all employees (Dawson, Noy, Härmä, Åkerstedt, & Belenky, 2011). European aviation safety agency (EASA) defined Job Stress as any effect causes some noteworthy change to system forms when its applied, where effects could be physical, mental or social (EASA, 2018). It is noted that job stress is inversely proportional with Performance and sleep quality, (Harrison & Horne, 1999), and it damages the immune system (Glaser & Kiecolt-Glaser, 2009). Similarly, sleep troubles observed during work time which may increase accidents and incidents (Lauber & Kayten, 1988).

The study acquires its importance from the significance of clarifying The Impact of Sleep Quality in Aviation Employees' Performance as well as it gives scientific approach to cope with human factors issues which affect the aviation performance also it improves the relation between employees and their job in order to reduce the errors, increase accuracy, maximize the performance and efficiency, thus the work will stay within the safety regulation and continuing airworthiness demands. Study has been noted previously that sleep is a serious issue that may affect organization and

employee's performance (Aljawarneh & Atan, 2018). which may increase or decrease the efficiency of the work outcomes as well as the lack of sleep quality leads to stress the workers.(Johnson & Naitoh, 1974). Job Stress may lead to performance loss on a lot of tasks including, response time, short term memory and mood (Johnson & Naitoh, 1974). Similarly it could be a reason for daytime tiredness (Carskadon & Dement, 1979).

A Report was published in February 2013 by national transportation safety board (NTSB) about crashed plane; the final report was concluded that five passengers were killed due to pilot sleep loss which in turn contributed to this tragedy (Heffron, 2014). Furthermore, study was issued by National Sleep Foundation (NSF) about Correlation between sleep and work accidents reveled that lack of sleep may reduce effectively at work place, and it may make the work unsafe. As will as it was revealed that lack of sleep misted employees thinking and causes them to make more errors, react slower and worse conclusion. Than when they had good sleep quality (Aljawarneh & Al-Omari, 2018). The most unsafe characteristics of sleep lacking is that employees often miscalculate their own state of mind and energy, also they think they are able to make important decisions and tasks, but in fact they are can't(NSF, 2008). This study is going to examine the impact of sleep quality on IWG employees' performance also concentrate on job stress as mediator variable.

LITERATURE REVIEW

Sleep Quality

Aviation business organization spends much money on Aircraft maintenance, Aircraft operators, and training in order to insure perfect service for customers (Al-Omari, et al., 2020). This cost increase every year as with technology enters into the aviation organizations. Aviation employees' work as team work to back aircraft to the service with code one status in safe and airworthy otherwise aircraft will drift towards a level of undependability that may quickly loom competence and safety (Hobbs, 2008),to achieve this many serious arrangements and issues were applied (Warren, 2011). Human factors are one of most issues applied to the employees (Hobbs, 2008). In order to improve the relationship between the activates of them (Hawkins, 2017; Wise et al., 2016; Al-Omari, et al., 2018). in order to integrate that knowledge into the systems which designed to enhance safety, performance, reducing job stress Al-Jawarneh, 2016.Wise et al (2016) Study for Hawkins et al. revealed that many human factors affecting performance in next day's such as job stress, fitness, sleep quality, fatigue, time pressure, communications and training(Hawkins, 2017). Sleep is defined as a normal case of decreasing realization with improvement tin body and mind behavior which is essential to refurbish and reload the body and brain energy (EASA, 2018).

Sleep is an energetic, frequent and adjustable behavior helping several different tasks necessary for human beings so if body exposed for sleep loss or lack of sleep quality, it will lead to perform the several different task differently.(Benington, 2000; Krueger, 2003). Many employees go to their

work place with shortage in sleep amount. Specialist became worries about poor sleep cases between employees ,due to the critical relationship between sleep quality, and health(Vail-Smith, Felts, & Becker, 2009).The rule of life style happiness of affected by sleep quality (Mahafzah et al., 2020). For example, if sleep duration is changed from ten hours to four hours during only 12 Respectively days, bodily nervousness is increased and Social relations is declined gradually(Haack & Mullington, 2005),on the contrary good sleep quality for employees, will increase their performance and productivity, and make better management(Haack & Mullington, 2005). In addition, they will be evaluated, more positively by supervisors and more likely to show productive workplace activities (Lyubomirsky, King, & Diener, 2005).

Sleep quality is important for human beings to have healthy life (Siegel, 2005). The humans search for sleep as much as they are looking for food. And they spend about 33% of their lives in sleep (Siegel, 2005). Sleep is controlled by unlimited bodily mechanisms , so that although peoples can cope sleep and stay awake for a while, but the controller of wake patterns is restricted and extended for short periods and it will lead finally to sleep(Barnes, 2012). Various factors were identified related to sleep deficits such as demographics, health status, and jobs demands(Kubota et al., 2010).Several studies reported a score equal to 8 or higher on Pittsburgh sleep quality index which means indicate a sleeping disorder should be considered with attention(Feleke, Mulatu, & Yesmaw, 2015). Zamanian et al. conducted a survey on 1450 nurses working at 12 hospital using PSQI the study showed that 78% of nurses were poor sleepers on PSQI score for more than 5(Han, Yuan, Zhang, & Fu, 2016) the researchers claimed that this result due shift rotation and health status(Zamanian, Nikeghbal, & Khajehnasiri, 2016).

Siegel defines sleep as a case of flexibility with noticeable minimization in sensitivity, which differ from coma by its quick reversibility (Siegel, 2005). Sleep is considered as a rearrangements of nerve bodily system, that includes essential brain processes (Hobson, 2005). Whitmore et al. reveled that as Sleep quality is increasing, unintentional errors is decreasing (Whitmire et al., 2009). Studies show that 24 hours without sleeping may cause fatigue and increase negative performance (Banks, 2007; Durmer & Dinges, 2005;Harrison & Horne, 1998). As well complex tasks that require attention, conscious, memory recall , mental process ,speed, and fine functioning will be affected(Harrison & Horne, 1998). Moreover, the people who are impacted from bad sleep quality may not be able to accurately measure the amount of deficiency, so they will take wrong corrective action to alleviate this impacts (Bonnet, 1985). The good quality of Sleep is important in the recovery from work overload, by promoting worker health (Saper, Scammell, & Lu, 2005). Also its improve health, consequent economic costs by reducing employee absence, and reducing illness cases between employees (Goetzel et al., 2004).

When we say sufficient sleep quantity or good sleep quality , it means sleep hours in a given night was sufficient , while poor sleep quality or insufficient sleep quantity means many wake up times during night (Barnes, 2012). Also poor sleep quality can be understood through different concepts (Al-Da'abseh,

et al., 2018). One concept is sleep loss, which has been designated as a state of reducing sleep time capacity. such as to not sleep for long periods of time without stopping (Caldwell Jr, Caldwell, Brown, & Smith, 2004) or because of individual illness such as when sleep is controlled to six hours per night for two weeks (Van Dongen, Maislin, Mullington, & Dinges, 2003). Another concepts was showed by Elmenhorst et al .study's, which revealed that sleeping only five hours per night for four days may leads to symptoms similar to symptoms of a blood alcohol content of 0.6%(Elmenhorst et al., 2009). which means a small amounts of sleep lacking may result as negative performance (Barnes, 2012). Therefore, sleep quantity and quality could have similar effects on worker performance (Barnes, Schaubroeck, Huth, & Ghumman, 2011; Hursh et al., 2004). As well as , sleep employees job satisfaction directly affected by quantity and quality (Scott & Judge, 2006), Lacking or poor sleep quality and quantity are also a serious issue that could lead for job stress (Söderström, Jeding, Ekstedt, Perski, & Åkerstedt, 2012).

Sleep is a basic need, but till now its un known why we sleep although its phenomenon observed and different in duration between all creations (Hershner, 2020).while the impact of sleep quality on job performance attributes depends on sleep durations(Paruthi et al., 2016). the American academy of sleep medicine, advices even hours at least of nightly sleep for people, while the NSF commends 8–10 hours of sleep for younger (Hirshkowitz et al., 2015). In accordance with study published in USAir was showed that the less time employees are spending in sleeping is because more time that employees spent in their works even on non-workdays (Basner et al., 2007). Similarly people who sleep <6 hours per night have the longest work hours (Knutson, Van Cauter, Rathouz, DeLeire, & Lauderdale, 2010). The relationships between sleep quality and job are understudied but its known that employed people spend much of their time working or sleeping (Basner et al., 2007). Sleep quality directly proportional with employees performance, productivity, accuracy and affectivity (Daley et al., 2009) sleep quality is a direct cause for accidents and incidents(Lindberg, Carter, Gislason, & Janson, 2001). On other hand lack of Sleep quality adversely proportional with day performance, mental losses, and attitudes, as well as cause problems and increase argues with co-workers (Daley et al., 2009). Similarly, NSF carried out study in 2008, contained a national survey were conducted between employees to measure and express the commons factors between job and sleep quality, it was revealed that applicants who spend long hours in working would report less total sleep times, lesser job performance with sleepiness at work place (Alwagfi et al., 2020). also reported that employees with poorer sleep quality or short sleep times would also reported more negative job performance (NSF, 2008).

Job performances also inversely proportional with sleep loss which leads to increase fatigue, temper changes, and affect immune system of the human body(Harrison & Horne, 1999). One of the sleep troubles is sleepiness during activity time at work place which can result in increasing accidents and incidents (Lauber & Kayten, 1988).Sleep quality specialists highlight the impacts of sleep quality on people activity (Harrison & Horne, 2000) However

organizational behavior studies ignored the effects of sleep quality on work performance, but little research available on sleep and work demonstrates that sleep quality affects job performance (Barnes, 2012). For example, sleep deficiency leads to poor task performance (Kessler et al., 2012) and maximize the occurrence and harshness of work injury (Kling, McLeod, & Koehoorn, 2010).

Job Stress

Job stress is widely common working feature among all employees (Alshare et al., 2020). Job stress is the unsafe reaction and mental response that may occur when there is a conflict in matching between loaded job on the employee and the control policy were performed in organizations to meet demands (Ajayi, 2018). Job stress producing individual's reaction among job context which reduce employees' satisfactions (Newman & Beehr, 1979). Similarly, Robbins et al. always showed that job stress is a case where dynamic situation for employee is changed in which is confronted his opportunity, constraints or demand which is related to what employee desires (Robbins & Sanghi, 2006). as well De Beer et al. stated job stress is an increasing in organizations problems and often cause adverse effects on performance (De Beer & Swanepoel, 1998). also job stress, being defined as the employees feeling towards performance in his work place and his power until change un satisfied situation, (Luo, Hu, Xu, & Wang, 2018). Job stress happens due to bad management between employee time, job time, ambiguity at work, unsafe work place, bad employee relationships with others, methods of communication, quality and heavy load of tasks (Michac, 1997). Furthermore, mental, physical, chemical and organic causes at the job work place are the main real features that may leads to job stress (Najimi, Goudarzi, & Sharifirad, 2012). In 1992 United Nation (UN) stated that job stress will be the illness of 20th century and later. Furthermore, the international organization of labor, revealed that about 1% to 3.5% of national gross production may decreased due to job stress (al-Bourini et al., 2020). It has become notable in different researches that one third of labors developed countries have job stress disorder (Aghilinejad, Mohammadi, Afkari, & Abbaszade Dizaji, 2007).

Job Stress has three levels or stages: situations of work place (stressors) (Alsafadi et al., 2020). Employees talents' and experience as (work stress) and Effectiveness of expectations (strain) (Kahn & Byosiere, 1992). Stressors could be seen in duration and existing over longer periods of work time, e.g., months or even years (Hurrell Jr, Nelson, & Simmons, 1998). and might be lasting also more acute specific days or weeks (Sonnentag, 2001). In general Stressful work condition seems to produce a counterproductive of work performance (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Ganster & Schaubroeck, 1991). Importantly, quality of sleep troubles may symbolize stress indications (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011; Aljawarneh et al., 2020).

Job stress may be directly related with sleep quality of employees between different levels in work place (Deng, Liu, & Fang, 2020). Poor sleep quality, including disturbed sleep or inability to sleep well and poor sleep quality are

connected with a variety of negative concerns, such as health problems (Walsh, Benca, & Bonnet, 1999), also reduced quality of life and economic expenses (Lamberg, 2004). There are a number of theoretical clarifications for why job stress may be affected by quality of sleep, one of them Meijman & Mulder theoretical model which indicates that spending too much effort at work may lead to explicit load responses (Meijman & Mulder, 2013). which finally working on physiological changeable behavior for employees and may meet at the end with the job stress and lack of sleep quality symptoms (Sonnentag, 2001). In addition job stress impacts could damage psychology of employees, such as health, happiness, and performance those theories suggest that employees should be away from work stress to achieve expectations (Hobfoll & Wells, 1998). Poor Sleep quality harms employee by increasing potential job stress (Barber & Budnick, 2015). Barber et al. verified that sleepiness enhanced *people's* cognitive bias. In fact, they found that poor sleep quality enlarged negative outcomes. (Barber & Budnick, 2015). Poor of sleep quality may reduce affectivity (Barnes, 2012) and increase task-accomplishment procedures, also left fewer thinking resources that available to meet job stressors (Schmitt & Kuljanin, 2008). Poor sleeper employees have more upsetting from work place than better sleepers, even if situations stressors are still not changed (Morin, Rodrigue, & Ivers, 2003).

The sleep quality of employees has major effects on job stress (Lim & Dinges, 2010). It increases employees complications of muscle pain and headaches (Kuppermann et al., 1995). Similarly, there are great relationships among poor quality sleep and job stress accidents and incidents in the workplace (ÅKERSTEDT, 1995; Åkerstedt, Fredlund, Gillberg, & Jansson, 2002). the cost of these accidents may exceed \$50 billion annually (Leger, 1994). In particular, poor sleep quality is associated with lower job performance, absenteeism, and increased use of sick leave cases to run away from job stress (Linton & Bryngelsson, 2000).

Job stress is important because its reduced job productivity (Hoboubi, Choobineh, Ghanavati, Keshavarzi, & Hosseini, 2017). As well expressively reduced the employees' performance (Vijayan, 2017). Most of organizations are in the goal of attaining more productivity and ends up loading employees with more tasks to meet organization aims and this might have psychological and physical effects on the employees, which may result in something negatively to what organization goals (Monica & Ramanaiah, 2016). For instance, in industries, due to target pressure, loss of personal life, odd timings, decline in the employment, and competition, the employees suffer from more workloads and work for longer hours which could decrease in concentrations, increase in absence, hypertension, conflicts arises and peer pressure between employees (Monica & Ramanaiah, 2016). Job stress is one of the main factors which affect the employee's accuracy, and efficiency (Monica & Ramanaiah, 2016). High workload has become common in today's scenario that produced Job stress. Time pressure, shortage of suitable environment, inadequate resources to accomplish job and inefficient co-workers, will minimize the performance (Monica & Ramanaiah, 2016).

Job stress will translate into reduced performance levels, low optimism and maximize employee positions during work cycle in organizations (Dar, Akmal, Naseem, & din Khan, 2011). Quantity and quality of employee's performance are the main target for all organizations (Schermerhorn, Hunt, & Osborn). Job performance is the amount of work carried out by employees (Robbins & Judge, 2013). Moreover, the main factor of job performance depends on the demands of the job objectives, missions and beliefs created by organization (Befort & Hattrup, 2003). Positive job outcomes can have desirable consequences with some kinds of stress (Wu, 2011). Such as, when a stressor is estimated largely as a task it may lead to increase arousal and improved performance outcomes (LePine, Podsakoff, & LePine, 2005).

Although some researchers have explored that job stress and performance is either have progressive or destructive relationship, but most of them revealed that stress and performance relationships always destructive (Gilboa, Shirom, Fried, & Cooper, 2008). As well as effect functions of organization and its accuracy destructively connected (Wu, 2011). Most of time Energy spent by employees is wasted because of job stressor, and limited concentrations that performance will be affected (Siu, 2003). Job stress is a global problem, its cost Annually hundreds of billions of dollars around world (Liu & Spector, 2005). Job stress incompatible with the relaxed state of performance so where is job stress there is poor performance (Åkerstedt, 2006). Similarly, job stress time pressure and shift work interferes with sleep quality, all affect performance (Brosschot, Gerin, & Thayer, 2006; Petrilli, Roach, Dawson, & Lamond, 2006). Increasing motivation, coordination between employee expectations, aims of the organization, operative communication, trust, sufficient and correct working of the performance, evaluation system and high level of worker pleasure are directly proportional with job performance and inversely with job stress (YARDİBİ, 2018).

Employees' Performance

Performance is how good or bad people perform tasks. Based on literatures, performance definition has no standardized uniform (Banyhamdan et al., 2020). Krause defined Performance as how much objectives could be achieved of obtained or possible work accomplishment with respect to the important characteristics of an organization. (Krause, 2005). Tatjana Samsonowa, argues previous definition. She said performance had to be analyzed before defining since the definition has two terms: affectivity and efficiency. She uses the performance as the level of goals in work place, as a term effectiveness and degree of a goal performed by employees as a term efficiency (Samsonowa, 2011). From another viewpoint Van Dooren et al. said: performance has a quality levels that can be either high or low based on outcomes of tasks, performance is just results (Van Dooren, Bouckaert, & Halligan, 2010).

Researchers spent much time on defining, understanding, and calculating performance within job situations (Arvey & Murphy, 1998). Since 1980s, investigators have changed their effort away from technology issues toward increasing a well understanding to employees performance and their impression at organization (Arvey & Murphy, 1998). So to select perfect

employees, special procedures were carried out (Arvey & Murphy, 1998). They trying to find out the relationship between information processing , cognition and the real questions often asked by investigators(Landy & Farr, 1980; Newman, Kinney, & Farr, 2004). While most employees try to continue their lives by forcing their abilities and exceeding their limits in organizations to earn incomes, Job performance is playing a vital role in understanding the aims of organization (Altindag, 2020). While employees are trying to keep up with dynamic and rapid changes in working experience, at the same time, they are trying to meet administrative needs (Alzoubi et al., 2020). Various issues, such as relationships, interactions, behaviors, and the quality of management is going to be understand (Masa'd & Aljawarneh, 2020). Experienced in external and internal situation of the work place can lead employees, who perform specific roles and jobs within the organization, to face organizational stress (Altindag, 2020).

All approaches and actions that are controlled by an employee in work and which asses to reach the goals of the organization in termed of job performance (DEMİRER, 2019).The concept of job performance is defining to what extent the targeted job is completed, From employees view point , it's the whole of the behaviors exhibited by the employee from organization to reach its objectives (Tekin & Deniz, 2019). At work place it's all activities that employees involved in are called job performance (Altindag, 2020; KESKİN & GÜNDOĞAN, 2019).

According to Baytaş, all doings related to the work performed by workers were defined as job performance. Performance is the quality of employee' sway in doing the work. If employees do not have familiarity, skills, and capabilities for the work they will do, job stress will increase, and they will lose motivation, and their performance may decline(Baytaş, 2018). Job performance is a component of the task and appropriate performance, and it is the effort made by employees in order to achieve job objectives(Meydan, Dirik, & Eryılmaz, 2018). Job performance is ability of an employee to perform the objectives and organizational standards(Bin, 2015). The concept of job performance is interrelated to the existence of structures suitable for the requirements of the job, the employee's struggling for his/her job (willingness), and the presence of environmental features for the realization of the job(Koca & Yıldız, 2018).

Based on the research problem, and to answer the study questions, the researcher supposed the following hypothesis:

H01- *There is no statistically significant Impact for Sleep Quality on (IWG) Employees' Performance at level ($\alpha \leq 0.05$).*

H02- *There is no statistically significant impact for sleep quality on (IWG) Employees 'job stress, at level ($\alpha \leq 0.05$).*

H03- *There is no statistically significant impact for(IWG) Employees 'job stress on their performance at level ($\alpha \leq 0.05$).*

Methodology

Descriptive analytical technique will be used to evaluate study hypotheses by examining the associations between study variables through related data. Electronics questionnaire was used based on international scales to measure and test the hypothesizes as well as to answer the study questions. Population of the study included (IWG) employees; they were about (600) employee. An electronics questionnaire were conducted to most of IWG Employees – 246 questioners were collected electronically -who are working at (IWG). Participants were asked to complete an electronic questionnaire containing the Pittsburgh Sleep Quality Index (PSQI), Scale to Measure Individual Performance in Organization, Job Stress Scale to measure Job Stress, other demographic and lifestyle were developed by the researcher.

questionnaire paragraphs will bemeasured to insure thatvariables meet thetheir objectivity.Questionnaire was checked by two methods : content validity and face validity. Content validitycontains universal scales to mesure the validty of study variables and this were provided and provedthrough a lot of literatures such as books, articles, research papers, thesis, dissertations and companies' profiles. The second method is face validity whichwas presented to a number of interested academics to take their views,opinions and observations about questions were askedAppendix(C). Job stress scale to insure validity by using corrected Item-Total Correlation. Calculate the correlated correlation coefficients for Job stress scale using Correlation coefficient point Biserial for the correlation. The results are showed in the table. 3.2:

Table 3.2 The Corrected Item-Total Correlation for Job stress scale

Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation
1	.700	9	.825
2	.700	10	.570
3	.624	11	.783
4	.580	12	.790
5	.694	13	.659
6	.669	14	.729
7	.804	15	.320
8	.815		

The table (3.2) shows that the correlated correlation coefficients for the correlation for Job stress scale of each resolution paragraph to the dimension to which they belonged ranged from (0.320 and 0.815) Which are suitable correlation coefficients and indicate the validity of the construction using correlated correlation coefficients.

Calculating the correlated correlation coefficients for Performance scale using Correlation coefficient point Biserial for the correlation the results are showed in the table (3.3).

Table (3.3) The Corrected Item-Total Correlation for Performance scale

Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation
1	.328	19	.509
2	.458	20	.488
3	.350	21	.301
4	.344	22	.472
5	.470	23	.490
6	.332	24	.345
7	.313	25	.535
8	.359	26	.477
9	.314	27	.365
10	.377	28	.473
11	.396	29	.442
12	.319	30	.383
13	.460	31	.358
14	.321	32	.443
15	.375	33	.350
16	.498	34	.428
17	.407	35	.300
18	.331	36	.419

The table (3.3) shows that the correlated correlation coefficients for Performance scale of each resolution paragraph to the dimension to which they belonged ranged from (0.300 and 0.509) which are suitable correlation coefficients and indicate the validity of the construction using correlated correlation coefficients.

PSQItool were used to calculate variables level if the **IWG** employees have bad or normal sleep quality the result were as in table (3.4):

Table (3.4) sleep quality questionnaire results

VARIABLES	VARIABLES levels	Frequency	Percent
sleep quality	bad	154	62.6
	normal	92	37.4

Through conducting questionnaire, it can be notable the quantity of employees that have bad sleep quality, see figure (3.5).

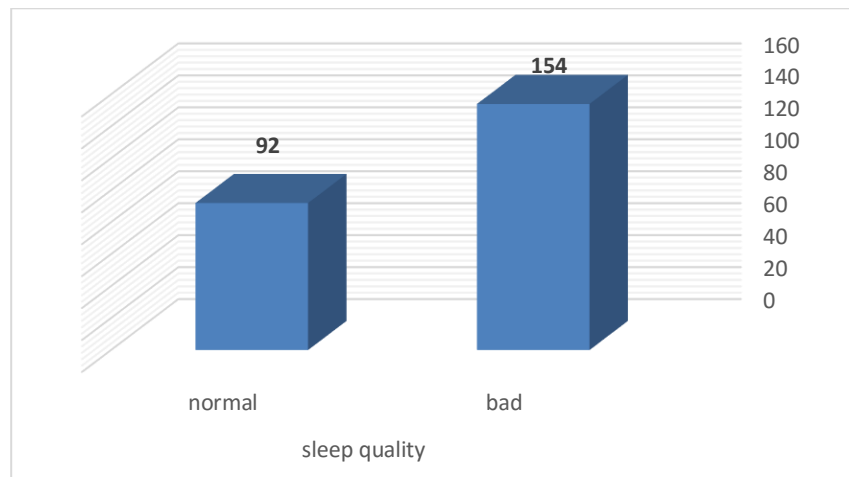


Figure (3.1) sleep quality questionnaire results

Job stress

The internal consistency coefficient of the study instrument was determined by calculating the mean correlation between the internal parts of the questionnaire for Job stress scale using the Cranach's Alpha scale come Job stress scale (0.938) and its high value indicates the degree of high reliability using internal consistency coefficient for Job stress scale.

The internal consistency coefficient of the study instrument was determined by calculating the mean correlation between the internal parts of the questionnaire for Performance scale using the Cronbach's Alpha scale. (Cronbach Alpha) Measures the consistency of respondents' responses to all paragraphs in the scale. The results are showed in table (3.5).

Table (3.5): The internal consistency coefficient using the Cronbach's Alpha for Performance scale

No.	Dimension	internal consistency coefficient
1	Handling Emergencies and Crises	0.782
2	Managing work stress	0.725
3	Solving Problems Creatively	0.786
4	Dealing with Uncertain and Unpredictable Work Situations	0.789
5	Training and Learning effort	0.832
6	Interpersonal Adaptability	0.791
7	Cultural Adaptability	0.787
	Performance	0.919

The sample for this study was 246 employees who are working at IWG; 41 pilots, 39 Engineers, 24 air hostess, 27 Administrative, 43 Instructor / Trainer, 52 Technicians, 20 other. Result is shown in table (4.1)

Table: (4.1) frequencies and percentage

VARIABLE	VARIABLES level	Frequency	Percent 100%
Job	Administrative	27	10.9
	Pilot	41	16.7
	Technicians	52	21.1
	Instructor / Trainer	43	17.5
	Air hostess	24	9.8
	Engineer	39	15.9
	Others	21	8.5

Based on PTQI score the result was 154 employees of total sample have bad / poor sleep quality as a percentage of 62.6%. While 92 employees have normal sleep quality as a percentage 37.4%. See table (4.2).

Table: (4.2) PSQI Score

VARIABLES	VARIABLES levels	Frequency	Percent 100%
Sleep Quality	Bad	154	62.6
	Normal	92	37.4

Descriptive Analyzing for Mediator Variable: Job Stress.

Table (4-3) shows the average means of Job stress for total mean score is (3.43) with a moderate level. In addition, the average means of Job stress for statement ranged between (3.29) and (3.59), and with moderate level. The statement, this is a relaxed place to work, came in the first order with an average mean of (3.59) and a moderate level. The statement, I feel like I never have a day off, came last, with the least average mean of (3.29) with moderate level.

Table (4-3) Means and Std. Deviation of the Job stress in descending order

No.	rank	Statement	Mean	Std. Deviation	Levels
15	1	This is a relaxed place to work	3.59	.981	moderate
3	2	My job gets to me more than it should	3.54	1.169	moderate
4	3	I spend so much time at work, I can't see the forest for the trees	3.54	1.094	moderate
2	4	Working here makes it hard to spend enough time with my family	3.50	1.153	moderate
6	5	Working here leaves little	3.50	1.045	moderate

		time for other activities			
10	6	I feel guilty when I take time off from job	3.45	.996	moderate
13	7	Too many people at my level in the company get burned out by job demands	3.45	1.016	moderate
5	8	There are lots of times when my job drives me right up the wall	3.40	1.204	moderate
1	9	I have felt fidgety or nervous as a result of my job	3.39	1.273	moderate
9	10	I have too much work and too little time to do it in	3.39	1.074	moderate
11	11	I sometimes dread the telephone ringing at home because the call might be job-related	3.39	1.140	moderate
8	12	I frequently get the feeling I am married to the company	3.37	1.109	moderate
7	13	Sometimes when I think about my job I get a tight feeling in my chest	3.35	1.062	moderate
14	14	I don't have enough time to develop my people	3.35	1.069	moderate
12	15	I feel like I never have a day off	3.29	1.115	moderate
		Job stress	3.43	.806	moderate

Descriptive Analyzing for Dependent Variable: Performance

Table (4.4) shows that the average means of performance for total mean score (3.36) with a moderate level. In addition, the average means of performance for statement ranged between (2.07) and (3.75), and with high, moderate and low level respectively. The statement, I adjust my work practices if someone points out a better solution, came in the first order with an average mean of (3.75) and a moderate level. The statement, I analyze possible solutions and their ramifications quickly to select the most appropriate one, became at last, with the least average mean of (2.07) with low level.

Table (4.4) Means and Std. Deviation of the Performance

No.	rank	Statement	Mean	Std. Deviation	Levels
1	32	I am able to achieve total focus on the situation to act quickly	3.11	.904	moderate
2	36	I analyze possible solutions and their ramifications quickly to select the most appropriate one	2.07	1.375	Low
3	19	I quickly decide on the actions to take to resolve the problem	3.40	1.020	moderate
4	27	I am not in a position to be able to respond quickly	3.20	1.146	moderate
5	25	I can only work efficiently in a comfortable environment	3.24	1.118	moderate
6	8	I sometimes reach my physical limits to accomplish an urgent task	3.61	1.043	moderate
7	34	I feel at ease even if my tasks change and occur at a very fast pace	2.83	1.059	moderate
8	2	I keep my cool in situations where I am required to make many decisions	3.69	.905	High
9	22	Having to take on additional work unexpectedly makes me very anxious	3.33	1.069	moderate
10	21	I look for solutions by having a calm discussion with colleagues	3.37	.897	moderate
11	26	Work-related stress impacts the quality of what I do	3.23	.939	moderate
12	23	My colleagues ask my advice regularly when situations are difficult because of my self-control	3.30	1.014	moderate
13	11	I do not hesitate to go against established ideas to propose an innovative solution	3.58	.862	moderate
14	17	I use a variety of sources/types of information to come up with an innovative solution	3.49	.972	moderate
15	33	Whatever the problem to be	3.00	1.099	moderate

		solved, I never use anything but well-known methods			
16	6	I develop new tools and methods to resolve new problems	3.62	.904	moderate
17	14	Within my department, people rely on me to suggest new solutions	3.55	.919	moderate
18	28	I wait for more accurate information from my superior before acting	3.19	1.118	moderate
19	16	I easily reorganize my work to adapt to the new circumstances	3.53	.933	moderate
20	9	I contribute to the stability of my team by driving others towards our priority assignments	3.59	.870	moderate
21	24	Uncertain or unpredictable work situations impair my ability to act	3.25	.981	moderate
22	5	I am on the lookout for the latest innovations in my job to improve the way I work	3.63	.954	moderate
23	10	I undergo training on a regular basis at or outside of work to keep my competencies up to date	3.59	1.021	moderate
24	35	I wait for the innovations having to do with my job to become widespread in the company before I put major effort into relevant training or learning	2.81	1.038	moderate
25	3	I prepare for change by participating in every project or assignment that enables me to do so	3.66	.906	moderate
26	4	I look for every opportunity that enables me to improve my performance (training, group project, exchanges with colleagues, etc.)	3.65	1.050	moderate
27	29	I adapt my work practices to the requirements and suggestions of others	3.15	1.094	moderate
28	20	I do not consider negative comments about my work	3.40	1.012	moderate

		very important			
29	1	I adjust my work practices if someone points out a better solution	3.75	1.011	High
30	7	Developing good relationships with all my counterparts is an important factor of my effectiveness	3.62	1.014	moderate
31	18	I try to understand the viewpoints of my counterparts to improve my interaction with them	3.48	1.053	moderate
32	12	I learn new ways to do my job in order to collaborate better with others.	3.58	.973	moderate
33	30	I frequently feel awkward because of problems in understanding the work practices of others	3.13	1.093	moderate
34	15	I willingly adapt my behavior whenever I need to in order to work well with others	3.54	.879	moderate
35	13	Whatever the situation, I like to stay with my own work practices and act based on my own principles of cooperation	3.57	.949	moderate
36	31	I strive to adapt, however difficult, to the working conditions I am in	3.12	1.100	moderate
		Performance	3.36	.379	moderate

Similarly, for all Dimensions of performance, table (4.5). Shows that the means of performance for total mean score (3.36) with a moderate level. In addition, the average means of Performance for Dimension ranged between (3.10) and (3.48), and with moderate level. The Dimension, Interpersonal Adaptability, came in the first order with an average mean of (3.48) and a moderate level. The statement, Handling Emergencies and Crises, came last, with the least average mean of (3.10) and a moderate level.

Table (4.5) Means and Std. Deviation of the Performance Dimension

No.	rank	Dimension	Mean	Std. Deviation	Levels
1	8	Handling Emergencies and Crises	3.10	.549	Moderate
2	6	Managing work stress	3.29	.445	Moderate
3	3	Solving Problems	3.45	.586	Moderate

		Creatively			
4	5	Dealing with Uncertain and Unpredictable Work Situations	3.39	.582	Moderate
5	2	Training and Learning effort	3.47	.633	Moderate
6	1	Interpersonal Adaptability	3.48	.639	Moderate
7	4	Cultural Adaptability	3.45	.580	Moderate
8	7	Physical Adaptability	3.12	1.100	Moderate
		<i>Performance</i>	3.36	.379	Moderate

To answer this question; means, standard deviations and "T" test for independent samples were calculated to examine the significance of differences in performance according to sleep quality. Table (4.6) shows result:

Table (4.6):Means and Std. Deviation and "T" test for independent samples of the Performance according to sleep quality

Sleep Quality	N	Mean	Std. Deviation	t	df	Sig.
bad	154	3.21	.335	-9.123	244	.000*
normal	92	3.60	.316			

* Statistically significance at ($\alpha = 0.05$).

Table (4.6) shows that there are statistically significant variances in the Employees' Performance. The (T) value for Performance according to sleep quality (-9.123), which statistically significant at ($\alpha = 0.05$). Therefore, there are statistically significant differences in the Employees' Performance according to sleep quality. The differences were in favor of the Employees' how had normal sleep quality, this indicates that Employees' with normal sleep quality performed better than bad sleep quality.

In order to test whether these statistically significant Impact of Sleep Quality on (IWG) Employees' Performance at level ($\alpha \leq 0.05$), Logistic Regression test was applied. The results are presented in Tables (4.7):

Table (4.7): Classification of Predicted without explanatory variables of the Performance according to sleep quality

		sleep quality score		Percentage Correct
		bad	normal	
Sleep Quality score	bad	154	0	100.0
	normal	92	0	.0
				62.6

Table (4.7) designates the baseline model, this model does not include our explanatory variables, the predictions of this baseline model are made purely on whichever category occurred most often in our dataset. the overall percentage row tells us that this approach to prediction is correct 62.6% of the

time.

Table (4.8): designates the baseline model, this model does include our explanatory variables, the calculations of this baseline model are made only from category occurred most often in our dataset. Its notable that model is correctly now also classifying the outcome for 77.6% of the cases compared to 62.6% in the null model.

Table (4.8): Classification of Predicted with explanatory variables of the Performance according to sleep quality

		sleep quality score		Percentage Correct
		bad	normal	
Sleep Quality score	bad	133	21	86.4
	normal	34	58	63.0
				77.6

Now in accordance with regression model that includes our explanatory variables. The next set of table (4.9) starts with the heading of Enter Method.

Table (4.9): Tests of Model Coefficients of the Performance according to sleep quality

	Chi-square	df	Sig.
Step	86.691	1	.000*
Block	86.691	1	.000*
Model	86.691	1	.000*

* Statistically significance at ($\alpha = 0.05$).

This table shows that chi-square values was statistically significance, that mean there is a significant variance between the Log-likelihoods of the baseline model and the new model which indicates the accuracy of the model.

when explanatory variables added totes impact and variables in the Equation of Sleep Quality on (IWG) Employees' Performance. The results are presented in Table (4.10):

Table (4.10): Impact and Variables in the Equation of Sleep Quality on (IWG) Employees' Performance

	B	S.E.	Wald	df	Sig.	-2Log likelihood	Nagelkerke R Square
Performance	4.902	.684	51.388	1	.000*	238.541	.405
Constant	-17.289	2.365	53.421	1	.000		

* Statistically significance at ($\alpha = 0.05$).

This table shows the model summary values for the full model. The -2LL value for this model (238.541) and Wald coefficients for Performance of Sleep

Quality (51.388) was significantly decreased in the -2LL, this means that our new model (with explanatory variables) is significantly better fit than the null model. In addition, it means that performance at work is influenced by the quality of sleep, as employees with normal sleep quality performed better than employees with bad sleep quality. To know the amount of impact the Nagelkerke R² was (0.405) which suggests that the model explains roughly 40.5% of the variance in the outcome this means the 40.5% of the variance of performance could be explained from sleep quality for normal sleep.

There is a no statistically significant Impact of Sleep Quality on (IWG) Employees' Job Stress at level ($\alpha \leq 0.05$).

To answer this question, means, standard deviations and "T" test for independent samples were calculated to examine the significance of differences in Job Stress according to sleep quality; table (4.11) shows the result:

Table (4.11): Means and Std. Deviation and "T" test for independent samples of the Job Stress according to sleep quality

Sleep Quality	N	Mean	Std. Deviation	t	df	(Sig.)
Bad	154	3.94	.251	21.389	244	.000*
Normal	92	2.59	.709			

* Statistically significance at ($\alpha = 0.05$).

Table (4.11) shows that there are statistically significant differences in the Employees' Job Stress. The (T) value for Job Stress according to sleep quality (21.389), which statistically significant at ($\alpha = 0.05$). Therefore, there are statistically significant differences in the Employees' Job Stress according to sleep quality. The differences were in favor of the Employees' how had bad sleep quality, this indicates that Employees' with bad sleep quality Job Stress more than normal sleep quality.

In order to test whether these statistically significant Impact of Sleep Quality on (IWG) Employees' Job Stress at level ($\alpha \leq 0.05$), Logistic Regression test was applied. The results are presented in Tables (4.12).

Table (4.12): Classification of Predicted without explanatory variables of the Job Stress according to sleep quality

		sleep quality score		Percentage Correct
		bad	normal	
Sleep Quality score	Bad	154	0	100.0
	normal	92	0	.0
				62.6

Table (4.12) designates the baseline model, this model does not contain our explanatory variables, the calculations of this baseline model are made purely on category occurred most often in our dataset. The overall percentage row tells us that this approach to prediction is correct 62.6% of the time.

Table (4.13): Classification of Predicted with explanatory variables of the Job Stress according to sleep quality

		sleep quality score		Percentage Correct
		bad	normal	
Sleep Quality score	bad	153	1	99.4
	normal	12	80	87.0
				94.7

Table (4.13) describes the baseline model, this model includes our explanatory variables, the predictions of this baseline model is made purely on which category occurred most often in our dataset. As see the model is correctly now also classifying the outcome for 94.7% of the cases compared to 62.6% in the null model.

Now we move to the regression model that include our explanatory variables. The next set of tables begins with the heading of Enter Method:

Table (4.14): Tests of Model Coefficients of the Job Stress according to sleep quality

	Chi-square	df	Sig.
Step	232.502	1	.000*
Block	232.502	1	.000*
Model	232.502	1	.000*

* Statistically significance at ($\alpha = 0.05$).

Table (4.14) shows that chi-square values was statistically significance, that means there is a significant variance between the Log-likelihoods of the baseline model and the new model which indicates the accuracy of the model improved, when explanatory variables added to test impact and Variables in the Equation of Sleep Quality on (IWG) Employees' Job Stress. The results are presented in Table (4.15):

Table (4.15): Impact and Variables in the Equation of Sleep Quality on (IWG) Employees' Job Stress

	B	S.E.	Wald	df	Sig.	-2 Log likelihood	Nagelkerke R Square
Job Stress	-6.984	1.142	37.430	1	.000*	92.731	.834
Constant	24.189	4.171	33.636	1	.000		

* Statistically significance at ($\alpha = 0.05$).

Table (4.15) shows the model Summary values for the full model. The -2LL value for this model (92.731) and Wald coefficients for Job Stress of sleep Quality (37.430) was a significant decrease in the -2LL, i.e. that our new model (with explanatory variables) is significantly better fit than the null model. That mean that Job Stress at work is influenced by the quality of sleep,

as employees with bad sleep quality performed better than employees with bad sleep quality. To know the amount of impact the Nagelkerke R² was (0.834) which recommends that the model explains roughly 83.4% of the variance in the outcome that mean the 83.4% of the variance of Job Stress can explain from sleep quality for bad sleep.

Table(4.16) shows impact and variables in the Equation of Sleep Quality on (IWG) Employees' Job Stress and performance.

Table (4.16) Impact and Variables in the Equation of Sleep Quality on (IWG) Employees' Job Stress and performance

	B	S.E.	Wald	df	Sig.	-2 Log likelihood	Nagelkerke R Square
Job Stress	-8.182	1.566	27.286	1	.000*	92.731	.834
Performance	5.914	1.470	16.178	1	.000*	68.275	.884
Constant	8.591	5.343	2.585	1	.018		

* Statistically significance at ($\alpha = 0.05$).

This table shows the model Summary values for the full model. The -2LL value model for Job Stress (92.731) and Wald coefficients for Job Stress of Sleep Quality (27.286) and The -2LL value for this model for performance (68.275) is and Wald coefficients for performance of Sleep Quality (16.178) is significantly more better acceptable than the null model.

That mean employees with bad sleep quality have high job stress and low performance, and that mean the employees with normal sleep quality have low job stress and good performance.

To answer this question, the Pearson correlation coefficient between Job Stress and performance in IWG Employees' was calculated the results in table (4.17).

Table (4.17): Pearson correlation coefficient between Job Stress and performance in IWG Employees'

Performance	Job Stress
Pearson Correlation	-.427-**
Sig. (2-tailed)	.000
N	246

** Statistically significance at ($\alpha = 0.01$).

This table shows the Pearson correlation coefficient among Job Stress and performance in IWG Employees' was (-0.427) which statistically significant at ($\alpha = 0.01$). The relationship is negative, which means increasing in Job Stress leads to a decrease in performance in IWG Employees'. On the contrary, decreasing in Job Stress leads to an increase in performance in IWG Employees'. To find out the impact of Job Stress in IWG Employees' performance, analyzing by linear regression test was used, table (4.18) shows results:

Table (4.18) linear regression Coefficients of Job Stress in IWG Employees' performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R ²	F	p
		B	Std. Error	Beta						
Performance	Constant	4.045	.096		42.187	.000*	.427	.182	54.421	.000*
	Job Stress	-.201-	.027	-.427-	-7.377-	.000*				

* Statistically significance at ($\alpha = 0.05$).

Table (4.18) shows the results of simple linear regression for the impact of Job Stress in IWG Employees' performance. The f value (54.421) was significant because the related p value (0.000) was statistically significant (< 0.05). The beta coefficient reflects the impact value in the independent variable. It was (0.427-) and significantly contributes to the dependent variable as the probability of t statistics was (0.000) < 0.05 . The t statistics tests the linearity importance of the beta coefficient obtained for the independent variable. That mean there any statistically significant data for the Job Stress in IWG Employees' performance.

The value of R^2 expresses the prediction strength of the dependent variable (performance) using the independent variable (Job Stress) it was found to be (0.182) and this value mean the independent variable (Job Stress) impact (18.2 %) of variance on the dependent variable (performance) in IWG Employees'.

RESULTS' DISCUSSION

In my study, results show that 62.6% of participants have bad sleep quality. Similarly, a study carried out among airline pilots(Pellegrino et al., 2019).Showed that 48.2%. of 1234 airline pilots filled out an online questionnaire had Poor sleep quality with high frequency of technical delays, also a study carried out among Female Flight Attendants in china, it showed 59.9 % participants had bad sleep quality(Chung & Chung, 2009).

Furthermore, there were few studies about aviation employees' that focus on sleep quality but there were a lot of studies concentrate on medical and academic fields. For instance, a study about impact of sleep quality on academic performance carried out in Saudi Arabia(Alotaibi et al., 2020) showed that 77%ofstudentshad bad sleep quality, similarly, international studies had been done in United States, it showed that 50.9% had bad sleep quality, in the same field 55.8% in Ethiopia(Lemma, Gelaye, Berhane, Worku, & Williams, 2012).also 19% in China, and 40% in Lithuania (Azad et al., 2015). In medical sector, a study carried out Among Prehospital Providers (Patterson et al., 2010). Showed that 62% had bad sleep quality. Also another about medical staff treating patients with corona virus disease (COVID-19), the findings from this study showed that the sleep quality of the medical staff was low with a mean PSQI score of 8.583 for all participants(Xiao et al., 2020). Job stress was measured by Parker and DeCotiis (Parker & DeCotiis, 1983). in this study the standard deviation and mean are (0.806, 3.43) respectively, which indicates moderate effect. the average means of Job stress for total mean score is (3.43) with a moderate level. As well as Job stress mean for all statements, ranged between (3.29, 3.59) respectively, also with moderate effect.

The impact of sleep quality on job stress was statically performed – between PSQI score and Parker and DeCotiis scale –the result showed there was Statistically significance at ($\alpha = 0.05$).

Up to researcher knowledge measuring the statistical effect by using PSQI score and Parker and DeCotiisscale didn't performed before even in aviation field, but Parker and DeCotiis scale used a lot of time to measure the impact of

life style on employees' job stress. For example, a study about relationships between job stress and employee behaviors among organizations operating in the telecom and banking sectors in Islamabad, Pakistan (Syed, Naseer, & Bouckennooghe, 2020). the result showed there was Statistically significance at ($p < 0.05$). A study measure the impact of poor sleep quality on job stress among full time workers in USA (Knudsen, Ducharme, & Roman, 2007).but was used different scale to measure the relationship between job stress and sleep quality, were adapted from Karasek scale (Karasek Jr, 1979)., revealed that there were Statistically significance at ($p < 0.05$).

As well as international study about Problems with Working Fixed and Rotating Shifts between nurses. the result showed there was statistically significance at ($p < 001$) as a result of job stress due rotating shift between workers (Glazer, 2005). Similarly, A study examined the relationship of job stress and sleep pattern in industrialized countries, during the past two decades, it revealed there was great relationship between job stress and sleep habits and was statistically significance at ($p < 001$). (Jamal, 2005).

Similarly, performance was tested using the new adaptive scale which improved by Charbonnier- Voirin & Roussel (2012). Before testing the relationship between sleep quality and performance, the result of this study showed that the average means of Performance for total mean score (3.36) with a moderate level. And the average means of Performance for statements ranged between (2.07) and (3.75), and with high, moderate and low level respectively. But for all Dimensions of performance, the result showed that The average means of Performance for total mean score (3.36) with a moderate level. And the average means of Performance for Dimension ranged between (3.10, 3.48) respectively, with moderate level.

CONCLUSION

The study aimed to investigate the impact of sleep quality on IWG aviation employees' job stress and their performance. My study showed that the sleep quality of employees was poor which made their performance to be decreased. Also study was revealed that job stress has inversely affects to employee's performance. Furthermore, performance level degraded During emergency and other highly challenging situations. As well as a sectors like aviation performance may lead to accidents and fatalities.

RECOMMENDATIONS

Recommendations for international wing group (IWG): Give attention for human factors issues. Distribute questionnaires from time to time to give feedback about employees' job satisfactions. Monitor employees' performance accurately. Put the employees at ease as possible. Advise employees, specially pilots, crews and engineers to have good sleep quality. And explains the side effect of poor sleep quality to them. Hold meetings to explore their significant job for raising the morals.

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