INVESTIGATION OF MENTAL WORKLOAD AND JOB SATISFACTION AMONG OFFICE WORKERS AT A SELECTED ELECTRONIC COMPANY

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FACULTY OF ENGINEERING
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INVESTIGATION OF MENTAL WORKLOAD AND JOB SATISFACTION AMONG OFFICE WORKERS AT A SELECTED ELECTRONIC COMPANY

ABSTRACT

This study investigated the level of mental workload and job satisfaction among office workers at a selected electronic company in Subang Jaya. 103 professional workers from various departments comprising 54 males and 49 females participated in this study. DASS-21, Carga Mental Questionnaire, and Job Satisfaction Survey were used to gather data from the participants. Socio-demographic data were collected from participants too. The results showed mental workloads level is low among the workers while the level of job satisfaction is average. However, the level of stress among female workers is mild which is slightly higher than males. There are significant correlations between age of workers and mental workloads (CarMen-Q) based on statistical analysis. The age of workers positively correlates with performance demands, cognitive demands, and emotional demands in this organization except for temporal demands. The relationship between job satisfaction and mental workloads was evaluated using SPSS software to find the correlations. Additionally, there are opportunities for improvement by top management to conduct campaigns and programs to increase awareness on mental health and to review current job grade, compensation and benefits packages for improvement of job satisfaction (related to promotion, operating conditions, contingent rewards, and fringe benefits).

Keywords: mental workloads, job satisfaction, office workers, CarMen-Q, DASS-21

SIASATAN BEBANAN KERJA MENTAL DAN KEPUASAN KERJA DI KALANGAN PEKERJA-PEKERJA PEJABAT DI SYARIKAT ELEKTRONIK TERPILIH

ABSTRAK

Kajian ini mengkaji tahap bebanan kerja mental dan kepuasan kerja di kalangan pekerja pejabat di sebuah syarikat elektronik terpilih di Subang Jaya. 103 pekerja profesional dari pelbagai jabatan yang terdiri daripada 54 lelaki dan 49 wanita telah mengambil bahagian dalam kajian ini. DASS-21, soal selidik Carga Mental, dan tinjauan kepuasan kerja digunakan untuk mengumpulkan data daripada para peserta. Data sosio-demografi dikumpulkan daripada peserta juga. Hasil kajian menunjukkan tahap bebanan kerja mental rendah di kalangan pekerja sementara tahap kepuasan kerja adalah sederhana. Walau bagaimanapun, tahap tekanan di kalangan pekerja wanita adalah sederhana yang mana lebih tinggi sedikit daripada lelaki. Terdapat hubungan yang signifikan antara usia pekerja dan bebanan kerja mental (CarMen-Q) berdasarkan analisa statistik. Usia pekerja berkorelasi positif dengan tuntutan prestasi, tuntutan kognitif, dan tuntutan emosi dalam organisasi ini kecuali tuntutan sementara. Hubungan antara kepuasan kerja dan bebanan kerja mental dinilai menggunakan perisian SPSS untuk mencari korelasi. Selain itu, ada peluang untuk diperbaiki oleh pihak atasan untuk menjalankan kempen dan program untuk meningkatkan kesedaran mengenai kesihatan mental dan mengkaji gred pekerjaan, pakej pampasan dan faedah semasa untuk peningkatan kepuasan kerja (berkaitan dengan kenaikan pangkat, keadaan operasi, ganjaran luar biasa, dan faedah tambahan).

Kata kunci: beban kerja mental, kepuasan kerja, pekerja pejabat, CarMen-Q, DASS-21

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CarMen-Q	:	Carga Mental Questionnaire

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CHAPTER 1: INTRODUCTION

1.1 Background

Rapid technological change, the growth of automated systems, and new tools and equipment have reduced the pressure on workers in certain occupations, but not all. In addition, multiple professions can be psychologically and physically reliant on different levels (Ozkan, Ozdevecioglu, Kaya, & Koç, 2015). There are various adverse effects of development enhancement, such as fatigue, psychological stresses, work-related musculoskeletal problems, and apathy due to increased output or demand at the workplace (Bagheri & Ghaljahi, 2019). In addition, changes in the workload can affect the long-term satisfaction of the worker (Wahyudi, Zuraida, & Pangestu, 2018). In view of the current Industrial Revolution 4.0 (IR 4.0) situation, there is a significant obstacle to human-system interaction. For most organizations, most activities for skilled employees are unique, with varying degrees of complexity or difficulty. Knowing the mental workload of employees would also be helpful for the company to plan an acceptable role for its employees.

1.2 Scope of study

This research focuses on a group of workers employed in a selected electronic company. Research is conducted based on random sampling with inclusion criteria has been performed by skilled level staff with at least one year of total length of service and no fewer than 8 hours of computer work in a day. Exclusion requirements are current medical conditions, such as sickness or pain in some part of the body. Basic demographic information, such as age, gender, and total length of service, will be collected from employees. The data collection tools include a mental load questionnaire (Carga Mental Questionnaire and Depression, Anxiety, and Stress Scale (DASS-21) questionnaire. Lastly, the job satisfaction level will be assessed using Likert scale survey questions.

1.3 Problem statement

Several researchers have studied the significance of evaluating mental workload and job satisfaction. Studies have found that the health and wellbeing of workers are influenced by psychological factors such as workload, mental stress, interpersonal relationships, job satisfaction, and job security. (Rubio-Valdehita, López-Núñez, López-Higes, & Díaz-Ramiro, 2017).

Nevertheless, there has been limited research on psychological factors among other occupational groups working in the office setting. Work-related stress may occur when there is an imbalance in the workload and the capacity of workers. The lack of adequate action to manage the mental workload at the workplace has increased the mental health issues among employees and the inadequate management of the mental workload by the company for the implementation of appropriate controls at the workplace. Besides, job satisfaction can be assessed by considering relevant aspects of the worker's needs and expectations.

The employer must, therefore, play its role in helping workers to provide the right tools to recognize the problems that occur at the workplace. The findings of the workload investigation must be reported to top management and the execution of corrective steps should be tracked and documented appropriately.

1.4 Objective of the study

The purpose of this study was to identify mental workload and stress levels on professional workers during their usual day-to-day work and to determine job satisfaction levels among the workers working in an office environment at a selected electronic company. An additional aim was to propose recommendations for improvement to the top management pertaining to the result of this study.

1.5 Significant of the study

The mental health issue is a major public health concern all over the world. In 2015, Chairman of NIOSH Malaysia, Tan Sri Lee Lam Thye has reminded all organizations to focus on work-related stress as it will negatively impact workers' performance. Parallel to that, NIOSH has brought up concern on psychosocial risk amongst workers. It also has been classified as one category of health risks in a place of work. On a different note, NIOSH also reported that workers working with computers are prone to mental health problems. Most of people spend more than 8 hours daily at the workplace but there is still lack of mental workload investigation at the workplace. According to the Malaysian Mental Healthcare performance report, it is stated that 29.2% occurrence of mental health problems among adults in 2011, and the number is increasing. Additionally, the prevalence of depression was 1.8% and most cases were reported in the urban area. This should be an awake up call for all employers to start addressing work-related stress. Moreover, studies on mental workloads are still lacked in Asian countries especially in Malaysia. I hope to raise awareness among colleagues about mental health problems at the workplace by conducting this study.

CHAPTER 2: LITERATURE REVIEW

Since its inception in the nineteenth century, the office setting has changed greatly, where only administrative task is involved before (Shobe, 2018). It has now become a modern office setup with a light-touch keyboard, a flat-screen, and a well-built mouse from an easy workstation setup, where employees use a typewriter (K & Babu T, 2017). Looking at the latest growth of Industrial Revolution 4.0 (IR 4.0), it has facilitated the increased number of workers working in the office setup (Kang et al., 2016). Some of the activities for skilled employees in most companies like the electric and electronics industries are unique and have different levels of difficulty or challenges. Therefore, the company needs to establish a suitable role for its employees by considering physical and mental workloads including the stress level of employees.

The workload is directly related to demand levels and can go beyond decision-making and human cognitive abilities (Morales et al., 2020). It is very important for a worker to be able to process the information and produce an output of a given task. Furthermore, when a worker gets familiar with a job, the workload experienced will change according to the job elements. Related job elements include workers' effort, workers' stress, and the job itself (Miranda et al., 2018).

K & Babu T (2017) described that the cognitive risk factors have various effects, particularly on the office workers' efficiency. Additionally, Ozkan et al., (2015) have indicated that, given the working environment, different professions will have different mental and physical requirements. The consequences of fatigue, psychological pressures, work-related musculoskeletal dysfunction, and apathy arising from increasing demands at the place of work (Bagheri & Ghaljahi, 2019). Fan & Smith (2017) also discussed that physical demands have been reduced by technology enhancement while it increased workers' cognitive demands. Furthermore, changes in workload could have long-term

effects on employee satisfaction (Wahyudi et al., 2018). Developing a suitable work system by considering feedbacks and inputs from workers and appropriate data collection is an integral part of identifying real workplace issues. The use of the latest technology alone may not solve certain issues at the workplace.

2.1 Investigating Mental Workload at Workplace

Mental workload study has become a progressively significant subject after it was introduced within ergonomics in the 1980s (Young et al., 2015). Stanton & Young (2005) reported that mental workload signifies "the level of attentional resources needed to fulfill both objective and subjective criteria of performance, which may be mediated by task demands, external support and experience" or in plain terms when is a difference between skill sets and demands (Young et al., 2015). Input loads such as workers effort (as inputs), work performance (as an output), duration, and task load, are three related components of mental workload (Fan & Smith, 2017).

An employer can provide state-of-the-art equipment, but the desired result requires at least the worker's efforts. Many considerations that must be adequately taken into account before mental workload calculation is not as straightforward as the measurement of physical workload. Physiological, procedural, and perceptual or subjective methods are three different methods in measuring mental workload. More objective and accurate measurement can achieve from physiological and procedural methods but it was reported that subjective measurement is easier, economical, and less invasive. (Safari et al., 2013).

It is not just the overload conditions that restrict the mental workload. Brookhuis & de Waard (2010) considered that sub-optimum workload could be either overloaded or underloaded. Wilson and Rajan (1995) reviewed that, just like overloaded conditions, underloaded conditions can effect workers' performance (p. 208 as quoted in Salmon et al., 2009). Therefore, when the mental workload is reduced, it will not help to boost job

efficiency but the opposite may be true (Young et al., 2015). According to Brookhuis & de Waard (2010), overloaded and underloaded conditions cause errors, reduced concentration and alerts, and interruption, averting attention, and problems with the process of information. An appropriate workload range should be considered by the employer for a position or task. Workers may not realize their conditions until they are impaired by circumstances of underload or overload. Of this reason, several items should be evaluated well before an employer creates a work, especially when the criteria of cognitive skills are high. It should include proper steps because different employees have different skills and abilities needed to do the job. Single-handed jobs should be avoided too because it leaves workers frustrated and demotivated. A task should be built for employees to achieve the desired results flexibly and objectively.

Throughout the early days, the measurement of workload is minimal and limited to a certain profession such as pilots. More mental workload studies were subsequently performed for other professions such as train controllers, air traffic controllers, and car drivers. Researches on roles of office automation and adaptive job design were carried out in order to improve job satisfaction in the 1990s (Young et al., 2015). Yet, study on mental workload assessment for office workers especially in the electrical and electronic industry still inadequate.

2.2 Carga Mental Questionnaire (CarMen Q)

It is necessary to use a particular tool to quantify mental workload, rather than using a standardized instrument for an overall measurement of workload. Carga Mental Questionnaire (CarMen-Q) is a newly developed instrument by researchers from Spain to assess and diagnose the mental workload. The limited practical relevance of the performance dimension of NASA-TLX was observed due to the influence of variations in physical load as reviewed by DiDomenico & Nussbaum (2011). As a result, CarMen-

Q improved that dimension and excluded items related to the physical aspects of the task to determine the actual mental workload. It focuses on four dimensions that include cognitive, temporal, emotional / health, and performance requirements (Rubio-Valdehita et al., 2017). Mental workload evaluation popularity has increased significantly today compared to 20 years ago. Most of the time, evaluations of all job elements may not be needed. Moreover, it has become a necessity for most organizations, regardless of any industry, to check on mental workload as part of business ethics needs. A straightforward tool would help the employer to use with less or zero interruption of daily operations.

2.3 Depression, Anxiety and Stress Scale (DASS-21)

Depression is a serious mental health problem in the population at large. Depression has been reported to be dominant in the workforce and is associated with a significant loss of productivity (Simon et al., 2001). Lovibond and Lovibond developed Depression, Anxiety and Stress Scale in 1995 whereby it is a promising tool with great clinimetric characteristics for assessing the symptoms of different subscales of depression, anxiety as well as stress (Beaufort et al., 2017). The original version comprises three subscales of 14 items, whereas the DASS-21 is a simplified 21-item version, consisting basically of 7 items of each subscale and 3 dimensions with similar psychometric properties which help to rule out anxiety disorder and depression among workers with mood disturbance (Nieuwenhuijsen, De Boer, Verbeek, Blonk, & Van Dijk, 2003).

2.4 Job Satisfaction Evaluation

Holding skilled and adequate workers is essential for an organization to be well functioning and running in the long term. A happy worker is not just a retained worker but also an organization's representative. A satisfied employee will, therefore, go additional mile to achieve more goals and remain committed to the organization. Yet, Wahyudi et al. (2018) claimed that an increase in workloads could lead to fatigue, job

dissatisfaction, and human error. Job satisfaction can be measured using an established instrument such as Job Satisfaction Survey (JSS) questionnaire by Spector that covers nine aspects namely salary, promotion, operating methods, co-workers, work, communication, management, fringe benefit, and contingent rewards (Van Saane et al., 2003). Taskin et al., (2019) also addressed important factors that affect job satisfaction including pay, interpersonal relationships, acknowledgment, personal achievement opportunities and work challenges. Moreover, Shobe (2018) addressed Herberg 's theory on two important factors related to job satisfaction: accomplishment, ability to improve, appropriate work, acknowledgment, policy on interpersonal relationships, administration, and supervisory practices. With that said the basis for standards for job satisfaction is almost identical for all workers irrespective of whether they work in any field. For an employer, creating a positive work environment is very important in order to maintain high levels of job satisfaction. There is no one-size-fits-all model to build the best workplace. Therefore, regular job satisfaction assessment can be helpful for both employer and employee to continually enhance and sustain excellent work performance.

CHAPTER 3: METHODOLOGY

3.1 Study Population

This study was conducted at a selected electronic company in July 2020. The study population consists of workers from professional level working in office environment from various groups such as Human Resources, Supply Chain, Procurement, Logistic, and Engineering. The work location is in Subang Jaya, Selangor. The inclusion criterion is that workers must use a computer or a laptop for a minimum of 8 hours per day. The exclusion criteria are workers from technician level and below and with existing medical conditions, such as any illness or discomfort at any part of the body. The workers also have basic knowledge of ergonomics and the proper setup of the computer workstation. The study invitation was sent through an email to randomly selected workers and a total of 103 working men and women aged 30 to 56 years volunteered to participate in the study.

3.2 Study Instruments

For completion of this study, three instruments were used including a socio-demographic questionnaire, a mental load questionnaire (Carga Mental Questionnaire), Depression, Anxiety and Stress Scale (DASS-21) questionnaire, and a job satisfaction survey.

3.2.1 Socio-demographics Data

This questionnaire collected information on age, gender, the total length of service, and education qualifications of the professional workers.

3.2.2 Mental Workload

Carga Mental Questionnaire was used to identify perceived mental workload which includes cognitive, temporal, emotional/health, and performance demands (Rubio-Valdehita et al., 2017). CarMen-Q consists of 29 items with range for total score is

between 0 and 87. (Vallellano & Rubio-Valdehita, 2018). The format of items response uses Likert frequency scale of 4 points of 0 means never, 1 is rarely, 2 is often and 3 is always. Direct scores of every subscale were summed up for this study. The higher score indicates a higher mental load. From the results, the average score of mental workloads was measured for professional workers of males and females. Correlation between age and mental workload scores (CarMen-Q) and between the total length of service and mental workload scores (CarMen-Q) were analyzed using SPSS Software.

3.2.3 Depression, Anxiety and Stress Scales (DASS-21)

A self-report questionnaire containing 21 items or DASS-21 was used in this study. Symptoms of depression, anxiety, and stress were measured using the original scale by Lovibond and Lovibond. The questionnaire includes 7 items using a 4-point Likert scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). A structured interview was not included in this study to reduce administrative time. The workers took around 5 to 7 minutes to fill out DASS-21. The total score for DASS can range between 0 and 120 while for each subscale may range between 0 and 42. In this study, the average score of DASS-21 was measured for overall workers, male and female workers. Correlations between age and mental workload scores (DASS-21) and between the total length of service and mental workload scores (DASS-21) were analyzed using the statistical package for the social sciences (SPSS Statistics)

3.2.4 Job Satisfaction Survey (JSS)

This survey includes thirty-six items scored from one until six from original response choices in the English version. These items include nine facet subscales and scores for each subscale can range from four to twenty-four while for job satisfaction scores based on a total of thirty-six items, which can range from 36 to 216. Workers rated the questions on 6-point Likert-scale ranging from 1 *(Disagree very much)* to 6 *(Agree very much).*

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Results

Table 4.1: Descriptive analysis of socio-demographic data of the workers.

Socio-demographics	Frequency	Percentage (%)
Gender		
Male	54	52
Female	49	49
Total	103	100
Age		
30-40 years old	56	54
41-50- years old	35	34
50-56 years old	12	12
Total	103	100
Education Qualifications		
Certificate	2	2
Diploma	10	10
Degree	85	83
Master	6	6
Total length of service		
6 -10 years	20	20
11-15 years	26	26
16-20 years	36	36
More than 20 years	21	21
Total	103	100

In total, 103 professional workers participated in this study. Table 4.1 shows that 54 male and 49 female workers participated in the study. Workers whose age range falls between 30 and 40 years old are 56 which is the largest age group in this study, those that fall between 41 and 50 years old are 35 and the smallest age group is between 50 and 56 years old. In addition, Table 4.1 demonstrates that 85 workers hold a University degree, 10 possesses a Diploma; 6 possesses a Master's degree while only 2 had a Certificate level of education. Table 4.1 also shows that 20 workers have professional working experience between 6 and 10 years, 26 of them have spent between 11 and 15 years working as a professional, 36 workers have spent between 16 and 20 years while 21 workers have spent more than 20 years working as a professional.

Table 4.2: Descriptive analysis showing workers' mean and standard deviation scores on age, service length, and job satisfaction.

Variable	Mean	SD	Range
Age (years old)	40.40	6.30	3-56
Total length of service (years)	16.90	6.39	6-33
Job satisfaction	170.89	14.34	36-216

Table 4.2 indicates the Mean (M) and Standard Deviation (SD) value of the variable namely age with 40.4 (M) and 6.3 (SD); total length of service with 16.90 (M) and 6.39 (SD) and job satisfaction with 170.89 (M) and 14.34 (SD).

Table 4.3: Descriptive analysis showing workers' mean and standard deviation values for CarMen-Q

Variable	Total			Male			Female		
	Mean	SD	Percent	Mean	SD	Percent	Mean	SD	Percent
Performance Demands	13.2	2.1	88	13.4	2	89.6	12.9	2.1	86.1
Cognitive Demands	17.3	4	57.7	17.7	3.9	59	16.9	4	56.3
Emotional Demands	2.28	2.2	10.9	1.88	1.9	8.9	2.69	2.4	12.8
Temporal Demands	8.06	3	38.4	7.82	3.3	37.2	8.02	2.7	38.2

Table 4.3 indicates the Mean (M) and Standard Deviation (SD) value of the mental workload results from CarMen-Q for all workers which performance demands with 13.19 (M) and 2.07 (SD), cognitive demands with 17.30 (M) and 3.99 (SD), emotional demands with 2.28 (M) and 2.19 (SD) and temporal demands with 8.06 (M) and 3.02 (SD). For male workers, mean and standard deviation value for performance demands are 13.44 (M) and 2.01 (SD), for cognitive demands are 17.69 (M) and 3.94 (SD), for emotional demands are 1.88 (M) and 1.90 (SD) and for temporal demands are 7.82 (M) and 3.32

(SD). Moreover, for female workers, mean and standard deviation value for performance demands are 12.92 (M) and 2.13 (SD), for cognitive demands are 16.88 (M) and 4.04 (SD), for emotional demands are 2.69 (M) and 2.43 (SD) and for temporal demands are 8.02 (M) and 2.68 (SD). The highest demand is performance demands for both male and female workers while the lowest demand is emotional demands also for both male and female workers.

Table 4.4: Correlations of age and total length of service with mental workloads (CarMen-Q)

Variable		Age of workers	Total length of service (years)
Performance Demands	Pearson Correlation	0.210*	0.219*
	Sig. (2-tailed)	0.033	0.026
	N	103	103
Cognitive Demands	Pearson Correlation	0.205*	0.234*
	Sig. (2-tailed)	0.038	0.017
	N	103	103
Emotional Demands	Pearson Correlation	0.296**	0.289**
	Sig. (2-tailed)	0.002	0.003
	N	103	103
Temporal Demands	Pearson Correlation	0.154	0.157
	Sig. (2-tailed)	0.120	0.114
	N	103	103
Total Mental Workloads	Pearson Correlation	0.278**	0.293**
	Sig. (2-tailed)	0.004	0.003
	N	103	103
**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).			

Table 4.4 shows positive correlations between ages of workers with three mental workloads subscales of CarMen-Q, which was statistically significant. For relationship between the age and performance demands, Pearson correlation coefficient, r is 0.210 with $p < 0.05$; relationship between age and cognitive demands, r is 0.205 with $p < 0.05$ while the relationship between age and emotional demands, r is 0.296 with $p < 0.01$. In

addition, for the relationship between length of service and performance demands, r is 0.219 with $p < 0.05$, the relationship between lengths of service with cognitive demands, r is 0.205 with $p < 0.05$, and the relationship between the lengths of service with emotional demands, r is 0.289 with $p < 0.01$. Both age and length of service are positively correlated with three CarMen-Q subscales of performance demands, cognitive demands, and emotional demands.

Table 4.5: Descriptive analysis showing workers' mean and standard deviation values for mental workloads, DASS-21

Variable	Total			Male			Female		
	Mean	SD	Result	Mean	SD	Result	Mean	SD	Result
DASS-Depression	0.45	1.3	Normal	0.52	1.4	Normal	0.37	1.1	Normal
DASS-Anxiety	1.3	1.6	Normal	0.93	1.4	Normal	1.71	1.6	Normal
DASS-Stress	6.23	3.7	Mild	4.63	3.6	Normal	8	2.9	Mild
DASS-Total	7.98	4.8	-	6.07	4.7	-	10	3.9	-

Table 4.5 shows the mean (M) and standard deviation (SD) value of the workers for DASS-21 namely depression with 0.45 (M) and 1.25 (SD), anxiety with 1.30 (M) and 1.55 (SD), stress with 6.23 (M) and 3.72 (SD) and total score with 7.98 (M) and 4.79 (SD). For male workers, the mean and standard deviation value are 0.52 (M) and 1.41 (SD) for depression, 0.93 (M) and 1.39 (SD) for anxiety, 4.63 (M) and 3.64 (SD) for stress and 6.07 (M) and 4.73 (SD) for the total score while for female workers, 0.37 (M) and 1.05 (SD) for depression, 1.71 (M) and 1.63 (SD) for anxiety, 8.0 (M) and 2.94 (SD) for stress and 10.03 (M) and 3.94 (SD) for the total score. The level of depression and anxiety are normal for both male and female workers while the stress level is mild for female workers and normal for male workers respectively.

Table 4.6: Correlations of age and total length of service with mental workload scores (DASS-21)

Variable		Age of workers	Total length of service (years)
DASS – Depression	Pearson Correlation	0.032	0.037
	Sig. (2-tailed)	0.748	0.708
	N	103	103
DASS-Anxiety	Pearson Correlation	0.029	0.013
	Sig. (2-tailed)	0.773	0.897
	N	103	103
DASS-Stress	Pearson Correlation	0.076	0.059
	Sig. (2-tailed)	0.448	0.556
	N	103	103
DASS-Total	Pearson Correlation	0.076	0.060
	Sig. (2-tailed)	0.444	0.550
	N	103	103

Table 4.6 shows that age and total length of service have no significant relationship with mental workload (DASS-21). For correlations between the age of workers and DASS-Total score, Pearson correlation coefficient, r is 0.076 with $p > 0.05$ while for the relationship between the total length of service and DASS-Total score, Pearson correlation coefficient, r is 0.06 with $p > 0.005$.

Table 4.7: Descriptive analysis showing workers' mean and standard deviation values for job satisfaction

Variable	Total		Male		Female	
	Mean	SD	Mean	SD	Mean	SD
Pay	19.3	2.83	19.6	2.76	19.0	2.91
Promotion	17.9	2.88	18.0	3.03	17.8	2.73
Supervision	19.5	2.86	19.6	2.59	19.5	3.15
Fringe Benefits	18.4	2.47	18.5	2.46	18.4	2.51
Contingent rewards	18.3	2.59	18.5	2.72	18.0	2.45

Table 4.7 continued

Operating conditions	14.5	1.94	14.5	1.88	14.6	2.02
Co-workers	20.6	2.02	20.9	1.79	20.3	2.22
Nature of work	20.7	1.98	20.7	2.07	20.7	1.89
Communication	21.6	1.80	21.8	1.72	21.5	1.89
Job satisfaction	170.89	14.34	172	15	169.8	13.8

Table 4.7 shows the mean (M) and standard deviation (SD) value for job satisfaction for male, female and overall workers. Job satisfaction score for male workers (M=172) is slightly higher than female workers (M=169.8). Communication (M=21.6), nature of work (M=20.7), coworkers (M=20.6), pay (M=19.3), and supervision (M=19.5) are among the top five scores for job satisfaction investigation.

Table 4.8: Correlation of age and total length of service with total job satisfaction

Variable		Age	Total length of service (years)
Job satisfaction	Pearson Correlation	0.175	0.170
	Sig. (2-tailed)	0.077	0.086
	N	103	103

Table 4.8 shows that the correlations of age and total length of service with total job satisfaction are about the same with the Pearson correlation coefficient, *r* is 0.0175 and 0.170 respectively and significance level, $p > 0.05$.

Table 4.9: Correlation table showing the relationship between job satisfaction and mental workloads.

Variable		Job satisfaction
Mental workloads (DASS-21)	Pearson Correlation	-0.025
	Sig. (2-tailed)	0.801
	N	103
Mental workloads (CarMen-Q)	Pearson Correlation	0.141
	Sig. (2-tailed)	0.154
	N	103

Table 4.9 above shows that there is no significant relationship between job satisfaction and mental workloads. The Pearson correlation coefficient value, *r* is -0.025 for DASS-21 and positive correlation for CarMen-Q where *r* is 0.141 while both significance level, $p > 0.05$.

4.2 Discussions

Findings from this study revealed that performance demands is the highest demand (more than 80%) required in this organization. Every task designed for the worker requires a high level of job responsibility and performance requirements. The second highest demand revealed from the study is cognitive demands, which recorded at 57.7%, indicates the process of complicated information, a job that required decision to be made, and capacity in choosing to pay attention or to ignore. Apart from that, temporal demands scored 38.4%. It signified that the work's structure in the organization does not required a high pace for work completion. Emotional demands is the lowest demand required, which means the work assigned does not cause workers to worry, stress, or panic (Rubio-Valdehita et al., 2017). Additionally, there is significant correlations between age of workers and mental workloads (CarMen-Q) based on statistical analysis. The age of workers relatively correlates with performance demands, cognitive demands, and emotional demands in this organization except for temporal demands.

The analysis of DASS-Stress indicates that female workers have mild stress (M=8.0) compared to male workers (M=4.63). Variety of factors that caused stress among working women, such as attitude towards life, critical skills, support system, and personality type (Qureshi, 2017). Proper intervention in stress management is important for better wellbeing of workers. Mental health campaigns and awareness program should be conducted at the workplace on a regular basis. Furthermore, free mental health assessment and counselling session should be provided to all workers. The mental workload level for female workers (M=10) is higher than male (M=6.07) and there was no worker with depression issues or mood disturbance based on overall DASS results. It is one of the important indicators for top management to gauge the results of investment on ergonomically friendly workstations for all the workers. Bemer (1982) also addressed that the application of ergonomics for computer workstation creates positive effects of mental health among the workers (Mustafa, Kamaruddin, Othman, & Mokhtar, 2009). Additionally, setting up a chill out area and a reading corner would help to decrease stress level among the workers. Last but not least, continuous evaluation of mental workloads level is equally important as offering robust rewards for the workers (Omolayo, 2015). Mental workload evaluation should be repeated after implementation of proposed measures.

Findings from job satisfaction evaluation suggests that there is room for improvement with respect to operating conditions (M=14.5). Among the four items under this subscale, item no. 24. *I have too much to do at work* achieved the highest score and followed by item no. *31.I have too much paperwork.* Examples of workplace improvements have been started including the development of internal work applications such as corrective action report application, visitor management application, daily downtime application, failure analysis tracking application, learning management system, and real-time monitoring for utility plant. These initiatives help to reduce administrative work for the workers.

Additionally, the management team should review the current package of benefits and compensation to improve workers' satisfaction related to fringe benefits (M=18.4) and contingent rewards (M=18.3). Other recommendations would be to recontinue safety good catches reward and High-5 recognition programs. Apart from that, review on current job grade and level will improve satisfaction level related to promotion area. There are several ergonomics factors that contribute towards better job satisfaction such as cognitive factors, physical improvement, and organizational factors. In addition, environmental factors such as average temperature, lighting, and humidity at the workplace also give a substantial effect on job satisfaction (Dawal & Taha, 2006).

In general, job satisfaction positively correlates with mental workloads (CarMen-Q) based on statistical analysis. Job satisfaction level for male workers is slightly higher compared to female workers. The communication element scored the highest points (M=21.6) on job satisfaction evaluation. Frequent review sessions such as KPI quarterly review meetings and townhall meetings help to prevent communication breakdown between management and workers. Additionally, various communication channels for workers to provide feedback and non-retaliation policies in the organization create a safe and conducive working environment. Workers are generally satisfied with the nature of work (M=20.7) and based on socio-demographic data, about 80% of workers have been working in this organization for more than 10 years and they also enjoy working with their co-workers (M=20.6).

CHAPTER 5: CONCLUSION

Based on the findings of this study, the level of mental workload and stress among professional workers working in an office environment is low from the results of DASS-21 and CarMen-Q. The stress level of female workers is mild, which slightly high compared to male workers. There are significant correlations between age of workers and mental workloads (CarMen-Q) based on statistical analysis. The age of workers relatively correlates with performance demands, cognitive demands, and emotional demands in this organization except for temporal demands. The level of job satisfaction among professional workers is about 80%. There are opportunities for improvement by top management to conduct campaigns and programs to increase awareness on mental health and to review current job grade, compensation and benefits packages for improvement of job satisfaction (related to promotion, operating conditions, contingent rewards, and fringe benefits).

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