MENTAL WORKLOAD ASSESSMENT AMONG HEALTHCARE WORKERS DURING PANDEMIC COVID-19 AT HOSPITAL TUNKU AZIZAH

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FACULTY OF ENGINEERING
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ABSTRACT

Workload is the amount of work an individual has to do. There is a distinction between the actual amount of work and the individual's perception of the workload. In addition, with current pandemic situation, definitely causes an increased workload among healthcare workers. Somehow, front-liners are doing their best in battling COVID-19 to protect publics from any adverse effects by this aggressive identified Coronavirus. The purpose of this study is to determine level of mental workload and its relationship on mental health status and job satisfaction among healthcare workers. Scope of this study involving medical laboratory workers in Pathology Department Hospital Tunku Azizah. Here, 85 workers from this department has been recruited as study subjects. This is a cross-sectional quantitative descriptive study using questionnaire. Research tools used for this questionnaire are CarMen-Q, DASS-21 and Job Satisfaction Survey (JSS). Questionnaire conducted via Google Form an analysed by SPSS-21 software. Mental workload are the independent variable of this study while the dependent variables are mental health status (*depression, anxiety and stress*) and job satisfaction. Data were analyses using descriptive statistics (percent, mean and standard deviation) and inference statistics (correlation). The findings of this study show Pathology Department workers are burdened with high mental workload with at least M=54.23, SD= 12.193. In this context, mental workload dimensional was found to have a significant correlation on mental health status and job satisfaction level among health workers. To conclude, this study has proven that healthcare workers are experiencing high mental working and have significant effects on their mental health status and their job satisfaction. Sets of strategies managing high level mental workload in Pathology Department need to be implemented

Keywords: COVID-19, pandemic, pathology department, laboratory, medical laboratory, mental workload, depression, anxiety, stress, work environment and job satisfaction.

ABSTRAK

Beban kerja adalah jumlah kerja yang harus dilakukan oleh seseorang individu. Terdapat perbezaan antara jumlah kerja sebenar dan persepsi individu terhadap beban kerja. Di samping itu, dalam keadaan pandemik, pastinya memberi kesan peningkatan beban kerja di kalangan pekerja kesihatan. Walaubagaimanapun, barisan depan tetap menjalankan tugas dengan baik dalam memerangi wabak COVID-19 dan melindungi masyarakat daripada sebarang kesan buruk dari wabak Coronavirus ini. Oleh yang demikian, kajian ini adalah untuk mengkaji tahap beban kerja mental dan hubungan dengan tahap kesihatan mental dan kepuasan kerja di kalangan pekerja kesihatan. Skop kajian ini adalah melibatkan pekerja makmal perubatan di Jabatan Patologi Hospital Tunku Azizah. Seramai 85 pekerja dari jabatan ini telah dipilih sebagai subjek kajian. kajian rentas kuantitatif ini menggunakan kaedah soal selidik. Alat kajian yang digunakan untuk soal selidik ini adalah CarMen-Q, DASS-21 dan Kajian Kepuasan Kerja (JSS). Borang kaji selidik mengunakan medium *Google Form* dan dianalisa oleh perisian SPSS-21. Beban kerja mental adalah pemboleh ubah tidak bersandar manakala pemboleh ubah bersandar bagi kajian ini adalah status kesihatan mental (kemurungan, kegelisahan dan tekanan) dan tahap kepuasan kerja. Data dianalisis menggunakan statistik deskriptif (peratus, min dan sisihan piawai) dan statistik inferensi (korelasi). Hasil kajian menunjukkan bahawa pekerja Jabatan Patologi dibebani dengan beban kerja mental yang tinggi dengan sekurang-kurangnya M = 54.23, SD = 12.193. Dalam konteks ini, dimensi beban kerja mental didapati mempunyai hubungan yang signifikan terhadap status kesihatan mental dan tahap kepuasan kerja di kalangan pekerja kesihatan. Kesimpulannya, kajian ini telah membuktikan bahawa pekerja kesihatan mengalami pekerjaan mental yang tinggi dan mempunyai kesan yang signifikan terhadap status kesihatan mental dan kepuasan kerja mereka. Oleh yang demikian strategi menguruskan beban kerja mental tahap tinggi di Jabatan Patologi perlu dilaksanakan.

Kata kunci: COVID-19, pandemik, jabatan patologi, makmal, makmal perubatan, beban kerja mental, depresi, kegelisahan, stress, persekitaran kerja dan kepuasan kerja, tekanan kerja.

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COVID-19	:	Coronavirus disease 2019
OSH	:	Occupational Safety and Health
MOH	:	Ministry of Health
PUI	:	Person Under Investigation
PUS	:	Person Under Surveillance
PL	:	Pathology Laboratory
GL	:	Genetic Laboratory
WHO	:	World Health Organisation
DOSH	:	Department of Safety and Health
FMA	:	Factory and Machine Act
OSHA	:	Occupational Safety and Health Act
NIOSH	:	National Institute of Occupational Safety and Health
NASA-TLX	:	The National Aeronautics and Space Administration - Task Load Index
MWL	:	Mental Workload
CarMen-Q	:	Carga- Mental Questionnaire
DASS-21	:	Depression, Anxiety and Stress Scores of 21 Questions
JSS	:	Job Satisfaction Survey
MLT	:	Medical Laboratory Technologist
SO	:	Science Officer
HTA	:	Hospital Tunku Azizah
HKL	:	Hospital Kuala Lumpur
KOSPEN-PLUS	:	Program Komuniti Sihat Pembina Negara Plus
ABM	:	Anggaran Belanjawan Mengurus

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter explains the content of the research, problem statement, questions, and aim of the study, scope, and importance of the task, and the definition of the main terms of the study aspects.

1.2 Background of The Study

As people aware, Coronavirus disease 2019 (COVID-19) is an infectious disease that has spread globally due to Severe Acute Respiratory Syndrome Coronavirus (SARS-Cov-2) since December 2019 and first infected people in Wuhan, China, contributing to the current pandemic (CDC 2020). The 2019-2020 Coronavirus pandemic was early detected in Malaysia on 25th January 2020 (MOH 2020). Within a few weeks and months, Malaysia has the most enormous total number of confirmed COVID -19 infections in South East Asia. For example, on 4th April 2020, there were more than 3,483 confirmed cases in the country, with 57 recorded deaths. As of 31st December 2020, 2,525 new cases have been reported, with a cumulative of 113,010 positive diagnosed cases with 471 (0.4%) deaths reported in Malaysia. Since February 2020, Hospital Kuala Lumpur has been designated as one of the COVID-19 screening and treatment centers. Based on this scope, the majority of Hospital Kuala Lumpur health services are affected by this pandemic crisis, such as the increased amount of workload, experience longer working hours, shortage resources and labour, higher turnover shift, increased number of screening and care admissions, extensive Standard Operating Procedures, limited facilities, logistic, technology, expertise, and skills. Thus, this has profoundly impacted healthcare personnel either physically, mentally, or emotionally.

The pandemic condition is getting worse in the third quarter of the year 2020 as the case rises sharply into four digits' trends and numbers of patients in most government hospitals. In any emerging infectious and developing illness, most healthcare workers are unfortunately at-risk due to direct involvement with patients and samples. In the current situation, factor such as rising number of patients, longer working hours, mental and physical exhaustion, experience sense of danger and uncertainty, as well as lack of knowledge and awareness about the progress either management of COVID-19 have raised the workload among healthcare staffs (Zhu, Z., et al 2020). As a sub-hospital under Hospital Kuala Lumpur, Hospital Tunku Azizah (HTA) had a similar effect. As mentioned above, they face erratic work schedule norms and have massive workloads, cases, and work in an inadequate or inappropriate environment. Generally speaking, in this case, most of the healthcare are overwhelmed and feeling exhausted. In a demanding climate, doctors, nurses, paramedics, scientists, and allied-health professionals work with higher expectations than their regular duties and skills. For an instant, nurses in critical care areas have vast duties and minimal latitude, leading them to an exceedingly higher workload, both physically and mentally. In addition, nurses are engaged in multiple decision-making in urgent circumstances that are important to patient lives. Based on Abbey et.al. reported almost 3081 events conducted by ICU nurses during the day shift were registered, of which 43 percent were conducted simultaneously. This effect means an increased risk of medical errors and the possibility of reducing the welfare of patients or even the safety of personnel. This current situation impacted the medical and surgical division and greatly affected the clinical diagnostic discipline as such; radiology and diagnostic, pathology and genetic laboratories and pharmacies division. Here, in this study, researchers concentrate on the pandemic situation on Pathology Department Staff at Hospital Tuanku Azizah.

Since 11th February 2019, the Department of Pathology has been functioning and

currently has 95 laboratory personnel in various professions and divisions. HTA is a tertiary center and one of the main national referral hospitals. Department of Pathology HTA is a referral diagnostic laboratory for the Ministry of Health and other government agencies. Testing to screen, diagnose, risk stratify, prognosticate, and monitor disease progression towards excellent patient care and management is included in the services offered here. The department also engages in-hospital programs, provides training, and conducts pathology-related studies, diagnostic genetics, and other scientific areas. Since HTA uses the Hospital Information System (HIS), the Pathology Department uses the Laboratory Information System (LIS) to ensure that clients are presented with quick and reliable results. The core discipline under Pathology Department is Hematology, Medical Microbiology, Chemical Pathology, and Genetic services such as Cytogenetic, Molecular Genetics, and Inborn Errors of Metabolism. These procedures are typically designed as elective, routine, or urgent samples that require higher concentration and greater productivity from the pathology laboratory, referring to the volume of samples and workloads for the year 2019 in the Pathology Department (referring to Table:1.1 below).

Moreover, other medical and surgical disciplines are depending on their finding for further clinical management. Currently, most inpatients scheduled electively or emergency for surgical and invasive procedures must conduct Severe Acute Respiratory Illness (SARI) and Influenza likely illness (ILI) and COVID-19 screening prior to any scheduled in-house procedure. As a result, the workload and work demand among employees of the Pathology Department has increased. Thus, this anticipation will also impact the workers' psychology and mental health state or even occupational satisfaction with their current job. Table 1.1 below shows the workloads (volume of test) conducted by Pathology Department for the year 2019.

Table 1.1: Summary of workloads level (Test) of Pathology Department Hospital Tunku Azizah for the year 2019.

MONTH	VOLUME OF SAMPLE	Days in month	Average monthly samples
Jan-19	78,985	31	2,548
Feb-19	42,518	29	1,466
Mar-19	86,028	31	2,775
Apr-19	82,003	30	2,733
May-19	84,849	31	2,737
Jun-19	75,079	30	2,503
Jul-10	90,217	31	2,910
Aug-19	82,720	31	2,668
Sep-19	72,936	30	2,431
Oct-19	89,517	31	2,888
Nov-19	100,481	30	3,349
Dec-19	94,142	31	3,037
Overall total	**979,475**	**366**	**2,676**
SD (average monthly samples)			**454**
SD (volume of samples)	**14,567**		

Sources: Pathology Department of Hospital Tunku Azizah 2019 Annual Report.

1.3 Problem Statement

Focused on the context above, Hospital Tunku Azizah had experienced a significant impression towards this pandemic COVID-19 as Hospital Kuala Lumpur sub-hospital and operated as one of the primary referral centers in Malaysia. Here, as Malaysian's main national referral hospital with a capacity of 600 bedded, HTA certainly had a tremendous number of patients either new cases referral, follow-up, and inpatient cases. Therefore, as one of the leading medical facilities, Pathology Department had also obtained a

significant volume of specimens and samples for screening, diagnosis, and laboratory investigation. In accordance with this pandemic, HTA Pathology Department also experienced such a traumatic and stressful experienced when three (3) of their employees were diagnosed with positive COVID-19 between April and May 2020. This has triggered their concern and sense of danger when performing laboratory work. Hence, they have no choice but to continue to operate with robust Personal Protective Equipment's (PPEs) and comprehensive Standard Operating Procedures (SOPs) to ensure maximum efficiency while guaranteeing their safety. In line with this, the researcher expected that the emotional and physical workload would be raised while maintaining promises outcome attributable to other clinical demands. Thus, the staff must work extra carefully with extensive PPE's requirement to ensure they are safe and protected from COVID-19 or other infectious contaminations. Plus, measuring mental workload among the pathology department employees would have a beneficial outcome in managing occupational issues among employees of this department. For all laboratory fields, but especially in the disciplines of general laboratory clinical pathology, clinical biochemistry, hematology and transfusion medicine, and microbiology and genetics, this approach offers valuable insights into burdens and obligations that cannot be extrapolated from other indicators.

Furthermore, it will help to evaluate the relationship between excessive mental workload on mental health status and job satisfaction among workers during this pandemic. Besides, it also serves as a mechanism to ensure healthier organization and exercise suitable control measures in managing workload issues, mental health, and job satisfaction among employees during this pandemic or even in regular seasons. Herzberg et al, (1959), in their theory, has claimed that the job satisfaction is a positive perspective and feeling about their jobs that workers have. This job satisfaction relies on multiple variables and differs significantly between one employee and another. The selection of

Healthcare roles in this study is based on the group among the frontline staffs at hospital and health facilities that provides direct services to patients. Because of the current nature, a concern arises as to whether healthcare employees have an acceptable workload level and whether it impacts their mental health status or occupational satisfaction. In work done, job satisfaction may relate to workload, work stress, and the working environment. Therefore, the study will be conducted to obtain a full picture and information on the level of mental workload demand and its relationship with mental health status and job satisfaction among Pathology Department staff at Hospital Tunku Azizah.

1.4 Research Questions

This thesis attempts to discover the solution to the questions as follows, based on the problem statements mentioned above:

1. What is the level of Mental Workload among healthcare workers (Pathology Department staffs) during pandemic COVID-19?
2. Is there are differences in mental workload levels between Pathology Laboratory Division and Genetic Laboratory Division?
3. What is the mental workload level based on occupation designation and working experiences?
4. How is the mental health status (depression, anxiety, and stress scales) among healthcare workers in Pathology Department Hospital Tunku Azizah?
5. Is there a relationship between mental workload on mental health status and job satisfaction among healthcare workers in Pathology Department Hospital Tunku Azizah during pandemic COVID-19?
6. What is the relationship between work environment towards employee job satisfaction among Pathology Department staff?

1.5 Research Objective

Referring to the above research questions, this study intends to fulfil the specific research objectives:

1. To determine the level of mental workload among healthcare workers during pandemic COVID-19 in Pathology Department HTA.
2. To determine the mental health status among healthcare workers during pandemic COVID-19 in Pathology Department HTA.
3. To identify the relationship between mental workload on mental health status and overall job satisfaction among Pathology Department workers.
4. To propose a significant recommendation in managing workload issues, mental health status, and job satisfaction among Pathology Department workers in HTA.

1.6 Scope of The Study

Hospital Tunku Azizah was chosen due to its over 2080 employees' workforce and as the leading tertiary referral center for women and children's health facilities in Malaysia. Narrowing to the scope sampling, the researcher has selected Pathology Department HTA as the primary sampling point. This department consists of 95 healthcare resources from various work designations such as Pathology Specialist, Genetics Specialist, Doctors, Science Officers, Medical Laboratory Technologist, and Hospital Attendant. Here, limited research was conducted to assess the workload among Pathology Department staff. Indeed, their services are crucial and essential in ensuring comprehensive management to support all the diagnoses and nursing care. Therefore, this study emphasizes the mental health risk factors of these employees to determine their mental workload from a subjective perspective using mental health risk assessment tools and evaluate their satisfaction with current jobs.

1.7 Limitation

The boundary of this study limits to a selected department involved with this study. By more than forty (40) Departments and Units available in Hospital Tunku Azizah, the researcher can only apply the Pathology Department as the study's key scope. At earlier stages, the researcher is expected to receive ethics clearance from the Clinical Research Centre, the National Medical Research and Ethics Committee (NMREC) of the Ministry of Health Malaysia, the Director of Hospital Tunku Azizah, the Head of Pathology Department before performing this research. This process took about six (6) to eight (8) weeks to approved this procedure for all applications documentation submitted for review and acceptance by the committee. In addition, this study involved two (2) co-investigators at the level of the Pathology Department and one (1) representative of the Psychiatric and Mental Health Department due to ethical requirements. Furthermore, it is a very tough period for a researcher to conduct the study as the researcher require to serve and lead the Occupational Health and Safety Team (OSH) at Hospital Tunku Azizah in managing all the COVID-19 cases, Person Under Investigation (PUI) and Person Under Suspected (PUS) cases involving employees and the stakeholders in this hospital. Served as front-liners during this period makes this research more challenging as researchers require to separate the commitment towards research study and staff safety to ensure the continuity of hospital operations.

According to the timeline provided by the Faculty of Engineering, University of Malaya, this study was carried out within nine (9) months. The entire study process was accomplished by following the precautionary measures to be taken during the COVID-19 pandemic. Hence, discussions, surveys, and interviews were performed online to limit face-to-face conversation.

1.8 Significant of Study

Mental workload and work-related may influence mental health and psychology status also towards job satisfaction among healthcare workers. There is less study conducted in Malaysia to measure any significant impact on this group of healthcare workers. Therefore, this study will help determine whether the level of mental workload has any significant effect on mental health status and job satisfaction among workers. In addition, does the workload, work stress, and working environment contribute to job satisfaction among laboratory workers in the department.

This study will provide future scholars with data and knowledge on mental workload related factors that contribute to the mental health status and job satisfaction among Pathology Laboratory workers. This study may benefit the Hospital Management, Ministry of Health Malaysia Administrator, even the Hospital Director, and middle-level managers/supervisors because of this knowledge. On the other hand, top managers can better manage occupational mental workload demand, mental health status, and an improved level of job satisfaction among workers. In a nutshell, this study's findings are important as a guide to management and supervisors in their respective departments to understand and identify those factors as contributors to those issues mentioned above. At the same time, it can work as a scale to this matter and improve the efficiency of premier service culture, patient safety, and occupational health among workers.

1.9 Definition of the Key Term

i. **Pathology Specialist.** The physician who studies body fluids and tissues helps primary care doctors diagnose patient health or any medical problems and uses laboratory tests to monitor the health of patients with chronic conditions.

ii. **Science officer.** The scientist who perform complex tests and procedures that help other healthcare professionals, such as physicians, detect, diagnose, and treat diseases from laboratory diagnostic testing in the hospital.

iii. **Medical Laboratory Technologist.** MLT performs complex tests and procedures that help other healthcare professionals, such as physicians, detect, diagnose, and treat diseases from laboratory diagnostic testing in the hospital.

iv. **Hospital Attendant.** Medical staffs working at a hospital and caring for patients.

v. **Mental workload.** Mental workload is viewed as the difference between the capacities of the information processing system required for task performance to satisfy performance expectations and the capacity available at any given time.

vi. **Workload.** The burden of work or duty required by the Healthcare workers.

vii. **Psychological**. Psychology states of healthcare workers during the pandemic season.

viii. **Mental Health Screening**: Screening consist of three variables such; Depression, Anxiety, and Stress

ix. **Job Satisfaction.** The negative degree to which individuals feel positive or negative about their job.

x. **Occupational stress**. It also arises from unforeseen obligations and stresses that do not fit with the experience, capacities, or desires of an individual, inhibiting one's capacity to cope. When employees do not feel encouraged by managers or superiors or feel less control over job processes, workplace stress may increase.

xi. **Working Environment**. The work environment includes supervisor roles, peer influence, communication, promotion, rewards, and recognition.

1.10 Chapters Summary

The literature on the context of the analysis, the problem statement, the problems and goals of the study, the nature and significance of the study, and the description of the key words of the study were examined in this chapter. The workload, mental workload, depression, anxiety, stress, work stress, working environment, and job satisfaction literature related to the research will be addressed in depth in the next chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter describes the literature review on the workload, mental workload, mental health status and screening, work stress, working environment, job satisfaction, Maslow theory, previous research finding, etc. It also will discuss the research framework and hypothesis development for this study.

2.2 Medical Pathology Laboratory Services

An integral aspect of staff preparation and workload allocation is understanding the workload and individual roles and duties of laboratory physicians. This is a laboratory to facilitate the health care offered at the hospital in almost every hospital. Both anatomical (surgical pathology, cytopathology, autopsy) and clinical (laboratory medicine) pathology in most hospitals will be used in specialised pathology facilities. The majority of patients admitted and many outpatients treated by hospital-affiliated doctors need examinations administered by hospital laboratories. Based on Dr. Ananya Mandal (2019), the word 'pathology' means studying disease processes. Pathology includes studying the cause, how it progresses, the impact of pathogens on cells, and the result of the disease. Cellular pathology, cell necrosis or cell death, wound healing, cancer growth, and inflammation are among the facets of the disorder that can be researched. General anatomy is called a mixture of both anatomical pathology and clinical pathology. In addition, the areas of pathology require the study of body-extracted surgical specimens or even the examination of the entire body (autopsy) for the

investigation and diagnosis of the illness. The following considerations are taken into account when analyzing a biopsy; Sample gross anatomical structure, cell microscopic presence, chemical signatures in the sample, cell immunological markers, cell molecular biology, muscles, tissues, and even the whole body. Thus, Anatomical pathology is further classified into subspecialties, examples of which include; Surgical pathology, which involves the examination of specimens obtained during surgery such as a breast lump biopsy obtained during mastectomy, Histopathology which refers to the examination of cells under a microscope after they have been stained with appropriate dyes, Cytopathology that shed into bodily fluids or has been obtained by scraping or aspirating tissue are examined, Forensic pathology involves the post mortem examination of a corpse for the cause of death using a process called an autopsy. Dermato-pathology concerns the study of skin diseases. Based on Oxford (2019), the modern practice of pathology is split into various sub-disciplines within the discrete but deeply interconnected aims of biological research and medical practice.

On the other hand, due to the breakthrough in genome and exome sequencing technology, molecular genetic diagnosis research has become highly advanced in recent years. In highly penetrating diseases and cancer, these play an increasingly important role, allowing faster and more reliable diagnosis, carrier testing of hereditary illnesses, family planning, and customised therapy collection and monitoring. Therefore, one of the most important tools in the precision medicine era is molecular genetic testing and clinical genomics. At the same time, molecular genetic laboratories must ensure high-quality efficiency, taking into account the criteria of healthcare providers and patient management, biological sample

numbers and forms, primary difficulties for each genetic/genomic technology, reporting processing times, optimization of laboratory operating environments, and post-testing medical teams for patient treatment, Sentft D et al. (2017). In addition, Molecular Genetic Pathology (MGP) is the sub-specialty of Pathology and Medical Genetics in which molecular biology and molecular genetics concepts, hypotheses, and technology are used to help make clinical diagnoses, evaluate disease prognosis, monitor diseases and treatments, and provide risk assessments for genetic disorders. Plus, molecular pathology is fast becoming an essential diagnostic and prognostic instrument in the routine practice of medicine, the subspecialty, Rubbin (2019). Based on Enrico (2018), the MC example research used in required processes (i.e. extraction of nucleic acid and quality management along with approval and codification of samples) indicates that their centralization, along with automation in joint work units, may help to implement reliability and minimise staff costs for these processes.

Moreover, these could be shared between laboratories working on nucleic acids, including microbiology/virology and pathology labs. Laboratory automation is also relevant for its impact on the global quality of results, as it drastically reduces errors. The research explored the use of automated processes for both traditional molecular biology methods and examination of specimens and concluded that 69% of the laboratories used automatic DNA extraction.

2.3 Mental Workload

According to Stanton & Young (2005), mental workload means "the level of attentional resources required to meet both objective and subjective performance criteria, which may be mediated by task demands, external support, and experience" or, in basic terms, when there is a discrepancy between requirements and competencies (Young et al., 2015). Three associated components of mental workload are input loads, such as length and job load, worker commitment (as inputs), and work efficiency (as output) (Fan & Smith, 2017).

Mental workload is classified as the brain's capacity for data processing to execute a task. It comprises multiple mechanisms such as cognitive, perceptual, and neurophysiological. It is determined by an individual's skill and attributes, motivation to accomplish a task, task fulfillment methods, and the physical and emotional state of being (Alfonso Brazález, et al., 2018). Task demands, performance, and human capacity have been addressed since more than thirty (30) years ago. Still, the attention was mainly on the aviation sector as there is a requirement to track pilots' performance and air traffic control.

As the need for workload has been gradually shown to impact professional drivers' psychological aspect, many analytical studies have arisen that narrow down into assessment of mental workload in the organizational context (Silva, 2014). Past findings have also demonstrated that human performance can be influenced by their emotional performance in carrying out a task (Waffectescu et al., 2016). It is not just the overload conditions that restrict the mental workload. Brookhuis & de Waard (2010) considered that the sub-optimum workload can be either overloaded or under loaded. Wilson and Rajan (1995) reviewed that, just like overloaded conditions, under loaded conditions can effect to workers' performance (p. 208 as quoted in Salmon, Stanton, Gibbon, Jenkins, & Walker, 2009). Therefore, it would not help to maximise job productivity as the mental burden is minimised, although the reverse might be true (Young et al., 2015).

Furthermore, Brookhuis & de Waard (2010) say that overloaded and loaded environments will lead to problems with error, decreased focus, warnings, interruption, averting attention, and processing of information.

The workload is the characteristics of a job that influence the ability of humans to conduct work according to the mechanism used by a person executing the task (Megan, 2005). Meanwhile, work demand is the combination of the time expected to execute the task to the time available to perform the task (Wickens, 2008). Wickens has stated that the composition of the workload is the availability of operating system tools, job demand, and the capability of an individual. The study paper indicated that workload would alter and decrease the capability of a person. The intensification and growth in job demand lead to quick mistakes and increased errors depending on rate of reaction (Cox-Fuenzalida, 2007). Arise in the demand for tasks results in an unsustainable mental workload that addresses mental health issues such as fear, anxiety, shame, frustration, depression, desperation, and boredom (Fraser, 1992). Headache, abdominal pain, forgetfulness, absent-minded, anxiety, irritability, and hopelessness are perceived signs that may be observed (Hancock & Meshkati, 1988). Therefore, an appropriate workload range should be considered by the employer for a position or task. Workers may not realize their conditions until the circumstances of underload or overload impair them. For 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.

There are also improvements in existing habits, such as smoking, alcohol use, and isolation from other persons (Prabaswari et al., 2020). A company struggles with the complexities of the workload of workers and activities that vary within the same organisational level. Such workload distribution differences among employees of the same level can be defined primarily by the organization's educational history, experience,

and classification of the employees. A person experiences unfair treatment on the basis of equity theory as he observes that his competitors earn more than him, while all have made the same effort at work (Inegbedion et al., 2020). This, as a result, induces disaffection within the company's workers. With the unequal position of work spread among workers, this affects the level of stress of employees, including the discernment between them of fair workload balance. In this situation, these lead to insinuation of the work stress strain, job satisfaction and efficiency of workers, whether the workload is added or decreased (Ali & Farooqi, 2014).

2.3.1 Workload

Spector (1997) says the workload can be defined as the type of job workers needs to perform, including job duties, job responsibilities, and work scope. Typically, each employee has the job responsibilities that they need to perform. The workload specified by Jex (1998) is the amount of work a person has to do. A difference occurs between the real amount of work and the interpretation of the workload by the individual. It is also possible to define the workload as quantitative (the sum of work to be done) or qualitative (the complexity of the work). Workloads can be separated into at least three workload categories, such as workloads at the job level, workloads at the unit level, and workloads at the work level (BMJ Quality and Safety).

Latip et al. (2018) found that workloads occur when workers are given workloads beyond their capacity due to increased productivity and performance demands. Workload most commonly identified stressors (Li & Lambert, 2008). Li et al. (2012) that heavy workload was also included in hospital-based Brazilian nurses as a major contributor to stress. Analysis by Nieuwenhuijsen, Bruinvels, and Frings-Dresen (2010) showed that high pressures such as a strong workload or time constraints have affected health and well-being results. Shittu et al. (2018) find that more projects are often taken on by vast

numbers of corporate staff and need to be done within a limited amount of time, and Lin, Wong, and Ho (2015) incorporate a mixture of deadlines and more demanding workloads. In the JDR (work- demand-resource) model, Lynch and Wright (2019) state that there are two elements: job specifications and job capital. Job demands, according to them, apply to the low working environment, high job intensity, and interpersonal disputes that make staff and employees frustrated. In addition, burnout and frustration have detrimental implications for the health and career success of workers. In addition, the effects of workload and job fatigue have been investigated by many studies. Fatigue and occupational mistakes as a workload can induce emotional fatigue, according to Poulsen et al. (2016). Yang et al. (2016) supported this and showed that cognitive fatigue plays an important part in the workload.

Other than that, the workforce will consist of varying ages or generations, as we know in the company, and each generation will have different views or perceptions. According to Lin et al. (2015), the workload of generations y, x, and baby boomers would have separate expectations. Generation Y and baby boomers perceive that as the workload gets heavier, their work-life quality will be poorer. Generation x also perceives this thing differently: generation x perceives that their work-life quality will not be compromised by the workload.

Ilies et al. (2015) found that job overload can lead to employee discord in the family. Typically, this dilemma may occur for workers who have a heavy workload and are unable to manage the obligations of work and family. This is confirmed by Molino et al. (2015), who considered the correlation between workload and family dispute to be helpful. More specifically, due to industry competition, the rising workload of workers appears to be a prevalent problem in the workplace. The workload is now becoming a dangerous threat to every company, creating low results for workers. Employees do not meet the appropriate quality to gain competitive benefits due to the heavy workload.

Bruggen (2015) observed that the efficiency of employees would decline if the number of workloads is high, however if there are moderate levels of workload, the employees will demonstrate a high degree of performance. The workload suggested by Lynch and Wright (2019) would place burden on workers, which will affect the efficiency of employees. Simultaneously, one of the causes that would not impact employee productivity favourably is the workload. This argument is endorsed by Alrawahi et al. (2019) in their study which found that workload is another aspect that can influence job satisfaction in addition to task uncertainty and performance stress.

Jex, S. M. (1998) explains the workload as the amount of work that a person has to do. A difference occurs between the real amount of work and the interpretation of the workload by the individual. It is also possible to define the workload as quantitative (the sum of work to be done) or qualitative (the complexity of the work). The workload is the most widely recognised stressor (Li J & Lambert V, 2008). Li et al. (2012) assert that the disproportionate workload of hospital-based Brazilian nurses was also a major contributor to stress. High demands have affected health and safety, such as a heavy workload or time constraint (Nieuwenhuijsen, Bruinvels, & Frings-Dresen, 2010).

2.3.2 Double Duty / Long Hour Duty

Wooden (2000) discovered that the majority of workers (51.2%) worked from 35-40 hours a week in the 1970s. By 2003, only 30.2% of workers worked a regular week. From 28.2% in 1970 to 30.2% in 2003, the percentage of workers worked more than a regular week (41 or more hours) rose. In comparison, between 9 am and 5 pm, only 7% of staff now work all their weekday hours, and less than half of the Australian population works on a schedule from Monday to Friday (Watson et al. 2003). Pressures can be traced back to the overall growth in global corporate pressures for extended working hours.

The conclusion of long hours of work by Allan (1997) and Bakker et al. (2003) could adversely affect the attitudes and activities of workers, such as job satisfaction and attrition. Green and McIntosh (2001) also observed that extended hours of service are likely to decrease the health of workers. Green (2004) stated that the job satisfaction of workers declined during the same time as the pressure to work increased.

Peetz et al. (2003) found that 43% of workers working 'long hours' were more likely to want a position elsewhere. In the following study, we draw on those studies by analysing the influence of prolonged long hours of work on workplace satisfaction and job search behaviour. An employee may be able to put in extra hours on a short-term basis, but over time they may react differently.

This shift was said to be disruptive and may lead to adverse health effects at three levels (especially the night shift); shift duty was known to disrupt body physiology, which was designed to run as a circadian clock in humans. As such, it can be concluded that shift duty may lead to a human biological disorder (Barriball et al. 2012). Mathew (2013) says that research in Nigeria on long hours of service found that nurses serving more than 8 hours were at higher risk of burnout, fatigue, and thus poor work morale.

Healthcare staff, as a collective of health professionals, participate in shift duty, and a 24-hour duty is expected by the essence of their jobs. No person should work round the clock without sleep, according to Abaa et al. (2013), certain occupations involving a 24-hour role must be protected by a scheme of shift duties by various persons, leading to a shift duty structure. This shift was said to be disruptive and can lead to adverse health effects at three levels (especially the night shift); shift duty was known to disrupt 13 body physiology, which was developed to run as a circadian rhythm in man.

2.3.3 On-Call

Increased fatigue, diminished mental well-being, and poor sleep quality can be linked with some indicators of being on call. British general practitioners ranked nights on call as one of the top two most difficult facets of their jobs, according to Sutherland and Cooper (1992). The most commonly reported stressor was on call for Finnish anesthetists; it was closely associated with different symptoms of stress and was the most important cause for sleep deprivation (Lindfors et al. 2006). What makes on-call work more strenuous is that both extended day hours and night work are frequently mixed. Increased stress levels, reduced quality of life, and poorer lifestyles are linked with extended working hours (Maruyama & Morimoto, 1996).

Shift work and, mainly, night work can interrupt sleep patterns and lead to physical and mental health (Nurminen, 1998). For example, long night shifts have been associated with alcohol use among nurses (Trinkoff & Storr, 1998). Physicians on 24 -hour on-call shifts are at increased risk of occupational injury, making severe or even fatal medical errors, and motor vehicle accidents on the drive home (Rubin et al. 1991). The on-call burden may contribute to negative copings, such as an unhealthy lifestyle, which may, in turn, further intensify the harmful effects of the on-call load. Some previous studies have suggested that there are factors in physicians' work that may lead to unhealthy behavior.

2.3.4 Increased of Patient

In a developing country like Malaysia, the way of life and thinking of people has changed dramatically. The current conditions of life make society less attentive to healthcare. This is because people care more about careers than healthcare. The World Health Organization (WHO) says that this lifestyle change has led to an increase in chronic diseases such as diabetes mellitus, hypertension, and heart complications.

The WHO statistics survey indicates that chronic diseases accounted for as many as 60% or 56.5 million of the estimated number of deaths worldwide in 2001. 46 percent of chronic diseases are projected to be a global burden, and the number of chronic diseases is expected to climb to 57 percent by 2020. It is also estimated that 71% of deaths are related to heart disease, 75% to stroke, and 70% to diabetes mellitus. From time to time, increased patients have contributed to an increased workload for all workers, which can lead to a lowered degree of workplace satisfaction and a substantial effect on daily life at the same time.

2.3.5 Shortage of Staffs

The shortage in hospitals and their consequences, particularly the uneven quality of care, have become commonplace. Douglas (2010) suggests that healthcare administrators need to collaborate to develop a viable and sustainable formula for safe staffing. According to Buerhaus et al. (2005), the shortage of nurses in the future is a catalyst for increasing stress on nurses (98 %), lowering patient care quality (93 %), and causing nurses to leave the profession (93 %). When patient needs vary significantly, staffing is more difficult to predict and can increase nurses' workload because staffing may fail to match patient needs. As per Berry and Curry (2012), unequivocal nursing overload negatively affects patient outcomes. There is significant evidence indicating that improved nurse staffing and hours of work reduce medication errors.

2.3.6 Shift Duty

Many improvements in healthcare working processes have been made over the last two decades. The assimilation of shift-work processes and versatility of work patterns has become one of these shifts. Shift duty causes tension in individual nurses, according to Syed and Anisa (2011), and nurses with the stress of shift work manifest it in different ways. Any nurses strive to adapt to it by knowing and being deliberately informed about the intrinsic essence of shift service in nursing. Klopper et al. (2012) characterise the recognition of shift service as a workplace stressor that impacts hospital nurses' work satisfaction. In nurses who served rotating shifts for more than six months, Golubic et al. (2009) observed an improvement in the risk of cardiovascular disorders relative to nurses who never rotated shifts or those who had worked rotating shifts for fewer years.

2.4 Mental Health

According to Nurul Izzah (2011), the mental health level consists of mental health assessment and stress level measurement. Mental health refers to whether an individual is aware of their potential and capable of responding to stress in life and is referred to as an individual who can work and has good social functioning (World Health Organization 2005). According to Mohd Suhaimi and Nur Natasha (2018), individuals with mental health disorders will result in depression, generalized anxiety disorder, panic disorder, obsessive-compulsive disorder, and stress disorder.

According to Mohd Hafis, Mohd Suhaimi, Nasrudin Subhi, Nasrudin Baidi, and Nor Hazlin (2016), mental health problems can be divided into several categories. Among them are stress, anxiety, anxiety, eating disorders, schizophrenia, and domestic violence. Mental health problems usually do not occur on their own unless a person's environmental factors cause the condition.

According to Roslee Ahmad, Mohamed Sharif, and Jamaludin Ramli (2005), mental health is closely related to different social adaptations according to the place and time owned by a person at various levels. Mental health is also defined as the ability of a person to adapt internally between his various motivators and motivators and adapt externally in relation to the environment, which includes living or non-living things.

2.4.1 Occupational / Job stress

According to a study by Golubic et al. (2009), job stress contributes 50-60% to an employees' job satisfaction. Work-related stress is considered hazardous when physical and emotional reactions occur where there is a mismatch between work requirements and capabilities, resources, or work requirements (Mursali et al., (2009). Job stress or work stress occurs when an employee is unable to adjust to an organization's working environment, whereby the capabilities of the employees do not match the needs of the job (Tang, 2010). This can cause employees exhaustion and fatigue and can cause particular employees to quit the organization. Lee and Chuang (2010) indicated that as a result of the employees' response to their work environment, occupational stress could affect an employee's physical and psychosocial.

According to Adaramola (2012), stress at work occurs when the workers' goals do not match the organization's job requirements. Definitions by the National Institute for Occupational Safety and Health (NIOSH 2007) stated that work stress is the harmful physical and emotional responses that occur when the job requirements do not match the workers' abilities, resources, or needs in poor health and even injury. French et al. (1976) defined job stress as any characteristic of the working environment that poses a threat to the individual, either excessive demands or insufficient supplies to meet his needs.

According to Jamal (1990), when an individual is affected by job stress, they tend to deviate from normal behavior, impacting their work performance. Jamal (1990) also found that job stress occurs when a person is not given adequate training or resources to perform the job or is confronted with conflicting job demands. Zafir et al. (2014) found occupational stress is defined as harmful emotional (i.e., worry and depression), physical (i.e., restlessness and infections), and behavioral responses (i.e., job disappointment and poor job performance) that occur when job requirements do not match skill. Job stress refers to employees' feelings or responses when the job demand exceeds their abilities and needs (Nahar, 2013). Beheshtifar et al. (2011) conclude that work-related stress usually affects individual and organizational issues, including employees' behavior, mental health, physical performance, job satisfaction, and organizational commitment to addressing this problem.

2.4.2 Stress induce to Non-Communicable Disease

Stress at work is a major contributing factor to Non-Communicable Disease (NCD). This stress is a significant impact on life in terms of changes in patterns of diet and exercise. According to the CDC, the NCDs are responsible for more than 68% of deaths worldwide and 75% of deaths in low- and middle-income countries. NCDs are often preceded by stress-related metabolic syndrome (hypertension, high cholesterol, truncal obesity, and reduced responsiveness to insulin).

Judge et al. (1993) say that some studies have indicated that shift work can lead to health problems such as metabolic syndromes. Gates (2001) night shift work could significantly affect the sleeping patterns, in the long run, leading to higher cardiac sympathetic regulation. Among the different shift work patterns, night shift work has been shown to bring about more severe health risks. The immediate health crisis in the 21st century

involves stress-related NCDs: coronary artery disease, diabetes, chronic pulmonary and GI diseases, cancer, neuropsychiatric diseases (NPDs), and arthritis (Narayan et al. 2010). The study has shown that chronic fatigue in nurses decreases the quality of patient care and increases the risk of health problems for nurses' such as depression (Gold et al., 1992). Non- Communicable disease has resulted in a low level of job satisfaction and will undoubtedly lead to the decreased work quality.

2.4.3 Role of Supervisor / Organization

Arnetz (1999) argues that in organizations, it can be observed that most employees have problems with their supervisor, who is not giving them the respect they deserve. Supervisors also show harsh behaviors to employees because they are not comfortable sharing excellent and innovative ideas with their supervisors. Furthermore, he describes that top management limits employees to their tasks rather than creating a sense of responsibility in employees by making them work in teams to attain high performance. Another study by Castillo and Cano (2004) on the job satisfaction level among faculty members of colleges showed that if proper attention is given towards interpersonal relationships, recognition, and supervision, job satisfaction will rise.

Support from the employees' immediate supervisor has been found to affect job satisfaction (O'Driscoll & Beehr, 1994). Huebner Study (1994) showed that the existence of one's supervisor's work-related assistance buffered the negative consequences of work tension (role conflict and work overload). Baird and Dei (1976) found valuable beneficial relationships with the boss between work satisfaction scores and frequency of conversation. Satisfaction with Managers According to Wood et al. (1986), this element of work satisfaction measures the degree of job satisfaction based on the expectations of workers how happy they are with their supervisor's knowledge or instructions to fulfil their duties.

2.5 Working Environment

In the modern era, due to the dynamic nature of the environment, organizations face multiple challenges. One of the many challenges for a business is to satisfy its employees to cope with the ever-changing and evolving environment and achieve success and remain competitive. To increase employees 'efficiency, effectiveness, productivity, and commitment to work, the business must meet its employees' needs by providing the right working conditions. Spector (1997) found that most firms disregard the working environment of their company, which damages the efficiency of their workers. According to him, the work environment consists of the welfare of workers, job safety, strong employee relations, appreciation for good success, encouragement to do well, and involvement in the decision-making process of the company. He further clarified that as workers understand that they are important to the organisation, they will have a high degree of loyalty to their organisation and a sense of ownership.

Robbins (2001) argues that working conditions will affect job satisfaction, as employees are increasingly concerned with a comfortable physical work environment. Instead, this will lead to a more favorable level of job satisfaction. Arnetz (1999) suggests that in organisations, it can be found that workers often have disputes with their boss, who may not owe them the respect they deserve. Supervisors often exhibit workers harsh actions because they are not happy discussing outstanding and creative thoughts with their supervisors. Furthermore, he states that top management restricts workers to their responsibilities rather than building a sense of accountability for employees and making them work in teams to achieve good results. Petterson (1998) suggests that the engagement of workers within a company is essential to the accomplishment of corporate objectives. He further describes the need to properly communicate information on time so that the business operations are running smoothly. If there is a clash between colleagues, then the organizational goals are challenging to achieve.

The work environment concept is a comprehensive concept, including physical, psychological, and social aspects that reflect the working conditions. The working environment works for the employees' personality and health to be positive or negative (Salunke, 2015). Workforce management has become more difficult in the modern era because employees are highly skilled and aware of their rights while working in an organization. Therefore, the organizations must identify their employees' needs and satisfy them to ensure that their goals and objectives are effectively achieved. Healthy working climate increases the loyalty, degree of engagement, performance, efficacy, competitiveness of workers and provides a sense of ownership among employees that eventually increases corporate efficiency and decreases the cost of banning resulting from unsatisfied employees.

2.5.1 Relationship Between Co-Workers

Job Satisfaction is an essential component for employees' motivation and encouragement towards better performance. Manytoe defined job satisfaction over the years. Clark (1997) claims that if employees are not happy with the role assigned to them, considerations such as their rights are not certain, workplace environments are dangerous, co-workers are not friendly, the employer does not value them, and they are not taken into consideration in the decision-making process, resulting in them becoming separate from the organisation.

Spector (1997) noted that most organisations neglect the workplace climate within their organisation, resulting in a detrimental impact on the success of their workers. The working atmosphere, he says, consists of staff safety, workplace security, positive relationships with co-workers, appreciation of good success, encouragement to do better, and involvement in the decision-making process of the organisation. He also clarified that

as workers know that the corporation finds them essential, their organisation will have a high degree of dedication and ownership.

It is possible to describe assistance from co-workers as the level of co-help and their reliability to assist another employee. Mutual trust and compassion can be created by the partnership between staff and their co-workers. This would help them to learn more about their relational and psychological interactions as co-worker trust, as co-support will improve employee engagement (Patwary et al., 2019). Employees who have earned co-worker support appear to experience a high level of professional accomplishment. This fact was confirmed by Charoensukmongkol et al. (2016), who found that supporting colleagues can improve personal achievement while helping to prevent emotional fatigue and depersonalization.

Satisfaction with co-workers is the dimension of perceived job satisfaction, which determines how an employee perceives his/her job accomplishment by the support or the presence of his/her co-workers' attitude and behavior such as selfishness, friendly or supportive (Purani & Sahadev, 2007). Most of the things that the company wants to take care of is a partnership with a co-worker. It would increase the level of work among the workers, according to Purba (2017), and thereby directly affect the happiness of the employees in positive ways.

2.5.2 Communication

Relatively few studies on the communication - to - job satisfaction relationship until the mid-1970s explored communication variables as contributors to job satisfaction (Daly et al., 1977). Petterson (1998) argues that the interaction between employees within a business is crucial for accomplishing the organizational goals. Furthermore, he describes

that the communication of information must be done appropriately on time so that the business's operations are running smoothly. If there is a clash between co-workers, it isn't easy to achieve the organization's objectives.

Chandrasekar (2011) argues that an organization needs to pay attention to create a work environment that enhances employees' ability to become more productive to increase profits for the organization. He also argued that human interactions and relations play a more dominant role in overall job satisfaction than money. In contrast, management skills, time, and energy are needed to improve the organization's overall performance in the current era. The concern with communication within all types of organizations has increased markedly over the last decade. Most researchers and professionals intuitively believe that a communication environment that is perceived positively contributes substantially to organizational effectiveness.

As more attention is focused on the presumed value of organizational communication, and more funding is allocated to support it, researchers are stepping up their research into these complex relationships (Hellweg & Phillips, 1981). Organizational management has sought to improve worker's performance/productivity by increasing employee's participation in workplace decisions in the face of rising inflation and aggressive foreign competition. With this emphasis on increasing labor-management cooperation, questions have arisen regarding communication contribution to organizational performance. Despite technical differences in job performance and productivity, they are frequently used interchangeably (Downs & Hain, 1981). They also found the factors often associated with productivity or efficiency, especially communication-related factors, tend to differ across organizations and organizational levels.

2.6 Theory Hierarchy of Maslow

Abraham H. Maslow was born in New York in 1908. He was a well-known psychologist with a theory of the level of human needs. His approach has greatly influenced the fields of study of human psychology, social sciences, sociology, and politics. Apart from that, Maslow's theory of needs is also often applied internally in economics and education. Maslow has introduced the humanistic human development approach (Nor Nazimi, Jaffary & Aminudin, 2017). Matters related to human beings individually and the environment are the basis of humanistic theory and focus on self-awareness within the individual, the uniqueness of self, and the importance of other human beings towards the individual.

According to Maslow, the development of human life is guided by the result of human need itself. Every human being has basic needs that need to be met to build self-motivation to achieve satisfaction. This is in line with the hierarchical theory of requirements introduced by Maslow. He details that the human soul will be disturbed if human needs are not met. According to Nor Nazimi, Jaffary & Aminudin (2017), a human being is a conscious body with an ideal feeling and purpose.

Individuals who do not have or lack self-esteem will be shrouded in low self-esteem and lead to despair and lousy behavior (Maslow 1954). Individual self-confidence will increase and become more productive when the individual has met the needs of self-esteem. Maslow has developed and built a pyramid theory of human needs through the basic level of needs and goals of an individual.

Figure 2.1: Hierarchy of Maslow needs

2.7 Mental Health Assessment Tools

Mental health appraisal methods are classified into two groups, which, with their corresponding pros and cons, are discretionary assessments and quantitative measures. The screening approach and ranking scales for a subjective-based mental health assessment. When evaluating for less disruption, this approach is a moderate strategy that is easy to coordinate. However, because this instrument requires a subjective person, it depends on the memory and state of mind of the respondent when answering the questionnaires.

In the other hand, the category of objective variables consists of metrics affected by various kinds of dimensional mental workload. The concerns are fabricated in this approach by assuming that mental workload is reflected in the decrease in job efficiency. The emotional workload is also found as the individual adds a secondary assignment to the current task. It can be measured as a deterioration of mental workload as the efficiency of secondary production decreases. The constraint of the instrument of objective measurements is artificial and invasive (Marinescu et al., 2016).

2.7.1 DASS-21

The Depression Anxiety Stress-Scale (DASS) is a well-established tool for screening the relative severity of symptoms associated with depression, anxiety, and stress in adults (Lovibond & Lovibond, 1995). It is a self-report questionnaire with twenty-one (21) questions consisting of seven (7) elements per subscale: depression, anxiety, and stress. In 1995, Lovibond's original DASS had forty-two (42) questions that were later condensed to twenty-one (21) questions.

Antony et al. revealed that the DASS accuracy is found in DASS-21, and the concurrent validity of both DASS and DASS-21 is reasonable to excellent scale range (Antony et al., 1998). Many researchers performed several studies to confirm DASS's reliability and validity (Beaufort et al., 2017; Dreyer et al., 2019; Kaur et al., 2014; Oei et al., 2013) have stated that DASS generates distinct characteristics of depression, physical enthusiasm, and psychological irritation.

2.7.2 CarMen-Q

Carga Mental Questionnaire (CarMen-Q) is a newly developed instrument by researchers from Spain to assess and diagnose the mental workload. As the person applies a secondary assignment to the current job, the emotional burden is also established. If the productivity of secondary development reduces, it can be measured as a worsening of mental workload. The limitation of the objective measurement device is artificial and invasive (Marinescu et al., 2016). In addition, CarMen-Q has been used in the workplace as a contemporary mental health evaluation tool that is accurate, simple to instal, and effective assessment tool. It was constructed on the basis of ideology established by the Mental Workload model of Hart & Steveland in such a way that the mental workload calculation must be multidimensional and related to the task's characteristics, including physical, mental, temporal needs, output and emotional effects relative to task demand (Chiorri et

al., 2015). A group of researchers found vulnerabilities in NASA-TLX, in which the practical value of output metrics is constrained and affected by the physical load (DiDomenico & Nussbaum, 2011). CarMen-Q is designed to reliably and definitively calculate mental workload calculations by strengthening this limitation and removing physical load parameters (Rubio-Valdehita et al., 2017). For most organisations, independent of any field, it has become important to determine mental workload as a necessity to experience any workplace adverse effects among employees.

2.7.3 Research Hypothesis

Based on the research questions and the research objectives, the following research hypotheses have been developed. The study predicts the following outcomes;

Hypothesis 1:

Null hypothesis:

Ho: There is no linear relationship between high mental workload on mental health status among staffs at Pathology Department.

Alternative hypothesis

Hi: There is a linear relationship between high mental workload on mental health status among staffs at Pathology Department.

Hypothesis 2:

Null hypothesis:

Ho: There is no linear relationship between high mental workload on job satisfaction among Pathology Department staffs during pandemic COVID-19.

Alternative hypothesis

Hi: There is a linear relationship between high mental workload on job satisfaction among Pathology Department staffs during pandemic COVID-19**.**

2.8 Summary of The Literature

This chapter has reviewed the literatures on the workload, mental workload, mental health status, work stress, work environment, job and shift duties, patient factors, chronic and adverse health effects, research instruments, job satisfaction, and significant psychology theories. Here, based on the content and outline from the previous literatures, findings and discussions show the relevance of this research project and its possible relationship with these variables. Thus, the previous studies can inter-connected these independent variables with potential variables in line with these research questions and objectives. In conclusion, based on the literature contents, there is a significant workload and mental workload level in every organization contributed by various factors that impacted employees' abilities, performance, and capacities. Thus, most of the studies show those potential elements such as work natures and cultures, workloads, the complexity of tasks, environments, organizational behavior, etc., may significantly impact workers' health conditions, performance, and profiles. This chapter also presents the research hypotheses tested in this study. The next chapter will discuss the research design and methodology related to the study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter will describe the research method used in this study. The first section of this chapter will describe the research design, the population, the instrument chosen to address the problem and meet the study's objectives. The second section will explain how the design and the research instrument used to collect the data. Finally, this chapter will present the measurement model results, issues of reliability, and validity.

3.2 Research Design

According to Leedy and Ormrod (2010), research designs can be defined as "a set of guidelines and instructions to be followed in addressing the research problem". Research design's primary function is to allow the researcher to foresee appropriate research decisions to maximize the validity of the eventual results. There are three types of research design in research: exploratory, descriptive, and causal (Hair et al., 2007). This study was carried out using a descriptive method. According to Sekaran (2003), descriptive research is suitable at any time with the research being conducted because it helps to give future research perspective. This is further supported by Cavana, Delahaye, and Sekaran (2000), who stated that a descriptive study is best suited to gaining a better understanding of the issue, using structured data collection systematically.

The method of research can be divided into quantitative and qualitative. This study was systematically conducted to find answers to research questions and was conducted in a cross-sectional quantitative manner, where descriptive questionnaires were used to collect data. Mouton (2010) identifies research design as the strategy or blueprint of the requirements for data processing and collection in a way that attempts to integrate significance with the economy of processes for the research purpose. Aliaga and

Gunderson (2002) stated that quantitative research collects numerical data analyses using methods based on mathematics (especially statistics). This method is chosen because it allows the researcher to measure the relation between constructs of the research. Quantitative research, according to Creswell (2003), provides for a better understanding of the factors that influence an outcome. This is why quantitative research design is chosen for this study because statistical methods can be used to test the relationship between variables.

This study aims to determine the level of mental workload and its relationship to employees' mental health status and job satisfaction. This study opted to use the survey questionnaire to gather quantitative information. The survey questionnaire was composed of closed-ended questions and a likert scale compared to interview-administered surveys. This is because, as Spunt (1999) suggested, self-administered surveys are more convenient and less expensive to administer, eliminate interviewer bias, give privacy to respondents, and the results can be analyzed more quickly. The questionnaire survey allows researchers to research a large sample that can be spread to the whole population. The survey questionnaire also uses close-ended questionnaires so that the respondent's scope response can be controlled by the investigator. This is done because the researcher wants to ensure the study is valid and reliable without any unbiased error (Creswell, 2003).

3.2.1 Research Design

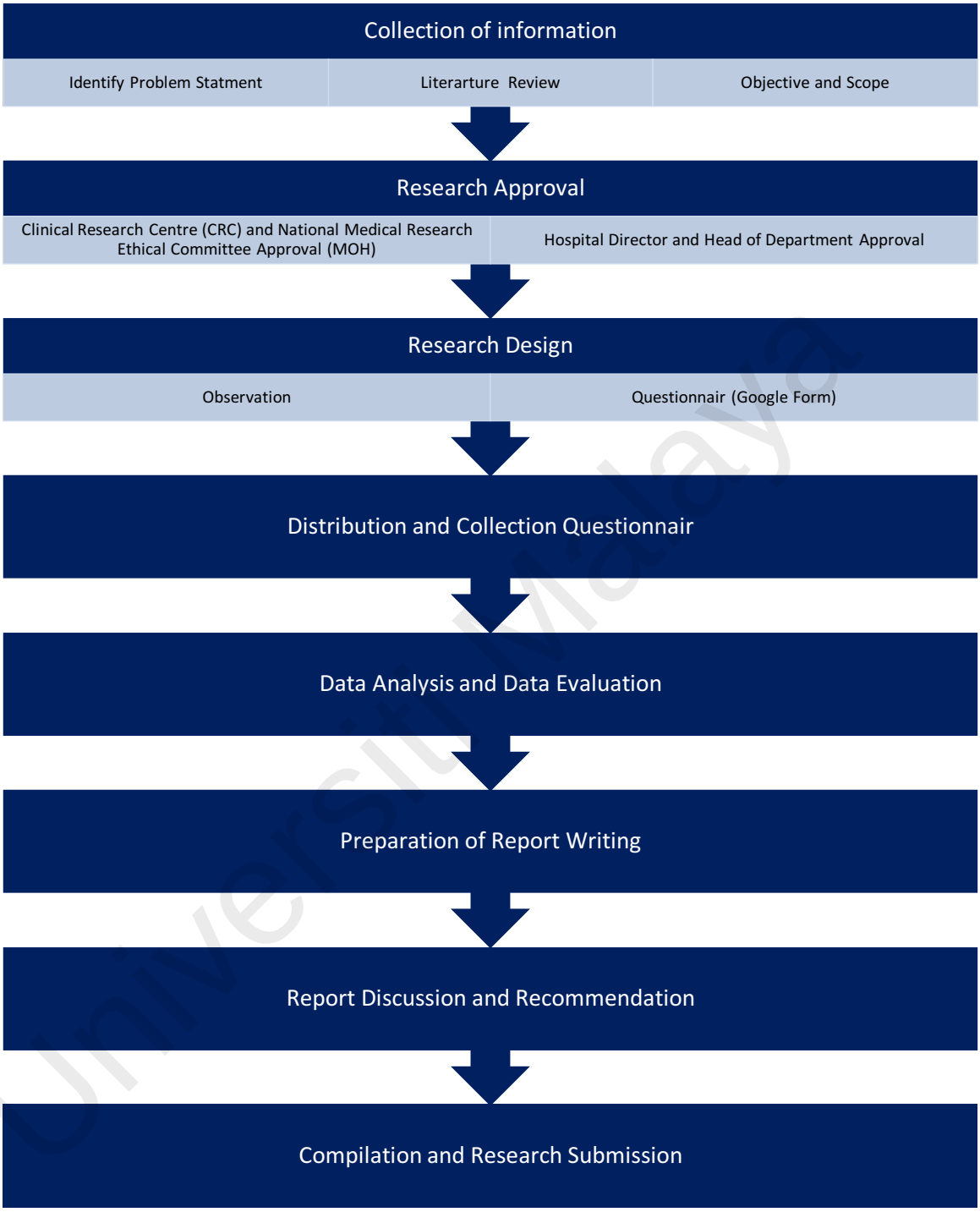


Figure 3.1: Research design

3.2.2 Research Conceptual Framework of The Study

Camp (2001) explains the framework for the research study was defined as the structure to explain the natural phenomenon's development to be studied. It explains clearly how the research problem will be explored.

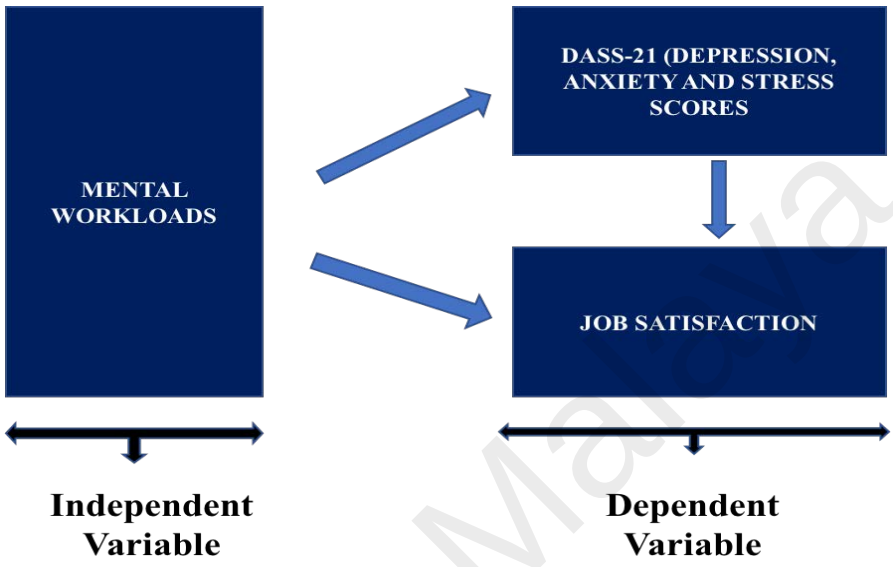


Figure 3.2: Research conceptual framework of the study

3.3 Population

Population is defined as an entire group of people, events or things that researcher used to test the hypothesis in their investigation (Sekaran, 2003). Population could be people, places, objects, and cases that a researcher wants to make inferences, according to Cooper and Schindler (2014). The actual specification of a sample must begin with the identification of a population to be investigated, based on Alreck and Settle (2005). In addition, Alreck and Settle (2005) also note that the researcher must predict judgments that are likely to occur during the actual collection of the survey and that the respondents must have the data and must have certain characteristics or features to make their answers relevant. Sekaran (2003) argues that it is important to have accurate sampling in terms of shape and size as it helps researchers to examine and conclude the results of the findings.

This study was conducted in order to identify whether there is a relationship between level of mental workload with other dependent variables such as mental health status *(depression, anxiety and stress)* and level of job satisfaction among Pathology Department staffs at Hospital Tunku Azizah. The selection of the Hospital Tunku Azizah is because it is the largest National Women and Children Hospital in Malaysia with capacity of 600 bedded with total manpower of 2080 workers from different medical professions. Thus, Pathology Department consider most suitable scope of studies due to these departments consist of varies medical profession and it is appropriate for this study population. The total population (Pathology Department Staffs) of this study is 85 from 95 workers based on the sampling population table by Krejcie Morgan (1970). Respondents of this study are among Pathologist Physician, Genetics Physician, Medical Officer, Science Officer (Scientist), Medical Laboratory Technologist and Hospital Attendant.

3.4 Sample Size

Sample size is an essential aspect of any observational analysis aimed at drawing conclusions regarding the sample population (Bartlett et al., 2001). A well-defined sample size is still needed elsewhere to reduce sample error rates. Cooper and Schindler (2006) stated that sampling is the process of selecting certain elements from a population so that they represent the population. According to Creswell (2008) sample is the subset of the population which is studied in order for the research to be generalized on the overall population of study. Predicting random samples and avoiding sampling or biased errors, random samples need to be of sufficient size (Brymen & Bell, 2003). It is vital to have a proper sampling design and sampling size, as this helps the researcher properly examine and conclude the finding result (Sekaran, 2003).

To ensure that the level of confidence, accuracy and error of sample size can be minimized and also to determine sample size for a particular population, the sample size table of Krejcie & Morgan (1970) was used for this study. Therefore, for a population of 95 workers, 76 samples were considering as sufficient sample size for this data analysis. The fact is, researcher able to recruits 85 respondents with good collaboration by the department. Here, this sample size is also consistent with Roscoe's practice rules (cited in Sekaran, 2010) which states that samples larger than 30 and less than 500 are appropriate for most studies. Sample selection will result in a more successful outcome due to reduced fatigue and potential errors from the collected data, especially when a large number of elements are involved (Sekaran, 2003).

3.5 Sampling Technique

Stratified random sampling, according to Ackoff (1953), is where the population is separated into strata (or subgroups) and each subgroup is drawn from a random sample. A natural set of objects is a subgroup. Subgroups can be dependent on the scale of the company, sex or profession (to name but a few). Stratified sampling is also used where within a population there is a great deal of difference. Its aim is to ensure adequate representation of any stratum.

In this study, the method of respondent selection determined through stratified random sampling. The method used is the simple random sampling. Simple random sampling is a sampling procedure that allows for an equal and independent chance for each individual in the defined population to be included in the sample (Zikmund, 2003). This method is selected because of: a) it is free from errors in classification; b) requires the least advanced knowledge of the population other than the framework; c) its simplicity also facilitates the relatively easy interpretation of data collected in this way; d) it does not favor any

part of the population. They were assured that the collected data would be confidential and that they were entitled to withdraw from the study at any time they wished without any force put on them.

Simple random sampling was chosen for the above reasons, where only minimal advance population knowledge is required. It is also easy to analyze data and compute error. Each customer care officer has an equal chance of being selected that can increase the research's accuracy, relevance and credibility. There are multiple ways of creating a simple random sample. These include the method of lottery using a table of random numbers, using a computer, and sampling with or without replacement. The sample size of the study according to the schedule set by Krejcie and Morgan (1970) was 75 or more and the selection of the respondents was based on stratified random sampling method.

3.6 Questionnaire Design

The instrument of study is the measuring instrument used in determining the data and information that is required to be obtained or not. Cresswell (2008) pointed out that information regarding the research instruments used by previous researchers is an important factor in designing a study for the purpose of collecting the available data. The study was conducted quantitatively and the research instrument to be used in this study was a questionnaire.

The questionnaire used in this study provided the feedback regarding mental workload, mental health status (*depression, anxiety and stress*) into the factors that influence the level of job satisfaction among healthcare workers at the Pathology Department Hospital Tunku Azizah. There are three main variables studied is this research which are mental workload, mental health status (*depression, anxiety and stress*) and job satisfaction

involving satisfaction on workload, work-stress, working environment and general job satisfaction. The questionnaire for this study be conducted in bilingual (Bahasa Malaysia and English languages) as the respondents are comprised of professional and support groups 1. There are three major instruments used for this research. In this research study, Carga-Mental Questionnaires (CarMenQ), DASS-21 and Job Satisfaction Survey (JSS) were utilized to determine the level of mental workload and its results towards mental health's status and job satisfaction among workers during this pandemic COVID-19. Again, in measuring mental workload, researcher is using CarMen-Questionnaire by Rubio-Valdehita, S., López-Núñez, M. I., López-Higes, R., & Díaz-Ramiro, E. M. (2017). While for mental health assessment, DASS-21 (*depression, anxiety and stress scales*) is established questionnaire to be use as second instruments and lastly for job satisfaction, an instrument developed by Spector (1994) and used by Zhang et al. (2012) was adapted. The instrument is called Job Satisfaction Survey (JSS Survey) by Paul Spector (1985).

The questionnaire consisted of 4 sections. Section A is a question for Demographic Data (name, age, gender, marital status, job designation, educational level, service period and total working hours per week. Section B are meant for mental workload assessment by using CarMen-Question, section C focusing on mental health effect by applying DASS-21(depression, anxiety and stress scale) and finally section D are related to job satisfaction derived from Job Satisfaction Survey (JSS). All three tools including the demographic data were run via online to take account the physical distancing measure during the COVID-19 outbreak.

3.6.1 Mental Health

To measure the variables of mental health studies, researchers chose to use Depression Anxiety Stress Scale-21 (DASS-21) introduced by Peter Lovinbond (1995) and is a frequently used research instrument to measure the level of depression, anxiety and stress among individuals. DASS- 21 measures the level of depression, anxiety and stress of respondents based on three different dimensions namely depression, anxiety, and stress. DASS-21 consists of 21 items and this instrument measures the frequency of statement of an item occurs based on the Likert scale from the value of 0 to 3. The value of 0 is the lowest value where the respondent does not directly experience what is stated in the statement of the item. While value 3 is the highest value that describes the respondent experiencing the statement submitted in the item on a daily basis. Of the 21 instrument items study, seven items measure the dimensions of depression, seven items measure the dimensions of anxiety and seven more items to measure the dimensions of stress.

The questionnaire was translated into Malay version by Ramli Musa, and Zaini Mohd Zain Ariff (2007) will be used to facilitate understanding of various nationalities and academic qualifications vary. According to a pilot study conducted by Ramli Musa et. al (2007), the DASS-21 item in the Malay version, it was found that the value of Cronbach's alpha for each dimension is also at the desired level, which is the dimension of depression, its value is 0.84, 0.74 and dimension of concern is the dimension of stress is 0.79. Thus, despite being translated in English, with a Cronbach's alpha value is high, the test device has a high validity and reliability and is suitable for measuring the incidence of stress among Malaysians.

Table 3.1: (Source of Coefficient Alpha Cronbach for Mental Health)

Source	Dimension	Total Item	Subscale Question for Mental Health	Coefficient value for Alpha Cronbach
Peter Lovibond. (1995)	Depression	7	1,6,8,11,12,14,18	.84
	Anxiety	7	2,4,7,9,15,19,20	.74
	Stress	7	3,5,10,13,16,17,21	.79

Source: Translation, Validation and Psychometric Properties of Bahasa Malaysia Version of the Depression Anxiety and Stress Scales (Ramli Musa et al. 2007)

Mental health is assessed by looking at the level of each dimension of mental health, namely depression, anxiety and stress. Scores for each item for one dimension are summed and viewed based on the screening score to determine whether the respondents are at normal, mild, moderate, severe or very severe levels.

Table 3.2: Score Mental Health Screening

	Screening Score		
	Depression	**Anxiety**	**Stress**
Normal	**0 - 5**	**0 - 4**	**0 - 7**
Mild	**6 - 7**	**5 -6**	**8 - 9**
Moderate	**8 -10**	**7 - 8**	**10 - 13**
Severe	**11-14**	**9 -10**	**14 - 17**
Very Severe	**15 +**	**11 +**	**18 +**

Source: Translation, Validation and Psychometric Properties of Bahasa Malaysia Version of the Depression Anxiety and Stress Scales (Ramli Musa et al. 2007)

3.6.2 DASS-21

Depression Anxiety Stress-Scale (DASS) is a well-established tool applied among clinical and non-clinical samples of adults to assess the perceived severity of symptoms associated with depression, anxiety and stress (Lovibond & Lovibond, 1995). It is a type of self-report questionnaire with twenty-one (21) questions consisting of seven (7) items per subscale which are depression, anxiety and stress. The original DASS by Lovibond has forty-two (42) questions was published in year 1995 which was later simplified to twenty-one (21) questions.

Antony et al. revealed that the consistency of DASS is observed in DASS-21 and the concurrent validity of both DASS and DASS-21 are in acceptable to excellent scale range (Antony et al., 1998). Numerous studies conducted by many researchers to validate the reliability and validity of DASS (Beaufort et al., 2017; Dreyer et al., 2019; Kaur et al., 2014; Oei et al., 2013) reported that DASS produces distinct characteristics of depression, physical arousal and psychological irritation.

3.6.3 Carga-Mental Questionnaires

CarMen-Q stands for Carga Mental Questionnaire, a modern method for mental health testing that is meant to be valid, easy to deploy and reliable in the actual workplace assessment tool. It was built on the basis of ideology developed by the Mental Workload paradigm of Hart & Steveland in such a way that the measurement of mental workload must be multidimensional and linked to the characteristics of the task, including physical, mental, temporal, output and emotional consequences relative to task demand (Chiorri et al., 2015). CarMen-Q has 29 question sets, split into four dimensional question sets. There were 10 cognitive demand questions, 7 temporal demand questions, 7 emotional demand questions and 5 performance demand calculation questions generated by strengthening

this constraint and eliminating physical load criteria to achieve real and definite mental workload measurements (Rubio-Valdehita et al., 2017).

3.6.4 Job Satisfaction Survey Instrument

The development of the Job Satisfaction Survey (JSS), a nine-scale measure of employee's job satisfaction specifically applicable to organizations in the human, public, and non-profit sector, is described. Also described are item selection, item analysis, and final 36-item scale determination, and data on reliability and validity and the standards of the instrument are summarized, included is a JSS and Job Descriptive Index (JDI) multitrait-multimethod analysis, JSS factor analysis, and inter-correlations of scale. The correlation of JSS scores with employees' perception criteria and multi-sample behaviors was consistent with findings involving other satisfaction scales, as well as private sector findings. There were more modest correlations with salary, age, level, absenteeism and turnover. This adapted instrument from JSS Survey which was conducted to evaluate job satisfaction among the staffs of Pathology Department Hospital Tunku Azizah. The questionnaire consisted of 4 sections which is Section A for Demographic data, Section B for CarMen-Q, Section C for DASS-21 and Section D for Job Satisfaction Survey (JSS). Out of the 36 original questions contained in the JSS by Spector (1985), only 24 questions were selected as meeting the criteria of the dependent variables as a satisfaction on workload, work stress, working environment and general job satisfaction. The 24 questions that meet these criteria were refined in the order of the sentences to be better understood by the respondents. To measure every variable and the easiest way to get answers from the respondents, the Likert 4-point scales ranging from (1) strongly disagree to (4) strongly agree to be used. These selected questions will be analyzed further in chapter 4 in the descriptive analysis of items independent variable. Table 3.3 below lists the source for this study of the questionnaire design.

Table 3.3: Original and Translated Version Items of the Job Satisfaction Survey

Original Version (36 item)	Adapted Version (23 Item)
	Workload Item
I have too much paperwork.	I have too much documentation at work.
I have too much to do at work.	I have too much task to do at work.
Staff ratio and workload are reasonable.	The ratio of patient to staff is reasonable.
The work provided is affordable.	The amount of workload that my supervisor expect from me is reasonable.
	Patients and family have high Expectation of the treatment Provided.
	Work Stress Item
Many of our rules and procedure make doing a good job difficult.	I have to follow a lot of rules and procedure in making the work more difficult to complete.
Work assignments are often not fully explained	Work assignment are not fully explained and brief by the supervisor.
I find I have to work harder at my job than I should because of the incompetence of people I work with.	I find I have to work harder than I should because of the Incompetence of people at work place.
I feel burdened with my work.	I feel tensed/stressed with my Job.

Table 3.3, continued: Original and Translated Version Items of the Job Satisfaction Survey

Original Version (36 item)	Adapted Version (23 Item)
	Working Environment
I enjoy my co-workers.	I enjoy my co-workers.
My effort to do a good job ae seldom blocked by red tape.	My effort to performed a good job are seldom against by my officemate.
I enjoy my co-workers.	
I like my supervisor.	I like my supervisor.
My supervisor is quite competent in doing his/her job.	My supervisor is quite Competent in doing his job.
When I do a good job, I received the recognition for it that I should receive.	When I do a good job, I received the recognition for it that I should receive.
I like the people I work with.	I like the people who I work with.
Communications seem good within this organization.	Communications seem good within this organization.
My supervisor shows too little interest in the feeling of subordinates.	My supervisor shows too little interest in the feeling of subordinates.
Those who do well on the job stand a fair chance of being promoted.	Those who do well on the job stand a fair chance of being promoted.
There are a few rewards for those who work here.	There are a few rewards for those who work here.

Table 3.3, continued: Original and Translated Version Items of the Job Satisfaction Survey

Original Version (36 item)	Adapted Version (23 Item)
	Job Satisfaction Item
I feel of sense of pride in doing my job	feel of sense of pride in doing my job.
My job is enjoyable.	My job is enjoyable.
I like doing the things I do at work.	I like doing the things I do at work.
I do not feel that the work I do is appreciated.	I do not feel appreciated at work.
I sometimes feel my job is meaningless.	I sometimes feel my job is meaningless.
Source: Zhang et. al., (2012)	

3.7 Pre-Testing Instrument

Many researchers have stated that researchers will maximize the results of their research by establishing clear and accurate pre-testing objectives, (Dillman, 1978; Frey, 1989; Converse & Presser, 1986). Prior to conducting the actual survey, preliminary questionnaires were designed for pretesting purposes by asking the expert to read and proceed and see if any ambiguity that the investigator might not notice may be included in the draft.

To achieve the desired research objectives, two (2) specialists were selected for the purpose of reviewing pre-testing instruments namely a Professor and Pathology Specialist at the University Malaya and Hospital Tunku Azizah level. According to Dillman, Redline and Carley-Baxter (1999) and Yaghmale (2003) they examined the quality of the survey instrument for verbal validity, format, clarity, simplicity and ambiguity of the question items based on the criteria outlined above and has been included in the appropriate study instrument to maximize their results by establishing clear and accurate pre-test objectives.

3.8 Pilot Study

Stewart (2004) defined that the pilot study can be defined as a small study to test the data collection instruments, research protocols, research techniques, sampling strategy, and others in preparation for a larger study. According to Lancaster et al. (2004), the pilot study is one important stage in a research project. It was carried out to identify the lack of research instruments, and problems that may arise and protocol prior to the implementation of the fully research. The scale was originally developed from other countries, so Malaysian respondents may respond to the questionnaire in different ways and in their current state of mind, so that the reliability, internal consistency, and validity of the instrument discrimination can be determined through this pilot test. In this study, pilot studies are conducted by recruiting ten respondents among Medical Laboratory Technologist.

3.9 Data Collection Procedure

All studies to be carried out in hospitals and health facilities under the Ministry of Health Malaysia must obtain the approval from National Medical Research Registry (NMRR). A letter of authorization to study from the university must be included with the application for NMRR. The duration of NMRR approval is approximately 6 - 8 weeks. The date for data collection expected to be perform between October to November 2020. The highest form of guarantee offered to respondents is that all data presented will be handled at all times during the research cycle with utmost secrecy and reverence. The selected respondents will be asked questions related to this study and must be able to answer all questions honestly and sincerely.

The focus of this study examined determine level of mental workload and its relationships on mental health status and job satisfaction among Pathology Department Staffs at Kuala Tunku Azizah. In August and September 2020 prior to the data collection from the Hospital Tunku Azizah, a letter of approval for research and data collection has been submitted to Hospital Director, Clinical Research Center (CRC) HTA and Medical Research Ethical Committee (MREC) by MOH. In the middle of October 2020 Questionnaires were circulated following approval from the Hospital Tunku Azizah Director and CRC HTA. To encourage the participation of respondents in answering the questions they were assured that their answers would be kept confidential and would not be disclosed to any unscrupulous parties. With the current digital facilities, the dissemination of the questionnaire was conducted using Google Form and link will be sent via WhatsApp Messenger to all respondents from Pathology Department HTA. Respondents were not allowed to answer the question more than once. Out of 95 staffs Pathology Department, 85 respondents were participated and answer the questionnaire. According to the schedule set by Krejcie & Morgan (1970), the sample size of the study needed 73 or more respondents depending on the population of employees.

3.10 Data Analysis

The response rate, demographic profiles of frequency statistics of the respondents, reliability analysis, descriptive analysis and Pearson correlation analysis were performed using the software Statistical Package for Social Science (SPSS) version 21. SPSS is a software product used for statistical analysis. SPSS is a software product used for statistical analysis. SPSS is capable of handling large amounts of data and can perform all of the analyses covered in the text and much more. The program, originally called Statistical Package for the Social. Statistics programs in the social sciences, including in healthcare, government, market research and surveying. SPSS was chosen because of its compatibility with most other software packages and its user-friendliness used for data analysis (Field, 2009).

3.10.1 Descriptive Analysis

Descriptive analysis is one of the techniques used to summarize big data from target or sample respondents (Hair et al., 2007). Descriptive statistics are data analysis by percentage, frequency and by using Measure of Central Tendency (MCT) - mean, mode and median. Descriptive research is used, according to Coakes and Steed (2007), to explore, summarise and explain the survey data gathered. Using descriptive analysis, demographic data from the survey may be represented. The style of data analysis in descriptive statistics frequently includes bivariate analysis using only one variable. For variables such as work experience and age, mean, standard deviation, minimum and maximum values can be used to visualize the data. For variables such as gender, race, job type, and marital status, frequency analysis can be used to interpret data. Percentage of sample frequency can also be obtained.

3.10.2 Inferential Analysis

Inference analysis is the most appropriate method to explain the hypotheses (Hair et al., 2006), Inference analysis examples to be discussed below is reliability testing and correlation.

3.10.2.1 Reliability Test

Cooper (2003) has defined the internal consistency reliability as a representative of the homogeneity of the items in the sizes indicated. Reliability is a measure of the internal consistency of indicators. conducted by Zikmund (2003) reliability is a measure of error-free measures, so that consistent and similar results can be obtained.

Consistency shows how well the items that measure the concept are combined as a set. Zikmund (2003) argues that a measurement is reliable when different attempts at measuring something give the same result. Instrument consistency reliability analysis was performed using Cronbach's Alpha. As quoted from Sekaran (2003) reliability less than 0.6 is considered poor, which must be accepted more than 0.7 (Nunally 1978). Over 0.8 is good and over 0.9 is very good. Table 3.5 shows the reliability scale according to Hair et al. (2003).

Table 3.4: Reliability Scale

Alpha Coefficient Range	Strength of Association
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very Good
> 0.9	Excellence

3.10.2.2 Correlation Analysis

Pallant (2005) argues that correlation analysis is a statistical method that describes the strength and direction of linear relationships between two variables. Coakes and Steed (2007) found the Pearson correlation used to test the relationship between dependent and independent variables. In this study, the researchers will identify the strength and direction of the relationship between total mental workload, mental health status (*depression, anxiety, stress*) and job satisfaction among the Pathology Department staffs during this pandemic.

Pallant (2007) states that Positive or negative correlations can be identified by measuring strength. Correlation level measures the strength and importance of the relationship between variables. Correlation analysis is performed when the researcher must explain the direction of interconnection between the variables. Correlations indicate positive interconnections when one variable increases and another increase, whereas negative interconnection is observed when one variable increases and the other decreases.

This study used Pearson correlation to test the relationship between variables. Pearson's correlation coefficient, r, represents the estimation of the linear relationship strength and its direction between intervals and ratio variables based on sampling data, varying in the range of +1 to -1 (Cohen, 2001). In other words, if the result showed +1.0, interpretation indicates the value as perfect positive correlation meanwhile, if result -1.0 indicates the value as perfect negative correlation (Morgan & Leech, 2009). The closer the coefficients value to 1.0, the stronger the relationship between the two variables. For significance values (p), acceptable values are either 0.01 or 0.05 (Coakes & Steed, 2007). Table 3.6 shows the strength of relationship as suggested by Davis's Scale Model.

Table 3.5: Strength of Correlation

Very weak	Weak	Moderate	Strong	Very Strong
0.00 – 0.20	0.30 – 0.40	0.40 – 0.60	0.60- 0.80	0.90-1.00

Source: Salkind 2009

3.11 Chapter Summary

In conclusion, this chapter explains the research strategies and methods used in this study. It explained how the sample of the organization was obtained, how the respondents were selected, how the questionnaire, research materials and survey procedures were developed. This chapter also explains how some of the analyses will be used for the purpose of this study. The results of the investigation will be reported in chapter 4.

CHAPTER 4: RESULT AND ANALYSIS

4.1 Introduction

The purpose of this study is to determine whether mental workload among the Pathology Department staffs influenced the mental health status and job satisfaction among them. It identifies the findings of the descriptive analysis of the respondents and the mean of each variable. For this chapter, the research analysis and findings will be presented. As per prescribed in the previous chapter, the data were analyze using SPSS version 21. The results of the descriptive analysis of respondents and the mean of each variable and dimensional will be identified. Frequency analysis was performed to identify respondent's demographic profile such as age, gender, race, marital status, education level, position, occupation and duration of service. The hypothesis of this study has been identified in chapter 2 will tasted using 2-tailed Pearson correlation analysis.

4.2 Demographic Background

The survey form determines the demographic profile of the 85 respondents. Table 4.1 shows the summarized variables and frequencies for demographic information such as age, gender, race, marital status, education level, occupation, working division, working hours and work experiences.

Table 4.1: Descriptive analysis of employees based on demographic data

		Frequency	Percent %
Age	**21-30 years**	28	32.9
	31-40 years	46	54.1

Table 4.1, continued: Descriptive analysis of employees based on demographic data

		Frequency	Percent %
	41-50 years	10	11.8
	51-60 years	1	1.2
Gender	**Male**	6	7.1
	Female	79	92.9
Race	**Malay**	70	82.4
	Chinese	3	3.5
	Indian	7	8.2
	Others	5	5.9
Marital status	**Married**	58	68.2
	Single	27	31.8
Education Level	**Malaysia Certificate of Education**	2	2.4
	Diploma	24	28.2
	Bachelor Degree	40	47.1
	Master Degree/ PHD	19	22.4

Table 4.1, continued: Descriptive analysis of employees based on demographic data

		Frequency	Percent %
Working Division	**Genetic Laboratory**	40	47.1
	Pathology Laboratory	45	52.9
Occupation/ Designation	**Specialist**	11	12.9
	Medical Officer	10	11.7
	Science Officer	31	36.5
	Medical Laboratory Technologist	31	36.5
	Hospital Attendant	2	2.4
Working Hours	**More than 46 hrs. per week**	37	43.5
	41-46 hrs. per week	43	50.6
	40 hrs. or less per week	5	5.9
Work Experiences	**Less than 10 yrs.**	46	54.1
	11-20 yrs.	33	38.8
	21-30 yrs.	5	5.9
	more than 30 yrs.	1	1.2

The descriptive analysis based on Table 4.1 showed that the majority respondents between age group of 31 to 40 years old are the most likely to answer a given questions survey who has been granted a total of 54.1 %. Whereas respondents age group of 21 to 30 years old were 32.9%, group of 41-50 years old were 11.8 % and 1.2% are the most senior workers participate in this study are age group between of 51 to 60 years old. Out of the total 85 respondents, female respondent was 92.9 % while male respondent was only 7.1 % as the number of female workers was significantly higher compared to male. Besides that, analysis of the race categories showed that most of the respondents are Malays (82.4 %), followed by Indian (8.2 %), Others (5.9 %) and Chinese (3.5 %). Data analysis in terms of marital status depict that 36.8% are still single and 68.2 % has married.

The highest percentage of respondents with a majority of educational qualification had a Bachelor Degree of 47.1%, followed by a Diploma of 28.2%, Master Degree of 22.4 % and Malaysia Certificate of Education of 2.4 %. In terms of occupation designation, 37.6% respondent are Medical Laboratory Technologist, followed by Science Officer with 36.5% ,12.9 % are Pathology Specialist, 11.8% of Medical Officer and only 1.2% was Hospital Attendant.

At Pathology Department HTA, there are 2 major division running the operation which are Pathology Laboratory (PL) and Genetic Laboratory (GL). Out of total 96 employees in this department, 85 participated in these studies. From total respondents, data showed 52.9 %(N=45) were from Pathology Laboratory division and 47.1 % (N=40) represent Genetic Laboratory. In measuring total working hours per week, data showed 50.6 % respondents worked at least 41 to 46 hours per week followed by 43.5% employees work more than 46 hours per week and was only 5.9 % worked less than 40 hours per week. In

terms of service period and work experiences among employees, data indicated that 54.1 % working less than 10 years, 38.8 % were employed between 11-20 years, 5.9 % has work experienced around 21 – 30 years and only 1.2% served in government services more than 30 years.

4.3 Data Screening

4.3.1 Normality Test

A normal distribution of sample data is often defined as a symmetrical bell-shaped curve with the highest frequency in the centre, with a smaller frequency towards the extreme, according to Gravetter & Wallnau (2000). Hair et al. (2003) explain that the normal tests are performed to check whether data is distributed normally. According to Hair et al. (1998) all the data were normally distributed when values for Skewness and Kurtosis range from -1.98 to 1.98. Hair et al. (2017) explained that Skewness assesses the extent to which the distributions of variables are symmetric and Kurtosis refers to ‘peak’ of ‘pride’ distributions compared to normal distributions. After screening, the data were further examined to determine whether it was suitable for the selected statistical technique. Tabachnich & Fidell (2007) explained that the normality test is an important step in multivariate analysis, as such analysis requires normal distribution of data. Moreover, it is recommended to use both graph plot and statistical test to assess the true level of deviations for normality (Hair et al., 2010). The distribution curves for the entire dependent and independent variables are shown in figures shown below.

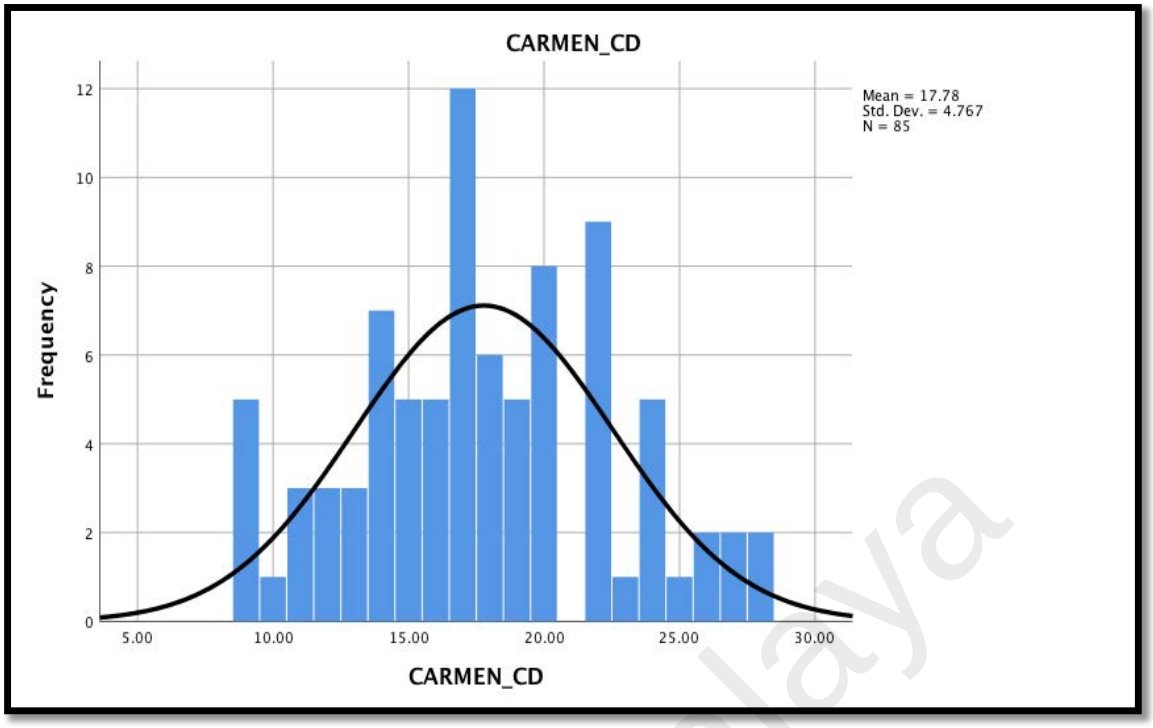


Figure 4.1: Histogram show of frequency distribution for cognitive demand among Pathology staffs at Pathology Department Hospital Tunku Azizah.

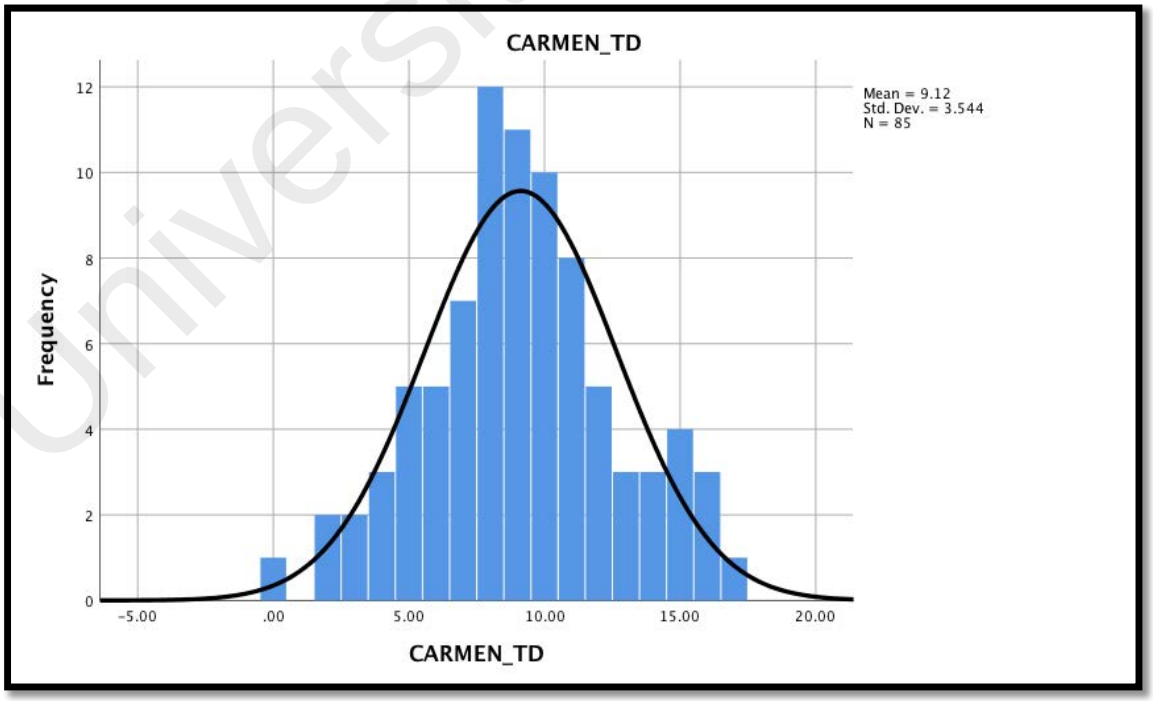


Figure 4.2: Histogram show of frequency distribution for temporal demand among Pathology staffs at Pathology Department Hospital Tunku Azizah.

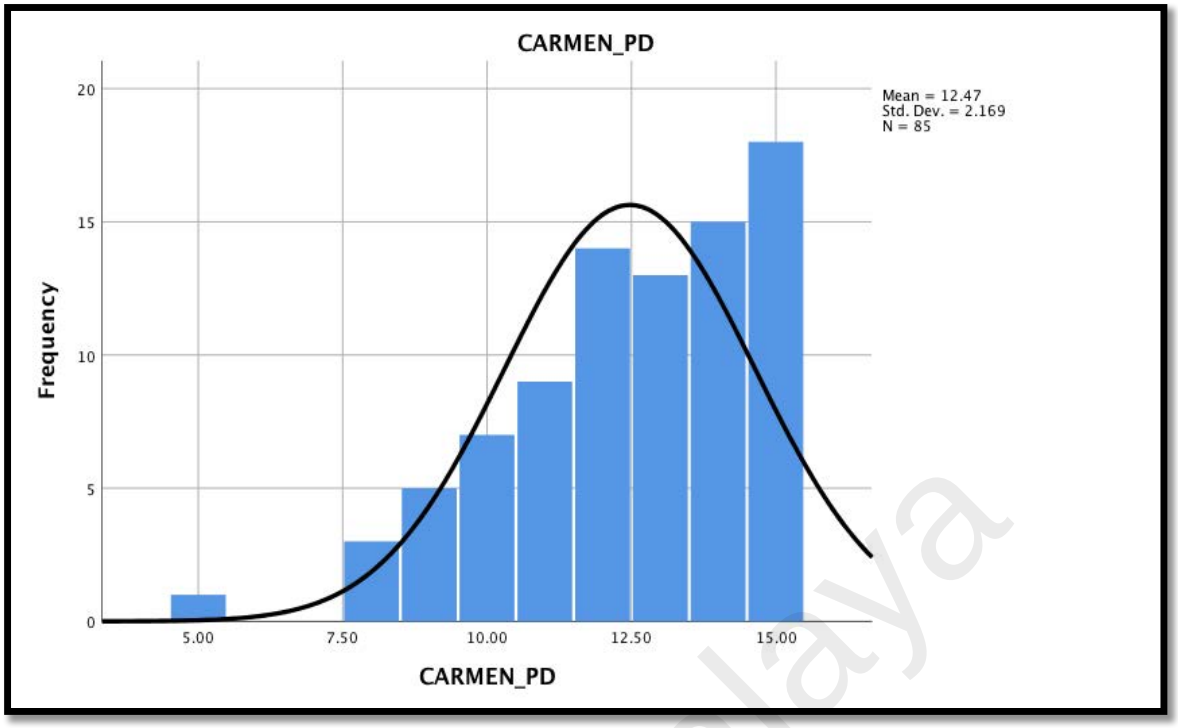


Figure 4.3: Histogram show of frequency distribution for performance demand among Pathology staffs at Pathology Department Hospital Tunku Azizah.

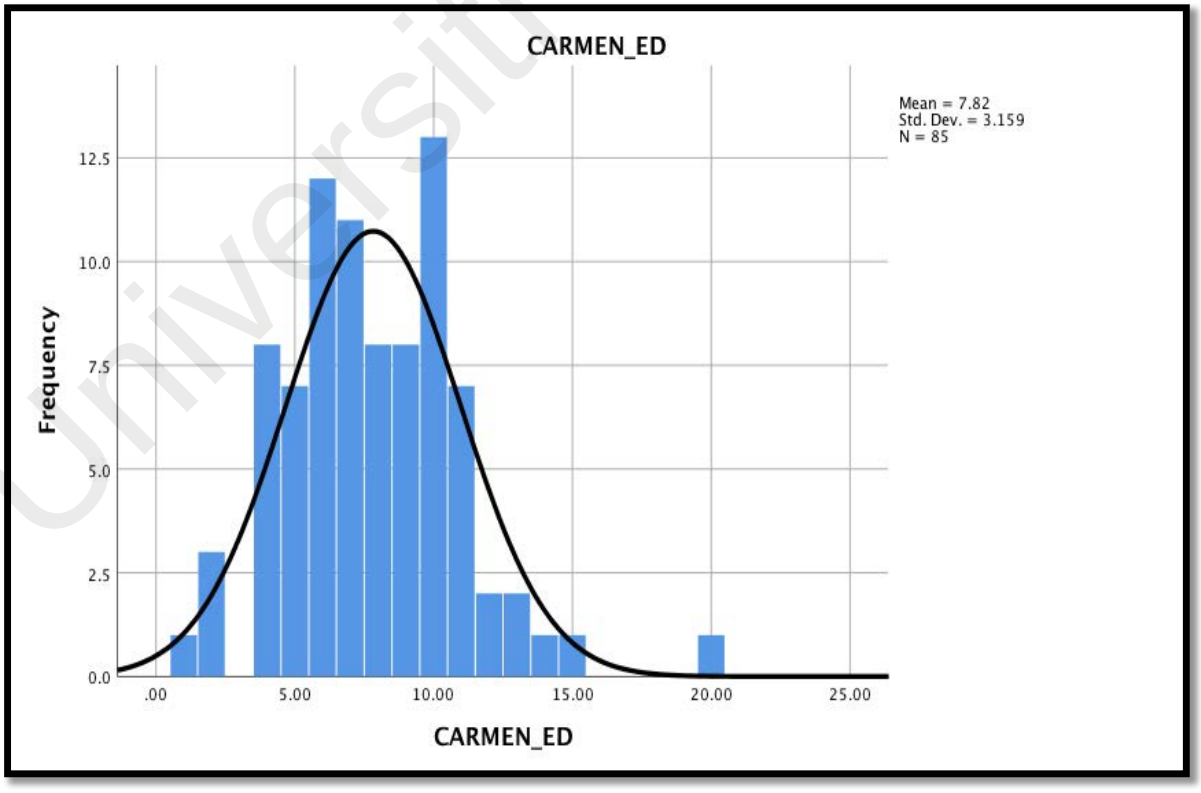


Figure 4.4: Histogram show of frequency distribution for emotional demand among Pathology staffs at Pathology Department Hospital Tunku Azizah.

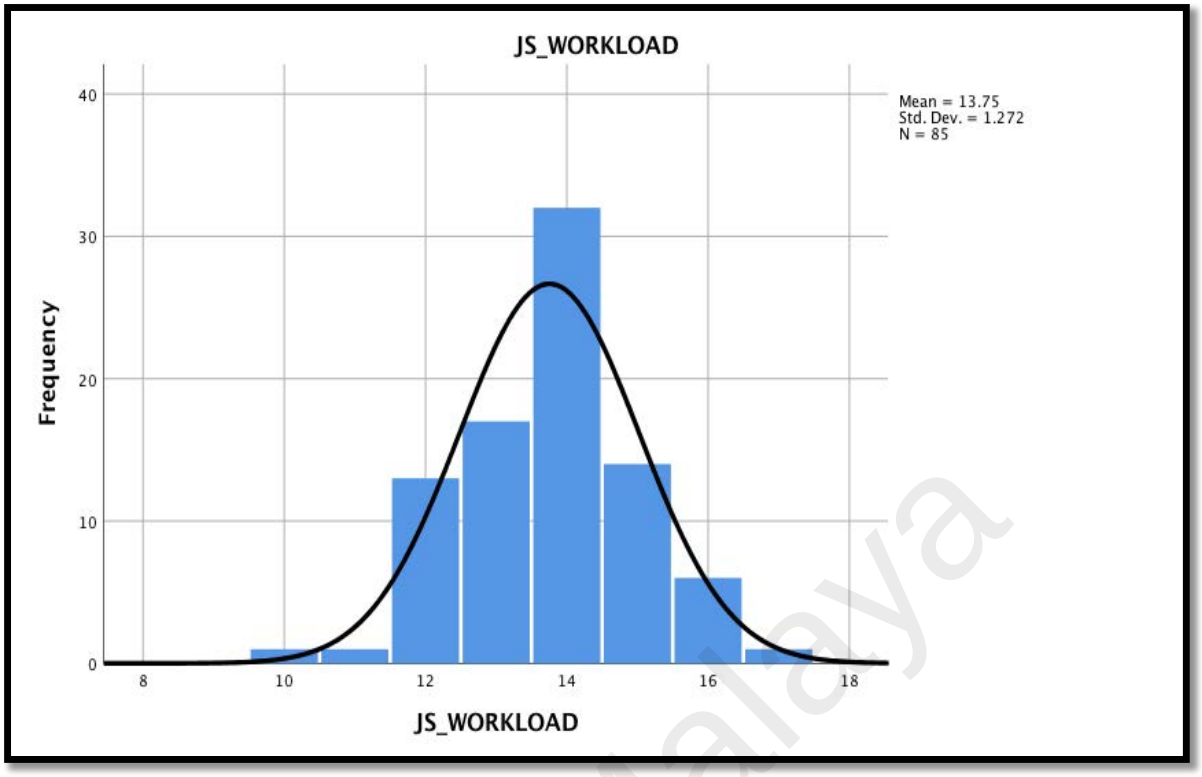


Figure 4.5: Histogram show of frequency distribution for job satisfaction among Pathology staffs at Pathology Department Hospital Tunku Azizah.

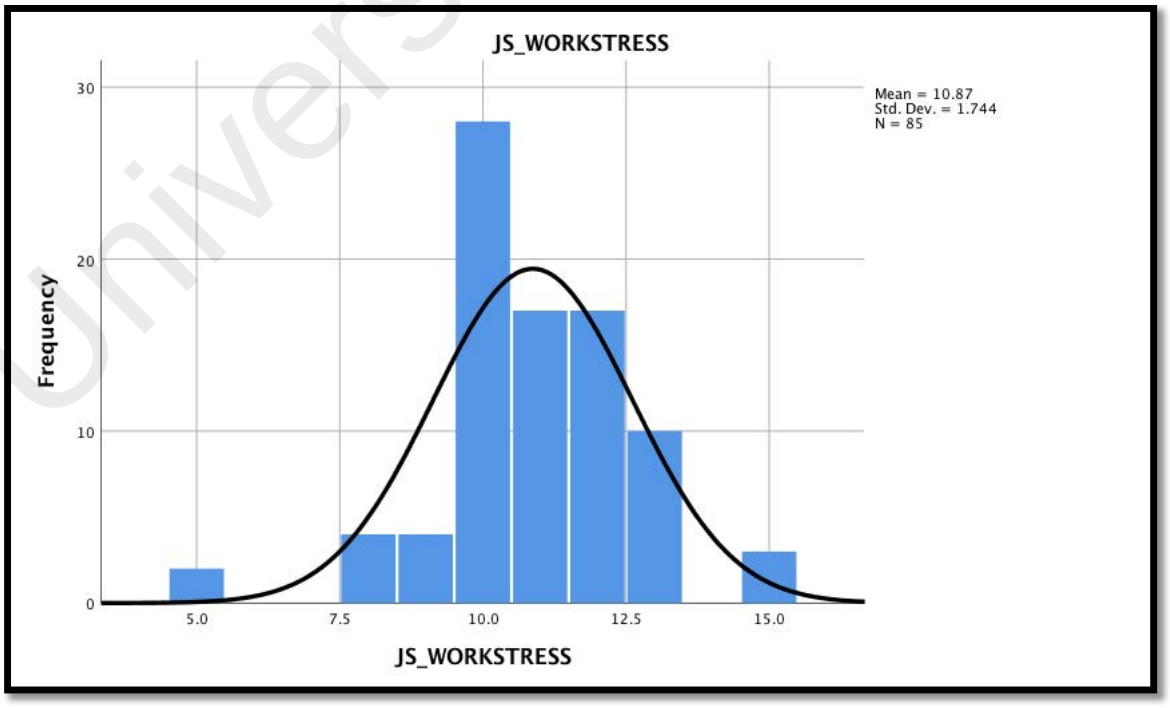


Figure 4.6: Histogram show of frequency distribution for work stress among Pathology staffs at Pathology Department Hospital Tunku Azizah.

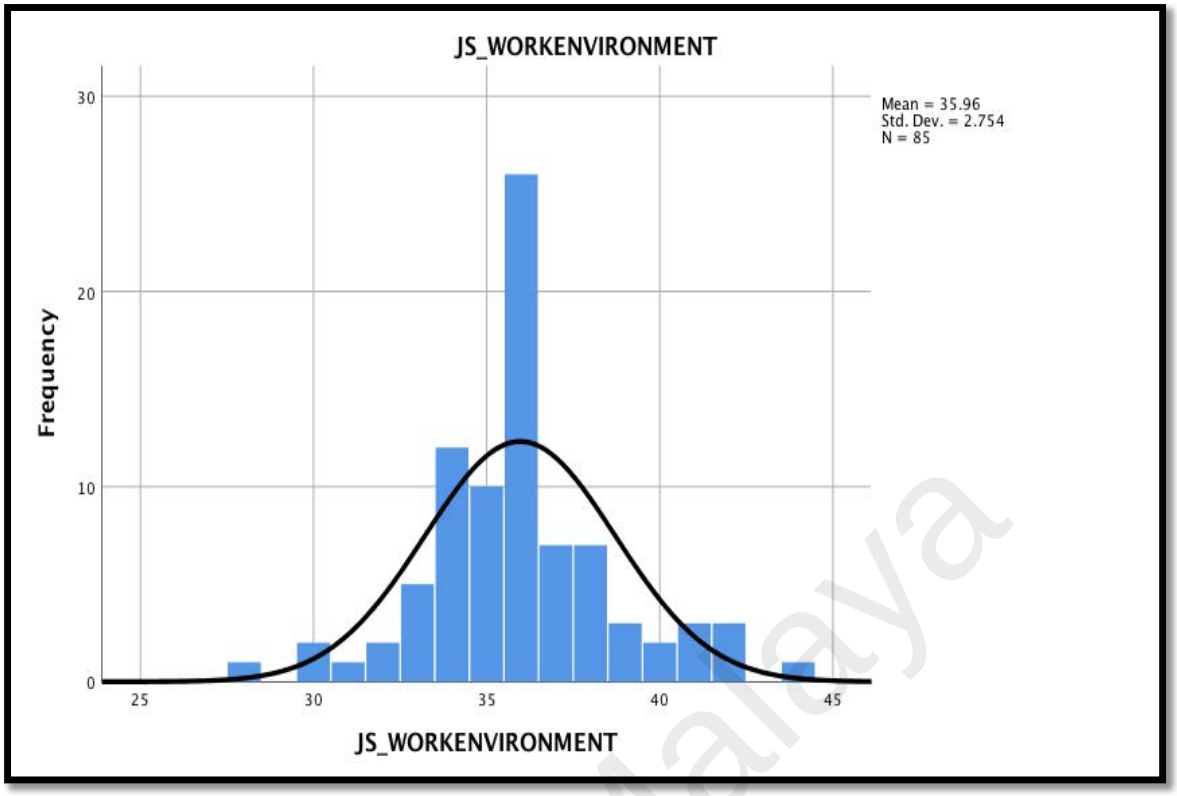


Figure 4.7: Histogram show of frequency distribution for work environment among Pathology staffs at Pathology Department Hospital Tunku Azizah.

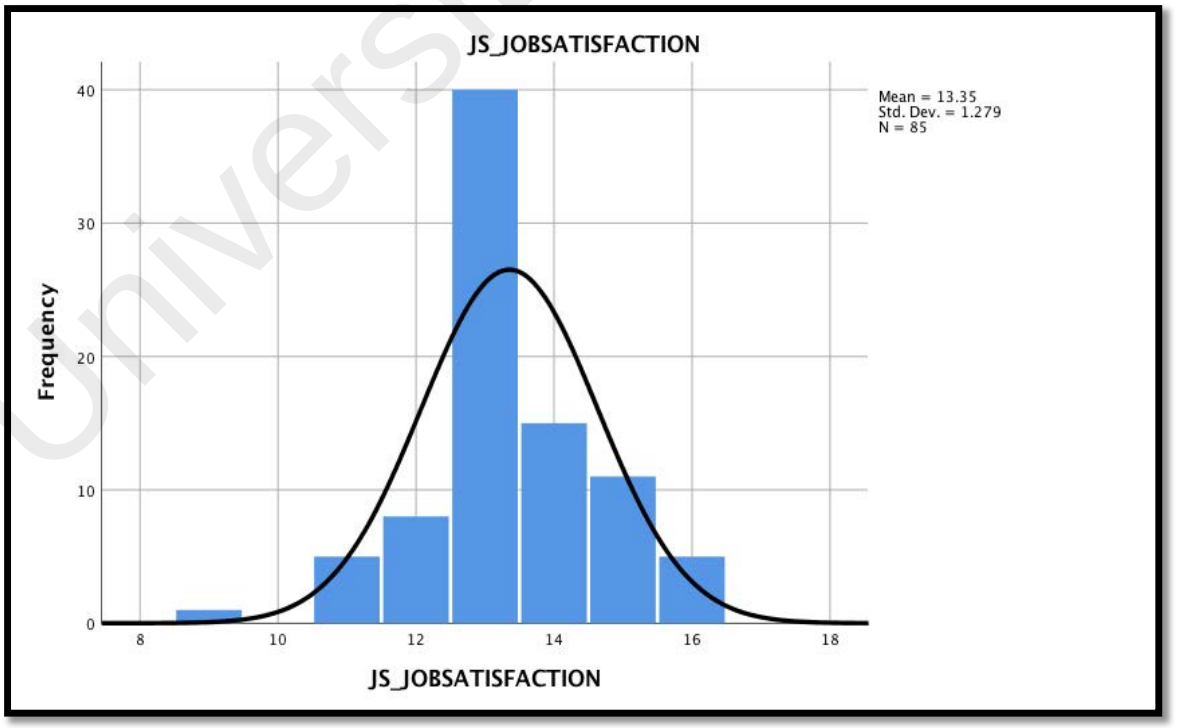


Figure 4.8: Histogram show of frequency distribution for job satisfaction among Pathology staffs at Pathology Department Hospital Tunku Azizah.

Table 4.2: Result of the Normality Test

Variable	Skewness	Kurtosis	Conclusion
Cognitive demand	0.261	-0.489	Normally Distributed
Temporal demand	0.261	-0.095	Normally Distributed
Performance demand	0.261	0.45	Normally Distributed
Emotional demand	0.261	1.6448	Normally Distributed

Table 4.3: Result of the Normality Test

Variable	Skewness	Kurtosis	Conclusion
Job Satisfaction	-0.135	1.041	Normally Distributed
Workload	-0.125	0.226	Normally Distributed
Work Stress	-0.485	1.163	Normally Distributed
Work Environment	0.255	1.165	Normally Distributed

The skewness and kurtosis values for all variables ranged from −1.98 to +1.98, according to Table 4.2 to 4.3. It can therefore be inferred that the results in this analysis fall into the normality spectrum.

4.3.2 Reliability Analysis

Reliability analysis is an important tool for measuring whether the instruments used in this study are reliable and acceptable. In this analysis, Cronbach's alpha values were used to determine the reliability of the instrument (Hair et al., 2010). Nunally (1978) declare that the acceptable alpha coefficient is greater than 0.7. Table 4.5 to Table 4.7 shows the Cronbach alpha value for independent and dependent variables.

Hence, in this research, a pilot study was conducted among Medical Laboratory Technologist (MLT) at Hospital Kuala Lumpur involving ten workers. MLT have been selected because are nature of work similar to actual respondent. The questionnaires was distribute to ten respondents and all were completed and used for this study. The time required to complete the questionnaire is between 15-20 minutes. Feedback from respondents showed that most of them can understand the clarity of words with minimal changes required. Reliability tests are measured to ensure that no bias (error-free) occurs.

Table 4.4: Summary of Pilot Test result

Variable	*: Job Satisfaction*	*Work Load*	*Work Stress*	*Working Environment*
N of Items	*: 5*	*5*	*5*	*13*
Cronbach Alpha	*:0.872*	*0.826*	*0.798*	*0.875*

Based on the table 4.4 for reliability test results, it was shown that all Cronbach alpha values for both independent and dependent variables were greater than **0.7**. It can to be concluded that all items for all variables in this study are reliable and has a good value.

Table 4.5: Reliability measure for Independent Variables Mental Workload Assessment

Variable	N of items	Coefficient Alpha
Cognitive demand	10	0.87
Temporal demand	7	0.80
Performance demand	5	0.69
Emotional demand	7	0.84

Table 4.6: Reliability measure for Dependent Variables DASS-21 (depression, anxiety and stress) Assessment

Variable	N of items	Coefficient Alpha
Depression	7	0.87
Anxiety	7	0.86
Stress	7	0.87

Table 4.7: Reliability measure for Overall Job Satisfaction Variables

Variable	N of items	Coefficient Alpha
Work Load	5	0.77
Work Stress	5	0.54
Work Environment	13	0.78
Job Satisfaction	5	0.73

The results from the analysis of Table 4.5 to Table 4.7 above showed that all Cronbach's alpha values for the current study were greater than 0.7 for both Carmen-Q and DASS2 elements, which meant that all the items in this study were reliable. According to Table 4.7, the Cronbach's alpha value for the dependent variable on the current study is 0.54 to 0.78. As the most values of more than 0.7, the item in this instrument is reliable (Nunally, 1997).

4.3.3 Linearity

Linearity is another analysis to find out the relationship between independent and dependent variables. To examine linearity, this study uses a residual distribution plot, where standard residuals are plotted against predicted values. Studies on linearity conducted by Flury and Riedwyl (1988) show that when satisfied, the balance will spread around zero, or most scores will center on the zero point.

Figures 4.9 to 4.12 shows the plot of the distribution between total mental workload (Total CarMen-Q Scores) with DASS-21 *(depression, anxiety and stress scores*) and job satisfaction variables. The plot shows that the residual score is centered on the zero point, indicating that the assumption of linearity is met. This analysis showed that the first and second hypothesis will have a significant linear relationship. Here, total mental workload seems to have linearity relationship with on the depression, stress and anxiety status among healthcare workers and job satisfaction. According to Hair et al. (2010) if a nonlinear pattern is not shown in the residual analysis, the entire equation is guaranteed linear and can be examined through residual plots. So far, all Scatterplot *(Bivar)* of all variables showed a positive linearity with all the test conducted.

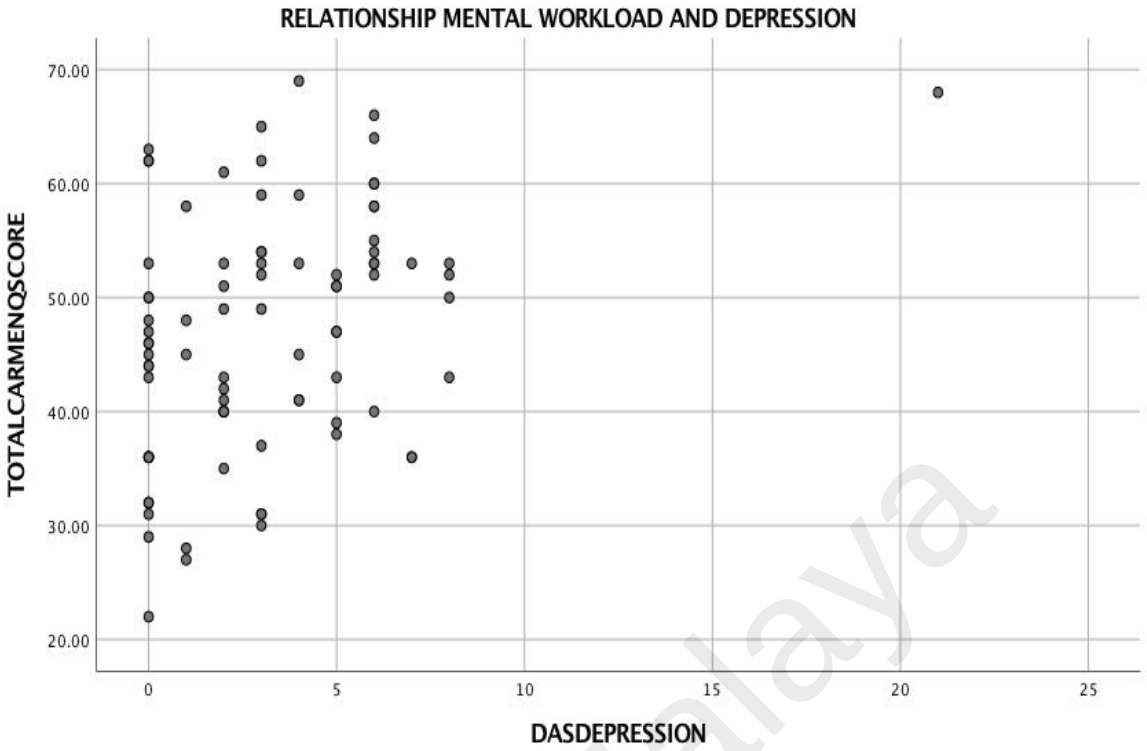


Figure 4.9: Scatterplot (Bivar) show the linearity (positive) of total Carmen-Q Score with DASS21 (depression)

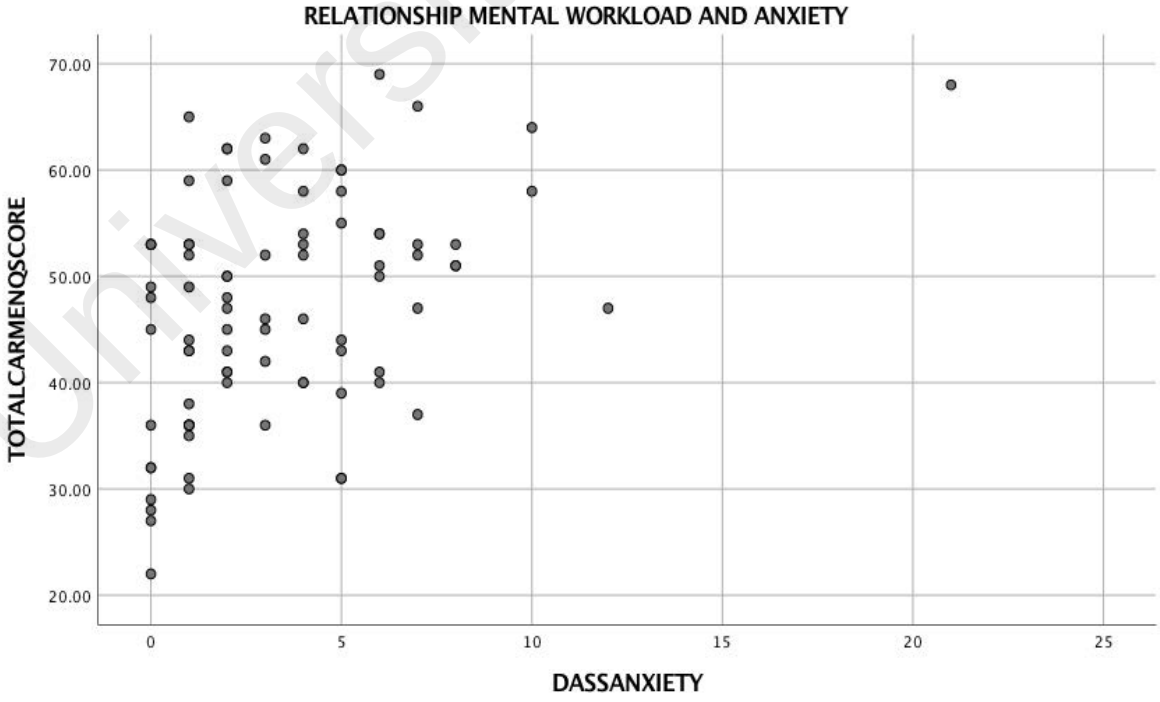


Figure 4.10: Scatterplot (Bivar) show the linearity (positive) of total Carmen-Q Score with DASS21 (anxiety)

Figure 4.11: Scatterplot (Bivar) show the linearity (positive) of total Carmen-Q Score with DASS21(stress)

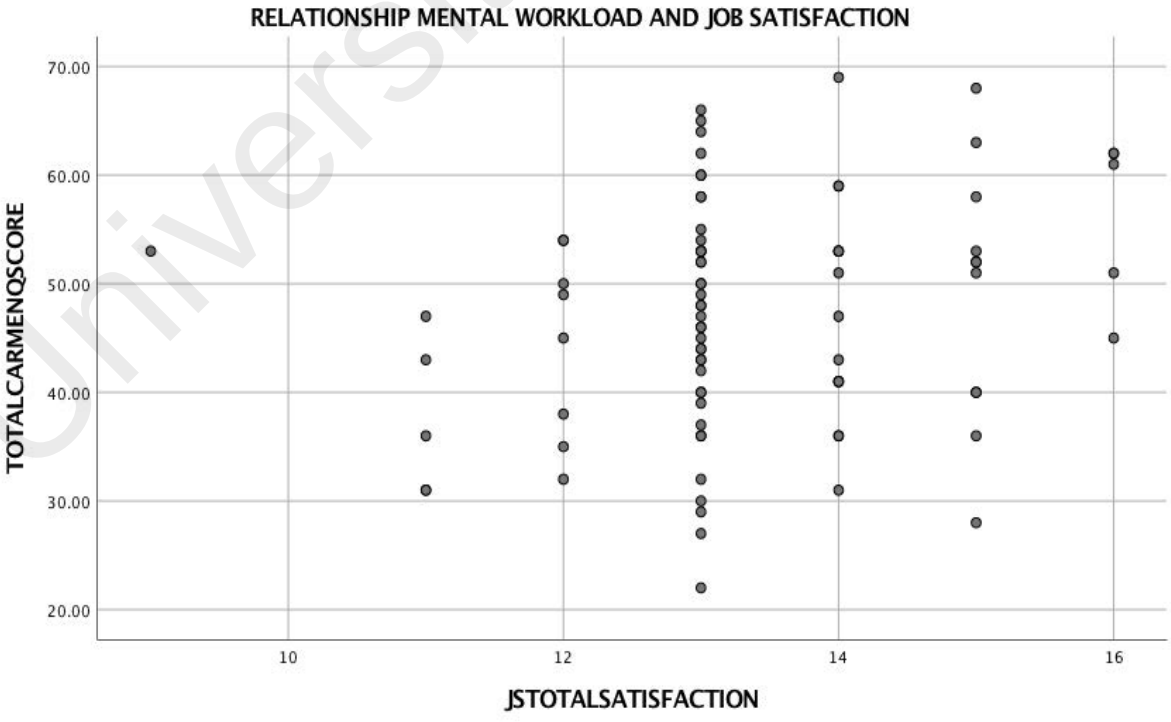


Figure 4.12: Scatterplot (Bivar) show the linearity (positive) of total Carmen-Q score with Overall Job Satisfaction

4.4 Assessment of Mental Workload Among Pathology Department Staffs Using CarMen-Q

In this section, data analysis using CarMen-Q is presented to report the result of mental workload of the study subjects. Based on Table 4.8 and Figure 4.13, the respondents were highly burdened in performance demands followed by cognitive demands, temporal demands and emotional demands. This finding shows that the employees in the selected Pathology Department feel that their performance acquires high demand by their superiors in comparison with other demand with mean percentage at 83.14% followed by cognitive demand with 52.26%, temporal demand 43.42% and lastly emotional demand at average of 37.26 %. Average mean of total mental workload is at least 54.23%.

Table 4.8: Analysis of Mental Workload

Demands	Performance	Cognitive	Temporal	Emotional	MWL
Mean	83.137	52.255	43.417	37.255	54.23
N	85	85	85	85	85
Standard Deviation	14.459	12.889	16.875	15.044	12.193

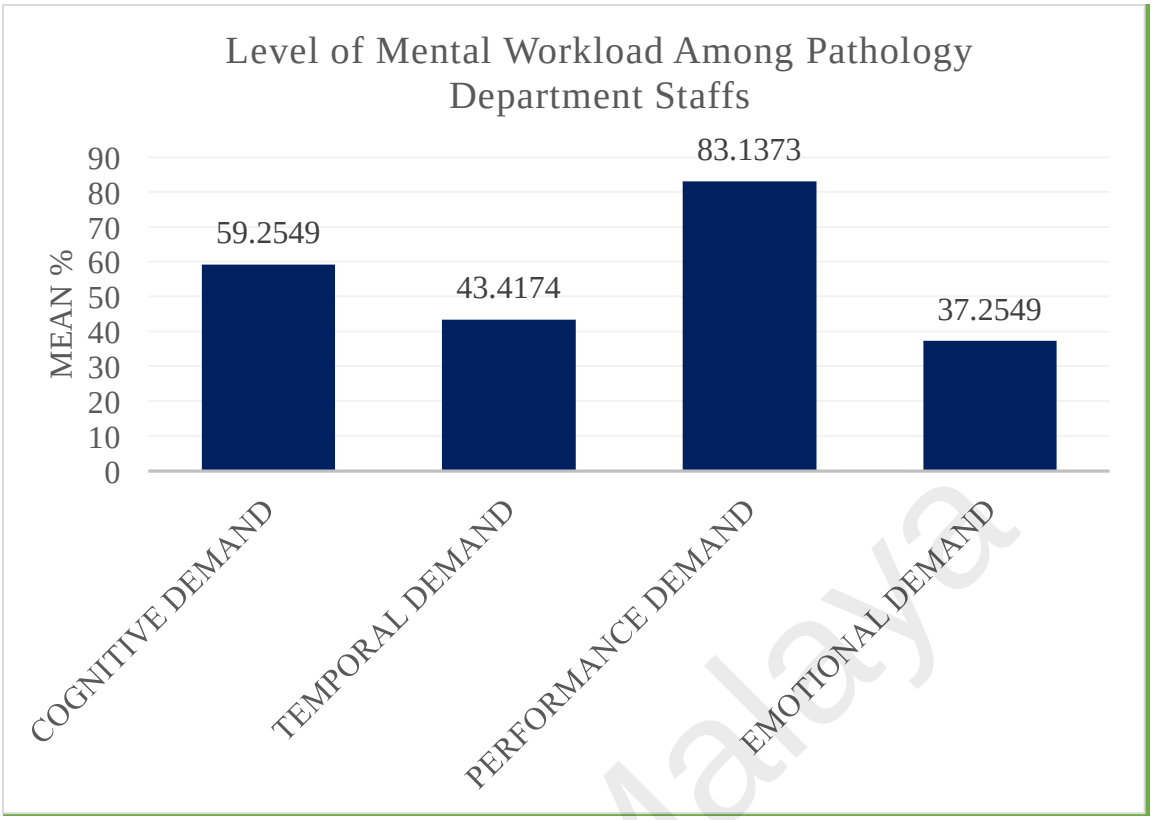
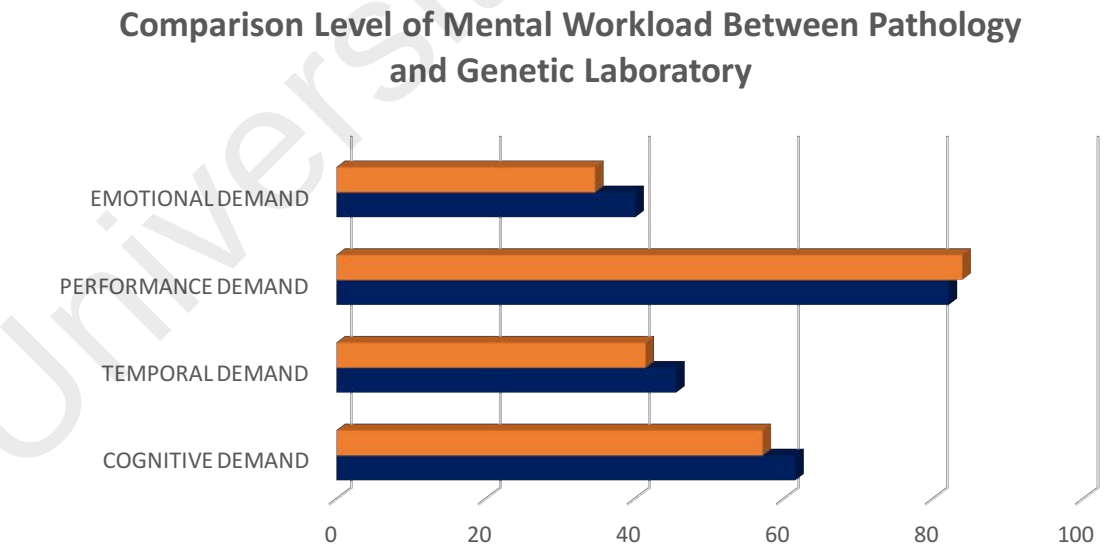


Figure 4.13: Level of mental workload of healthcare workers in Pathology Department

Table 4.9: Analysis of Mental Workload by Division at Pathology Department HTA

Working Division		Cognitive Demand	Temporal Demand	Performance Demand	Emotional Demand
Genetic Laboratory	**Mean**	61.5833	45.5952	82.1667	40.119
	N	40	40	40	40
	Std. Deviation	17.68653	17.08059	14.58935	14.09674
Pathology Laboratory	**Mean**	57.1852	41.4815	84	34.709
	N	45	45	45	45
	Std. Deviation	13.9797	16.6395	14.45299	15.55084
Total	**Mean**	59.2549	43.4174	83.1373	37.2549

Table 4.9 above showed the comparison dimension of mental workload demand by two main divisions in Pathology Department. Here, the distribution of mental workload dimension between Genetic Laboratory (GL) staffs and Pathology Laboratory (PL) staffs are about equal where the performance demands are required higher in their daily basis task with at least 82.17%(SD=14.58935) for GL and 84%(SD=14.45299) for PL. Due to complexity of lab test and diagnostic analysis, the cognitive demand from both divisions showed at range of 57.19% to 61.28% with standard deviation of 13.9797 to 17.68653. Since most of the specimen's analysis are ordered either elective, routine or urgent, the temporal demand level for GL are at least (M= 41.48, SD= 16.63) and PL are slightly higher with (M= 45.46, SD= 17.08). Finally, for an emotional demand, the mean percentage are at 34.71% to 40.12% with SD of 14.097 to 15.551 which output depict that GL demanding slightly higher compares to PL staffs. Below are the bar charts for Mental of Workload between GL and PL staffs.



	COGNITIVE DEMAND	TEMPORAL DEMAND	PERFORMANCE DEMAND	EMOTIONAL DEMAND
Pathology Laboratory Mean	57.1852	41.4815	84	34.709
Genetic Laboratory Mean	61.5833	45.5952	82.1667	40.119

Figure 4.14: Level of mental workload of healthcare workers by division in Pathology Department

Table 4.10: Analysis of Mental Workload by Occupation at Pathology Department HTA

Occupation		Cognitive Demand	Temporal Demand	Performance Demand	Emotional Demand
Specialist (SP)	**Mean**	73.0303	45.4545	92.7273	41.9913
	N	11	11	11	11
	Std. Deviation	14.48789	9.12589	8.669	11.02835
Medical Officer (MO)	**Mean**	56.6667	27.1429	73.3333	26.1905
	N	10	10	10	10
	Std. Deviation	18.12167	20.5799	21.77324	19.34295
Science Officer (SO)	**Mean**	61.9355	46.6974	81.5054	36.5591
	N	31	31	31	31
	Std. Deviation	15.81781	16.92183	13.73934	12.74122

Table 4.10, continued: Analysis of Mental Workload by Occupation at Pathology Department HTA

Occupation		Cognitive Demand	Temporal Demand	Performance Demand	Emotional Demand
Medical Laboratory Technologist (MLT)	**Mean**	53.0208	44.9405	84.7917	39.5833
	N	32	32	32	32
	Std. Deviation	12.62527	15.53369	12.2383	15.92892
Hospital Attendant (PPK)	**Mean**	50	33.3333	73.3333	42.8571
	N	1	1	1	1

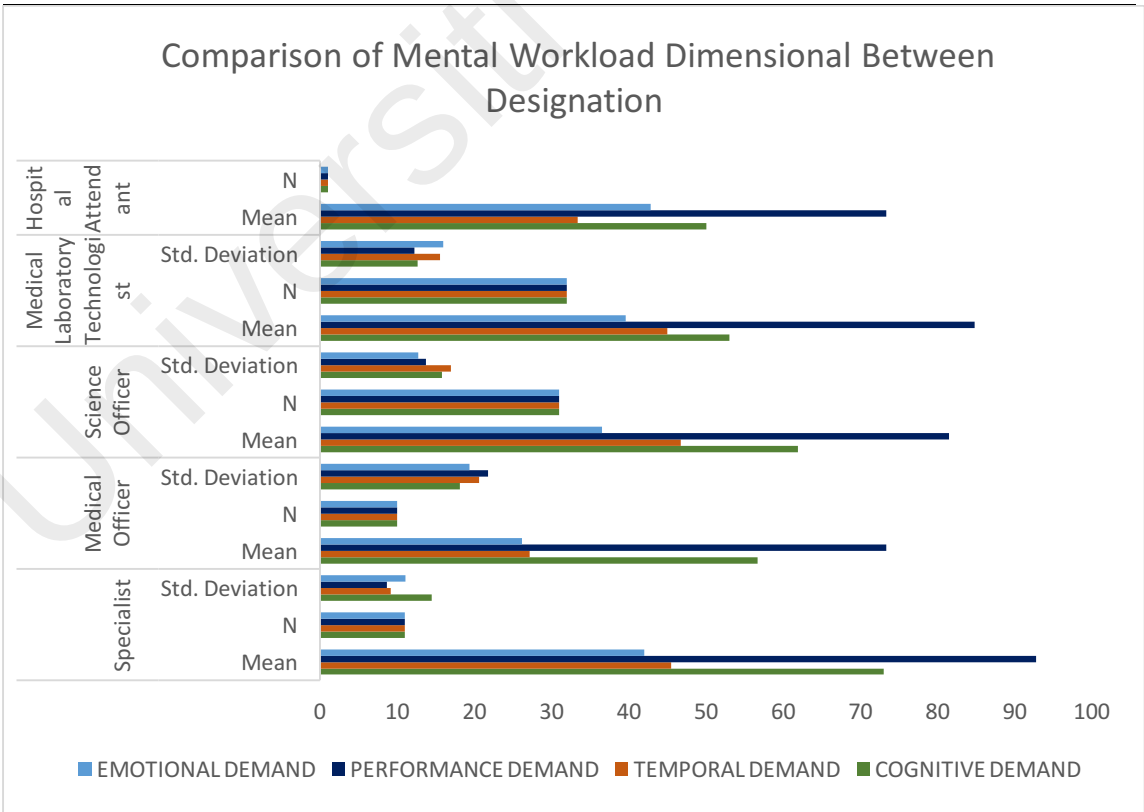


Figure 4.15: Level of mental workload of healthcare workers by occupation in Pathology Department

Table 4.10 and Figure 4.15 above showed the level on mental workload demand between profession at Pathology Department. Since both division consist of equal different profession groups in their team even though the sub-discipline and task is slightly varying. Here we will compare the level of mental workload dimensional among this profession groups. Data disclosed that highest level of performance demand lead by specialist group with (M= 92.73, SD= 8.669), followed by MLT's with (M= 84.79, SD= 12.24), SO's with (M=81.5054, SD= 13.74) where MO's with (M=73.33, SD= 21.77). For the lowest grade staffs in this department, her mean percentage for PD are at 73.33. Here for cognitive demand dimensional, analysist output shows Specialist group demanded higher with (M= 73.03, SD= 14.48) followed by SO's (M= 61.94, SD= 15.82). These two group of professions required higher cognitive demand due to their responsibilities to performed more complex test and required to supervised the results generated by MO's and MLTs. For MO's their cognitive demand are at (M=56.67, SD= 18.12) and MLT are (M=53.02, SD= 12.63). Moves to temporal demand, SO required higher demands with (M= 46.67, SD= 16.92) followed by SP with (M= 45.45, SD= 9.12), MLT with (M= 44.94, SD= 15.53), PPK with mean percentage of 33.33 and MO's with (M= 27.14, SD= 20.58). Lastly for emotional demand between all these professions showed PPK had higher demand with Mean percentage of 42.87 followed by SP with values of (M=44.99, SD= 11.02), SO (M= 36.56, SD= 12.74), MLT (M= 39.58, SD= 15.93) and lastly MO (M= 26.19, SD= 19.34). These differences values and spectrum will be discussing further in chapter 5.0.

Table 4.11: Level of mental workload of healthcare workload by working hours in Pathology Department

Occupation		Cognitive Demand	Temporal Demand	Performance Demand	Emotional Demand
More Than 46 Hours Per Week	**Mean**	59.4595	44.9163	87.027	37.0656
	N	37	37	37	37
	Std. Deviation	15.56574	16.16948	12.56548	16.11463
	% of Total N	43.50%	43.50%	43.50%	43.50%
41 to 46 Hours Per Week	**Mean**	60.6202	41.8605	80.7752	36.3234
	N	43	43	43	43
	Std. Deviation	15.62212	16.93366	15.81703	14.7697
	% of Total N	50.60%	50.60%	50.60%	50.60%
40 Hours or Less Per Week	**Mean**	46	45.7143	74.6667	46.6667
	N	5	5	5	5
	Std. Deviation	17.85746	23.71409	7.30297	2.12959
	% of Total N	5.90%	5.90%	5.90%	5.90%
Total N		85	85	85	85

In this Table 4.11, researcher want to compare the mental workload demands between three groups of workers who dedicated their worked more than 46 hours per week, 41 to 46 hours per weeks and less than 40 hours. Most of the staffs in this department had to work overtime, on-call basis and shift. Here we will evaluate the level of mental workload between this three groups. For group of staffs who's worked more than 46 hours per week, their cognitive demand is (M= 59.26, SD= 15.57), temporal demand (M= 44.92, SD= 16.17), performance demand (M= 87.03, SD= 12.56), emotional demand (M= 37.07, SD= 16.11). For group of staffs who work within 41 to 46 hours per week, their cognitive demand is (M= 60.62, SD= 15.62), temporal demand (M= 41.86 SD= 16.93), performance demand (M= 80.77, SD= 12.56), emotional demand (M= 36.32, SD= 14.77). Lastly, for group of workers who work less than 40 hours per weeks, the cognitive demand showed around (M= 46, SD= 17.86), temporal demand (M= 45.71 SD= 23.71), performance demand (M= 74.67, SD= 7.303), emotional demand (M= 46.667, SD= 2.129). As conclusion, in average healthcare workers who worked more than 46 hours required higher mental workload demand compares to other groups.

4.5 Data Analysis for DASS-21 (Depression, Anxiety & Stress)

Table 4.12: Mental health status (DASS-21) among healthcare workers Pathology Department HTA.

DASS 21	Stress		Anxiety		Depression	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Normal	78	91.8	57	67.1	65	76.5
Low	5	5.9	16	18.8	15	17.6
Moderate	1	1.2	8	9.4	4	4.7
Severe	0	0	2	2.4	0	0
Very Severe	1	1.2	2	2.4	1	1.2
Total	**85**	**100**	**85**	**100**	**85**	**100**

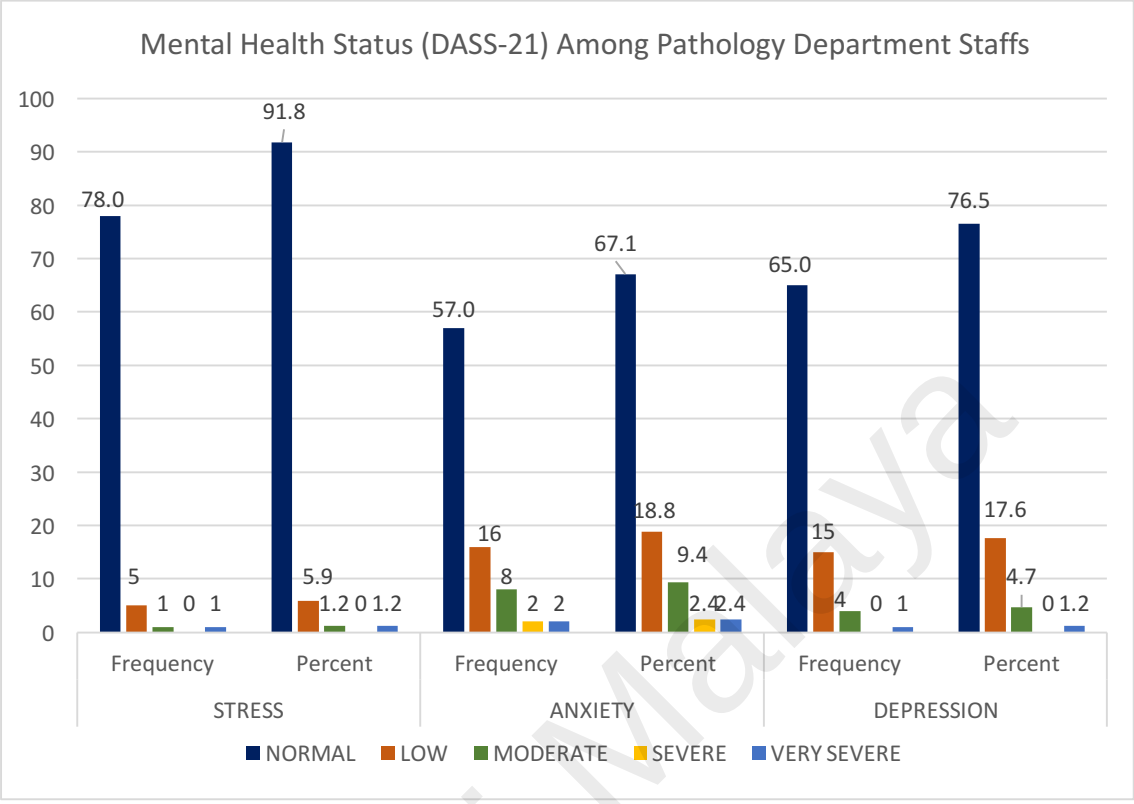


Figure 4.16: Level of mental health status among healthcare workers in Pathology Department

Based on Table 4.12 and Figure 4.16 above, most 78 (91.8 %) of employees were determined to have normal score of stress. Similarly, majority of 57 (67.1%) of the study subjects has normal score of anxiety and 65 (76.5%) has normal score of depression. The data in Table 4.12 revealed only one or (1.2%) staffs had very severe stress level and two workers were found to be severe depression. Thus, assessment also found two workers has developed very severe anxiety while assessment conducted during pandemic COVID-19. Although the data shows major portion falls under normal score of depression, anxiety and stress, the cumulative number of at least having symptoms of depression and anxiety are considered remarkable which is depicted in Table 4.13.

Table 4.13: Cumulative data of normal score and at least having symptoms of mental health among healthcare workers Pathology Department HTA.

Symptoms	Stress		Anxiety		Depression	
Subscale	**Total**	**(%)**	**Total**	**(%)**	**Total**	**(%)**
Normal	78	91.8	57	67.1	65	76.5
Having symptoms	7	8.2	28	32.9	20	23.5

Based on Table 4.13 above, researcher can conclude that more the 57 respondents were found to have normal scores of DASS-21. If we take symptoms from low to very severe symptoms, data showed seven staffs start having symptoms of stress, twenty- eight staffs had anxiousness during this pandemic period and twenty staffs from this department developed symptoms of low to moderate depression. Therefore, this finding should be highlighted to the management level as early marker to promote healthy mental health among staffs.

Table 4.14: Mental health status (DASS-21) by age group among healthcare workers Pathology Department HTA.

Age		Stress	Anxiety	Depression
21-30 years	**Mean**	1.29	1.82	1.43
	N	28	28	28
	Std. Deviation	0.854	1.249	0.959
	% of Total N	32.90%	32.90%	32.90%
31-40 years	**Mean**	1.07	1.46	1.3
	N	46	46	46
	Std. Deviation	0.25	0.721	0.511
	% of Total N	54.10%	54.10%	54.10%

Table 4.14, continued: Mental health status (DASS-21) by age group among healthcare workers Pathology Department HTA.

41-50 years	**Mean**	1	1.2	1.1
	N	10	10	10
	Std. Deviation	0	0.632	0.316
	% of Total N	11.80%	11.80%	11.80%
51-60 years	**Mean**	1	1	1
	N	1	1	1
	Std. Deviation	.	.	.
	% of Total N	1.20%	1.20%	1.20%
Total	**N**	85	85	85

Data comparison was also run by comparing level of depression, anxiety and stress with age group of employees. Workers within ages group of 21 to 31 years' old who have participated in the research were found to be more anxious, stressed and depress with statistical confirmation shown in Table 4.14 compares to other age groups. Meanwhile, in Table 4.14 employees belong to 31 to 40 years old group has (M= 1.07, SD= 0.25) stressed, (M= 1.46, SD= 0.721) anxious while working during pandemic and at least (M= 1.07, SD= 0.25) had depressive symptoms. Study also revealed that employees who are between the age of 41-50 years old and 51-60 years old are less anxious, depressed and stressed working in this department during pandemic season than the rest of the age groups.

4.6 Job Satisfaction Analysis

4.6.1 Descriptive Analysis of Independent Variable

For this analysis, job satisfaction is the dependent variables that consist of satisfaction with their workload, work stress, working environment and general job satisfaction. Therefore, researchers are keen to evaluate the level of all job satisfaction variables in order to determine their level among the personnel of the Pathology Department. The Linkert scale was used in this analysis to calculate the independent variable and the dependent variable. In independent variables ranging from 1 to 4, the 4-point Linkert scale was used (1: "strongly disagree", 2: "disagree", 3: "agree", 4: "strongly agree"). “Neutral” is not used because it is to avoid respondents to answer “uncertain”. Davis (1977) explained that variables were considered **low** when scores were **1.00 – 2.33**, **moderate** when scores were **2.34 – 3.67** and **high** when score were **>3.68**. Here is the result of the overall job satisfaction as per Table 4.15 below:

Table 4.15: Mean and standard deviation for overall job satisfaction variables

Variables		Workload	Work Stress	Working Environment	Job Satisfaction
N	**Valid**	85	85	85	85
	Missing	0	0	0	0
Mean		**2.6047**	**2.1718**	**2.7665**	**2.2635**
Std. Deviation		0.15729	0.28644	0.21181	0.21205

Based on Table 4.15 above, total average mean and standard deviation for all workload items is 2.6047 and 0.15729 respectively. This value falls in the category moderate level. Thus, it can be concluded that the respondents in Pathology Department Hospital Tunku

Azizah have a moderate satisfaction on their workload. The total average mean and standard deviations for all work stress items are 2.171 and 0.2864 respectively. This value of mean falls under the low level category. Therefore, it can be concluded that respondents have a low level of satisfaction on work stress. Whilst, the total average mean and standard deviations for all working environment items are 2.7665 and standard deviations is 0.2118. The value of mean falls under the moderate level category which means that the respondents have a moderate satisfaction level towards their working environment. Finally, for general job satisfaction, the mean value is 2.2635 and standard deviation of 0.2121. Therefore, data shows the level of general job satisfaction among workers are at low and this finding will be discuss further in chapter 5.0 to identify the possible causes of this outcome.

4.6.2 Mean & Standard Deviation of Dependent Variable

The dependent variable also had a 4 Point Likert scale ranging 1 to 4 only (1: “strongly disagree”, 2: “disagree”, 3: “agree” and 4: “strongly agree”). “Neutral” is not used because to avoid the respondents to answer “uncertain”. The analysis of this scale indicates that higher scores mean the respondents have higher job satisfaction and are more likely to love this workplace, while the lower score indicates that the respondents have lover job satisfaction and feel less motivated to work.

Davis (1971) has stated that, the most dominant variable is the closer the mean to 5 and the lowest is the closest the mean value to 1. The variables were considered low when the scores ware 1.00 – 2.33, moderate when the score was 2.34 – 3.57 and high when the score was >3.68, Davis (1977). Total average mean and standard deviations are 2.1718 to 2.6047 and 0.1573 to 0.2864 respectively. This value of mean falls under the category of low and moderate level. The conclusion for overall job satisfaction variables is at a

low to moderate level. Therefore, an action must be initiated in managing this low satisfaction, and to improve the job satisfaction among Pathology Department staffs.

4.7 Correlation Analysis

Sekaran (2003) has stated that correlation analysis is used to measure linear relationship between independent variables (workload, work stress and working environment) and dependent variables (job satisfaction). Tabachnick and Fidell (2007) have described a statistical phenomenon where two or more predictor variables in multiple regression models are highly correlated. According to Sarwono (2006) states that the strength of the correlation relationship is as follows 0: no correlation, 0.00 – 0.25: correlation is very weak, 0.25 – 0.50: reasonable / moderate correlation, 0.50 – 0.75: strong correlation, 0.75 – 0.99: very strong correlation, 1: perfect correlation. The result of the Pearson correlation analysis shown in table 4.16 and shows the correlation values and the significance of the dependent and independent variables.

Table 4.16: Correlation coefficient

Value of r	Pearson correlation
0	**No correlation**
0.00 – 0.25	**Correlation is very weak**
0.25 – 0.50	**Reasonable/ moderate correlation**
0.50 – 0.75	**Strong correlation**
0.75 – 0.99	**Very strong correlation**

Table 4.17: Pearson Correlation Analysis between Mental Workload (CarMen-Q) with DASS-21 (*depression, anxiety and stress*) among Pathology Department staffs.

Pearson's Correlations					
Variable		**Stress**	**Anxiety**	**Depression**	**Total Dass-21**
Temporal Demand	**Pearson Correlation**	**.323****	**.318****	**.313****	**.349****
	Sig. (2-tailed)	0.003	0.003	0.004	0.001
	N	85	85	85	85
Performance Demand	**Pearson Correlation**	**.307****	**.298****	0.203	**.296****
	Sig. (2-tailed)	0.004	0.006	0.063	0.006
	N	85	85	85	85
Emotional Demand	**Pearson Correlation**	**.547****	**.522****	**.563****	**.598****
	Sig. (2-tailed)	0	0	0	0
	N	85	85	85	85
Cognitive Demand	**Pearson Correlation**	**.217***	0.205	0.118	0.198
	Sig. (2-tailed)	0.046	0.06	0.28	0.069
	N	85	85	85	85
Total Mental Workload	**Pearson Correlation**	**.431****	**.415****	**.367****	**.444****

The table 4.17 was an exercise to determine the relationship between total mental workload and mental workload dimensional on mental health status (*stress, anxiety and depression*) among Pathology Department staffs during Pandemic COVID-19. Here we can see there is moderate to strong significant 2-tailed Pearson Correlation between dimensional of mental workload with DASS-21 elements. The finding showed, temporal

demand had significant moderate correlation on stress with r value = 0.323**, anxiety (r value = 0.318**) and depression with r value = 0.313** as per values above. In addition, performance demand also showed significant moderate correlation with stress at least r= 0.307** and anxiety with r= 0.298**. Somehow, emotional demand showed very strong correlation with all mental health variables with r= 0.522** to 0.563**. Researcher also conducted correlation study between total mental workload on all DASS-21 variables. Here the result showed the Pearson Correlation are significant in range of reasonable or moderates with r values on stress are 0.431**, anxiety (r= 0.415**) and depression with r= 0.365**. Therefore, data showed most of mental health variables have significant reasonable positive correlation with mental workload dimensional of Pathology Department staffs during pandemic COVID-19.

Table 4.18: Pearson correlation analysis between Mental Workload (CarMen-Q) with Job Satisfaction (workload, work stress, work environment and general job satisfaction) among Pathology Department staffs.

Pearson's Correlations					
Variable		**Workload**	**Work Stress**	**Work Environment**	**Job satisfaction**
Temporal Demand	**Pearson Correlation**	**.294****	**.311****	0.015	-0.086
	Sig. (2-tailed)	0.006	0.004	0.891	0.433
	N	85	85	85	85
Performance Demand	**Pearson Correlation**	0.049	0.052	**.266***	0.131
	Sig. (2-tailed)	0.654	0.635	0.014	0.232
	N	85	85	85	85

Table 4.18, continued: Pearson correlation analysis between Mental Workload (CarMen-Q) with Job Satisfaction (workload, work stress, work environment and general job satisfaction) among Pathology Department staffs.

Variable		Workload	Work Stress	Work Environment	Job satisfaction
Emotional Demand	**Pearson Correlation**	0.011	**.234***	-0.124	-0.107
	Sig. (2-tailed)	0.918	0.031	0.259	0.328
	N	85	85	85	85
Cognitive Demand	**Pearson Correlation**	0.071	0.205	0.173	0.165
	Sig. (2-tailed)	0.517	0.06	0.114	0.131
	N	85	85	85	85
Total Mental Workload	**Pearson Correlation**	0.144	**.276***	0.1	0.04

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

The experimental results in Table 4.18 shows that relationship between total mental workload with work stress satisfaction had reasonable correlation with at least r= 0.276* and with temporal demand variables (r= 0.311**) and emotional demand (r= 0.234*). In the other hand, results also showed moderate correlation between temporal demand with workload satisfaction with at least r= 0.294**. Study also found that there are significant moderate or reasonable correlation between emotional demand with working environment with r= 0.234*. Here we can conclude from the Table 4.18 above, there are partial relationship between mental workload on job satisfaction variables among healthcare workers during this pandemic COVID-19.

Table 4.19: Pearson correlation analysis between DASS-21(depression, anxiety and stress) with Job Satisfaction (workload, work stress, work environment and job satisfaction) among Pathology Department staffs.

Pearson's Correlations					
Variable		**Workload**	**Work Stress**	**Work Environment**	**Job satisfaction**
Depression	**Pearson Correlation**	0.008	0.145	-0.198	-0.209
	Sig. (2-tailed)	0.941	0.185	0.069	0.055
	N	85	85	85	85
Anxiety	**Pearson Correlation**	0.08	**.254***	-0.034	-0.128
	Sig. (2-tailed)	0.468	0.019	0.756	0.244
	N	85	85	85	85
Stress	**Pearson Correlation**	-0.093	**.275***	-0.054	-0.074
	Sig. (2-tailed)	0.397	0.011	0.624	0.501
	N	85	85	85	85
Total DASS	**Pearson Correlation**	0.082	**.331****	0.002	-0.066
	Sig. (2-tailed)	0.456	0.002	0.983	0.546
	N	85	85	85	85

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Here, researcher wanted to find out, was there any correlation between mental health status dimensional on job satisfaction variables. Here the results showed from Table 4.19 that total DASS-21 have moderate or reasonable significant correlation on work stress satisfaction with at least r= 0.331** compares to the other variables. Apparently only two mental health variables have significant moderate correlation with work stress

satisfaction which is anxiety and stress with at least r= 0.254* and 0.275*. Other dimension doesn't show any reasonable significant correlation as per table 4.19.

Table 4.20: Pearson correlation analysis between job satisfaction variables

Pearson's Correlations					
Overall Job Satisfaction		**Workload**	**Job Stress**	**Work Environment**	**Job Satisfaction**
Workload	**Pearson Correlation**	1	**.236***	0.154	0.048
	Sig. (2-Tailed)		0.03	0.159	0.662
Job Stress	**Pearson Correlation**	**.236***	1	-0.034	0.202
	Sig. (2-Tailed)	0.03		0.754	0.063
Work Environment	**Pearson Correlation**	0.154	-0.034	1	**.350****
	Sig. (2-Tailed)	0.159	0.754		0.001
	N	85	85	85	85

* Correlation is significant at the 0.05 level (2tailed).
** Correlation is significant at the 0.01 level (2tailed).

Table 4.20 showed that there is significant positive correlation between job satisfaction and work environment satisfaction with r value of .350**. Thus, workload satisfaction showed significant reasonable correlation with job stress variable with r value of 0.236*.

4.8 Summary of The Findings

Table 4.21: Summarized the finding of this research

	Hypothesis	Conclusion
Hi	There is a linear relationship between high level mental workload on mental health status	Supported
Ho	There is no linear relationship between high level mental workload on mental health status	Not Supported
Hi	There is a linear relationship between high level mental workload on level of job satisfaction	Partially supported
Ho	There is no linear relationship between high level mental workload on level of job satisfaction status	Not supported

Based on the results, the research objective has been achieved through the testing of hypotheses. It was found that workload has significant relationship towards mental health status and level of job satisfaction among healthcare workers in Pathology Department HTA during this pandemic COVID-19. In the next chapter, the researcher will discuss the conclusion and presents several suggestions based on this study's findings.

CHAPTER 5: DISCUSSION

5.1 Introduction

The researcher addresses the three goals of the analysis in the final portion of this report, as illustrated in chapter one, and interprets the findings. The researcher also compares the findings from this study with the literature from previous studies. This study also provided the conclusion and recommendations to the respective managerial level to address issues of mental workload, mental health status, and job satisfaction among healthcare workers at Pathology Department Hospital Tunku Azizah. In this study's context, the researcher also compares the findings of previous literature with this study's results. Finally, the researcher also discusses the implications, research findings, and significant recommendations for control measures and suggestions in managing the arising issues.

5.1.1 The Importance of the Study

On the basis of the results of the previous chapter, three aims of this analysis have been achieved which are, (i) to determine level of mental workload among healthcare workers during the COVID-19 pandemic in the HTA Pathology Department, (ii) to evaluate the mental health status among healthcare workers during the COVID-19 pandemic in the Pathology Department, thirdly to identify the relationship between high mental workload on mental health status and job satisfaction and last but not least to investigate whether work stress and work environment have any significant effects towards job satisfaction. The independent variables, which are mental workload, has been found to have a substantial relationship between mental health status and job satisfaction status. Here, we will discuss the research finding academically to identify the significant relevant control measures to improve this hospital's safety and healthy working culture.

5.2 Significant Demographic Finding.

Referring to data analysis in chapter 4, out of 95 workers in this department, 85 respondents participated in this study. Out of 85 subjects, 92.9% (N=79) are female workers from various medical professions, and only 7.1% (N=6) were male. In certain nations, women make up more than 75% of the workforce in the health sector, based on WHO gender and health workforce figures (2008), rendering them invaluable as contributors to the delivery of health care services. Discussing marital status among subjects, data found that 68.2% are married, and only 31.8% of subjects remaining single. Malaysia is a multicultural and multi-races country to view the spectrum of races in this department. Data identified 70 subjects are Malays, followed by 7 subjects are Indians, 5 other races and only 3 subjects are Chinese. We can relate that Malay workers are the majority in this department. The highest race population in Malaysia is Malays and native, with at least 70% of total populations compared to other races, Department of Statistics Malaysia (2020). Looking at the education level and age group among subjects, demographic data showed, more than half of employees are university graduates in medical and science courses. Here, a minimum requirement to work as a laboratory technologist in this are diploma certificate. We can have assumed that this department is operating with well-educated and trained staff by 47.1% of at least bachelor degree graduated, 28.2% employees are diploma standard, and 22.4% or subjects have at least master degrees to PhD. Therefore, the researcher expected most of the respondents are able to give reliable feedback throughout this study in determining their mental workload and its significant effect on mental health and job satisfaction level.

Most medical laboratories in significant hospitals offer multidisciplinary expertise to complement operations with other medical services within that hospital. In Hospital Tunku Azizah, Pathology Department is operated by two major divisions: Pathology Laboratory (PL) and Genetic Laboratory (GL). Here, from 85 respondents, the researcher

has recruited 45 subjects from PL and 40 subjects from GL. This study recruited various medical profession from both divisions to get an equal response and feedback regarding the research questions. Demographic data shown 37.6% are MLT, 36.5% are Science Officers, followed by 12.9% are among Specialist, and 11.8% are Medical Officers who directly work hands-on in this laboratory. This data has proven that the test's complexity required higher expertise from many medical professional backgrounds in assisting the service efficiencies by Senft D et al., (2017). In addition, laboratory services include areas such as medicinal chemistry, hematology, immunology, immunohematology, anatomy, microbiology, and molecular biology. Therefore, specialists in medical laboratory services produce reliable laboratory evidence required to validate the diagnosis. It also requires a good team member to ensure the results are highly accurate, ASCLS (2019). As a result of high volume samples and test demands by another medical discipline, a very high level of performance is expected of the pathology team. For information, this Pathology Department operates 24 hours/day to ensure all tests requested are processed within the timeline, either elective, routine, or urgent basis. Due to this, some of the workers in this department are required to work extra hours such as overtime, shift work, or even on-call basis to ensure the continuity of operations with promising outcomes. To be specific, this study also determines the average working hours per week among the research subjects. Data have shown, 50.6% (N=43) of employees worked on average 41 to 46 hours per week, and there are 43.5% (N=37) of subjects work more than 46 hours per week. Here, we can anticipate that staffs in this department have high working hours with high workload levels to cater to the high volume of samples requested by wards, clinics, and other hospitals.

Last but not least, data demographic also analyses the service period among research subjects. The finding showed that 54.1% of the total subject has less than 10 years working experience followed by 38.8% (N=33) with a period of 11 to 20 years working

experience, 5.9% of subjects had more than 21 years working experience, and only one respondent had greater than 30 years' service experience. In this context, we will discuss the relationship between scales of mental workload level and its effects on their mental health status and job satisfaction based on their experiences.

5.3 Significant Level of Mental Workload

The study has indicated that most of the respondents are burdened by significant mental workload with at least the mean percentage of 37.26% to 83.14% mental workload from all four dimensional model of CarMen-Q. In this analysis, the mean overall total mental workload is at least 52.23 (SD=12.193). These results have included all task demands related to (cognitive, temporal, and performance demands) and subject experience are emotional demands. Based on the assessment conducted, performance demand resulted in the major task demand among all task demands with M=82.17 (SD=14.59). According to Rubio-Valdehita et al.,2017, performance demands refer to the need to perform and measure the individual's responsibilities. From here, the researcher could have referred to the volume of sample specimens ordered by a physician to support their medical impression. The high volume of specimens, either routine or urgent, required the laboratory technologist, scientist, doctors, and specialist conducts such a complex analysis and produce accurate results, which is overly burdensome. In addition, medical laboratory workers usually have multiple procedures conducted concurrently at the same time, such as preparing slides, pipetting and centrifuging samples, performing machine analysis, and reviewing microscopic analysis. Most likely, performance demands attributed to these multiple tasks needed to be accomplished (Rogelberg, 2017) by the staff. The investigator found, based on measurements, that the existing fixed laboratory workstation was built at a height of 900 mm. This workstation required workers to sit for a long working hour on a high stool which is considered unacceptable ergonomic

workstation sets-up. Here, job overload, confusion, pessimistic career perceptions, weak work environment, and workstations are also predictors of mental workload, based on Ana María Rodriguez-López, Susana Rubio-Valdehita, and Eva María Díaz-Ramiro (2020), and these results have an important theoretical implication. This study points out that the uncertainty and negative future expectations about their job caused by the COVID-19 pandemic can also causes burnout and increasing mental workload. In this context, an expectation can be drawn out by performance demand results that there may be performance deterioration among the employees without them realizing it by these multiple factors.

Cognitive demand followed as the second-highest demand with M=52.25 with SD=12.89 that reflects most of the employees are required to do compounded information processing and attentional due to the complexity that demands a thorough analysis process decision making (Rubio-Valdehita et al., 2017). In this finding, the researcher can relate factors attributed to this issue due to the complexity of the procedures, laboratory sampling process, and analysis. Thus, even with the enhanced COVID-19 standard operative procedures (SOP's) and existing work processes, test output still needs to be accurate and reliable. Besides that, high-risk lab procedures such as r-PCR for COVID-19, Hepatitis B, and Elissa HIV serology screening may have exposed the lab operators to many types of potential hazards such as physical hazards, biological hazards, and chemical hazards during work. Therefore, all these requirements and processes may have triggered higher cognitive demand among staff in accomplishing their task on time.

The third and fourth mental workload dimensional analysis are temporal and emotional demand. The study revealed that although temporal and emotional demands are the last two mental workload dimensional demands highlighted here, both dimensional figures show prominent figures with at least M=43.42 and M=37.255, respectively. According to

Rubio-Valdehita, the dimension of the temporal demand refers to the speed to complete the task. In contrast, emotional demands are the demands related to how the task makes the employees feel nervous, anxious and stressed (Rubio-Valdehita et al., 2017).

As temporal demands reflected the speed and timeline required to complete the test and lab analysis. Thus, most of the lab tests ordered on an elective or routine and urgent test basis, and the staff over here has a standard timeframe to fulfilled in performing the lab request and generates an accurate result. Hereby, for a routine sample, the test is processed within four hours from the time sample is received. Thus, the result is required to be released in the Hospital Information System (HIS) within the period given to ensure the continuity of patients cares. Usually, different types of tests required different completion timeframe per sample. For an urgent sample, most of the tests are required to perform and complete within one hour since these results are very crucial in managing patient care in wards or clinics. Therefore, researchers able to associate this temporal demand contributed by the nature of the work process in this department based on their client charter, which demanding quick responses and producing end results on short notice (Meijer GA et al.,2009).

For emotional demand, this finding can be associated with emotions and attention allocated by most staffs' due to the complexity of the work process, which required zero errors in specimen's analysis. In fact, inaccurate sample analysis may lead to misdiagnosed or medical error management, which can contribute to any potential medicolegal case. Therefore, great attention and commitment must be allocated during the diagnostic process by every each of the laboratory workers. Thus, in a pandemic situation, it has increased the concern and self-worrying among staff while managing the unknown sample status. Reflects the previous COVID-19 incident that occurred in this department, it has increased the sense of nervousness and anxiousness among them while

processing the samples. They had a feeling that was potentially risking their safety and health if any misconduct or exposure to highly hazardous specimens such as COVID-19, hazardous viruses, and bacteria during this period. This study shows that the current pandemic directly impacts cognitive, emotional, performance, and temporal demands and in the presence of unhealthy psychological syndrome in workers who carry out their work in close contact with people or hazards (Ana María Rodriguez-López et al.,2020). The finding supports the past studies that the increase of emotional strain is escalated by the cognitive dimension of a task (Cain, 2007).

Another mental workload experiment was conducted to show the prevalence comparison of mental workload between Pathology Laboratory (PL) and Genetic Laboratory (GL). Based on the finding, there is no major compression of this four-mental workload dimensional between PL and GL division. Both divisions experience quite a similar level of mental workload demands, with performance demand stated as the highest form by both divisions with M=82.17 to 84.0 mean percentage followed by cognitive demand with at least M=57.18 to 61.58. Even though the complexity of molecular genetic study is slightly different than pathology laboratory discipline, the temporal demand finding is less the same with at least M=41.48 to 45.49, respectively. For this reason, the researcher found that the work process is still required the same timeline either on an elective, routine, or urgent sample basis. In this analysis, cognitive demand among GL staff seems to require a little higher with the value of M=40.12 compare to PL with a mean are at least 34.71(SD=15.55). Due to technology advancement, most of the tests under PL are automation processes, and certain diagnostic test a running manually, such as microscopic analysis, semi-auto diagnostic analysis, and biosafety cabinet based procedure likes r-PCR (COVID-19), Tuberculosis r-PCR, blood Smear& Culture, Cryopreservation of stem cells and etc. Even though current technology has to lead to advanced lab services, most diagnostic procedures under GL are still conducted manually or semi-automation

procedure basis, which required high attention demand, critical analytical skills and knowledge, (Surh. LC et al.,1997). This is due to the requirement of human expertise in analyzing tests such as DNA, chromosome, genetic traits samples compare to computer auto analyzed. Therefore, we can assume the minor gaps between this two-division are reflected in different work processes and requirements by each discipline.

Comparison of mental workload between profession group also conducted in this analysis, and the results revealed that staffs belonging to Specialist group facing highest mental workload underperformance demand and cognitive demand with mean values of (M= 92.73, M=73.03) followed by MLT with at least (M=84.79, M=53.02) Science Officers (M=81.51,61.94) and lastly Medical officers with performance demand dimensional required at least M=73.33 and cognitive demand with a mean value of 56.67. Here, finding justify the performance demand among specialist were higher due to their responsibility to receive all the referral cases, act as head of sub-unit, verified and authorized all results generated by the team and also act as a key person in managing the operational matter in every sub-discipline this department. Therefore, their results of performance demand and cognitive demand seem to be higher than other professions under this department. Analytical and critical thinking skills are required in every each of these specialists. It is because they are one who acts as a decision-maker in this department. Even so, all of the employees under this department are the main player and play an important role in this organization. MLT usually runs as a front liner under this department due to their job scope to process all primary samples, either common orderable samples such as biochemistry, microbiology, and hematology specimens. Those samples are processed and analyzed by MLTs even on a manual, semi-auto, or even automation basis. Daily, nearly 370 lab test were requested by the physician in wards and clinics, which demanding them to complete the test in a routine or urgent manner. Definitely, the study can relate that they are the second-highest group required high-level

performance demand. Apart from these two professions, definitely Science Officers and Medical Doctors also experienced similar circumstances under this department. Both professional performance demands showed at least M=73.33 to M=81.50, and their cognitive demand is at the level of M=61.94 and M=56.67. Under the scheme of Management and Professional, they have a responsibility to supervised MLTs performance and to troubleshoot errors at medium level management. Thus this group is assigned to performed more complex analysis on a manual or automation basis. Based on the hierarchy of responsibilities under this department, Specialists are at the top rank as head of the unit, specialist in the sub-discipline, or even act as head of the department. They are then followed by Medical Officers at the managerial level together with Science Officers. Medical Laboratory Technologists are the main successor in this team, assisted by Hospital Attendant. Therefore, the differences in this mental workload level are related to the individual and roles responsibilities in ensuring good productivity (Meijer GA et al.,2009).

Last but not least, in assessing the level of mental workload among Pathology Department staff during pandemic COVID-19, the researcher also conducted a prevalence comparison of all four mental workloads dimensional with three working hours' group per week. Here we want to analyze, were there any differences in level mental workload among staff based on their average working hours per week. In general, based on finding in chapter 4, staff who worked more than 46 hours per week had higher performance demand, cognitive demand, temporal demand, and emotional demand compare to another two groups. Again, performance demand showed as the highest dimensional of mental workload among workers who work more than 46 hours per week with at least (M=87.03, SD=12.57) and for staffs who works on average 41 to 46 hours per week, their performance demand is at a level of (M=80.77). Thus, for staff who work under standard hours per week, their performance demand is at least (M=74,67, SD=7.303). Based on

these values, it is significantly proven that workers who work longer hours required greater performance demand which they are expected to handle more massive samples or specimens and ties with carried forward samples during their duty working on-call, overtime, and shift. For instance, this group of workers usually involved in a complex procedure that required long hours to complete the lab test, such as cryopreservation stem cells procedure, molecular genetic study, and many more. These sets of tests required greater layers of work process before samples' analysis. In addition, this work process is significantly related to higher cognitive demand level. The complexity of the procedures with enhancement standard precocious during processing and analyzed samples had triggered their cognitive capacity. Besides, those who work more than 41 to 46 hours per week or even longer showed their cognitive demand is at least M=59.45 to 60.62 compares to those who worked normal 8 hours per day and less than 40 hours per week. In common, employees who work normal working hours are anticipate feeling more relax and stable. The output showed the level of cognitive demand among this group is at least M=46.00. Significantly, based on this finding anticipated that workers who work longer hours might experience an adverse effect on their health, even their psychology. The conclusion of long hours of work by Allan (1997) and Bakker et al. (2003) could adversely affect the attitudes and activities of workers, such as job satisfaction and attrition. Green and McIntosh (2001) observed that longer working hours are likely to reduce employee health. Green (2004) recorded that the job satisfaction of workers declined during the same time that occupational pressures increased.

5.4 Mental Health Status Among Pathology Department Staffs

5.4.1 Depression, Anxiety & Stress Scale Among Staffs

Referring to the second research objective in determining mental health status among healthcare workers in the Pathology Department during COVID-19. Statistical analysis (refer to Table 4.12) found that the highest percentage, i.e., 32.9% (N=28) of employees, reported anxiety symptoms varying from low to very severe anxiety. For information, the cut of scores for DASS-21 screening under this study are scales of severe to very severe symptoms. From 85 subjects recruited, results screening found two staffs having severe anxiety symptoms and another two staffs with very severe symptoms. Based on the follow-up interview, subjects feel concerned with their occupational safety during this pandemic due to unknown exposure to any biological hazard. Thus, most staffs are still unfamiliar with the latest standard precautions in preventing potential cross-infection during work. Indeed, strengthening COVID-19 SOPs and enhancement of work-process has slightly increased the anxiousness among workers since their mindset understands they are surrounded by the source of hazards such as harmful viruses and bacteria. This stigma was due to a previous incident that occurred in April to Jun 2020, where three of the Pathology Department staff contracted COVID-19. Therefore, it has caused temporary trauma among them since they are required to undergone COVID-19 screening and quarantine several cycles. Feeling anxious and stress while waiting for the screening result has given them a lesson to be more extra cautious and careful during work or socialising. Anxiety is present unconsciously, resulting in a person experiencing fear (Ghaderi et al., 2009). According to Gardner and Bell (2000) in (Yazid & Noriah 2014), anxiety can be identified by the presence of feelings of anxiety or depression as a result of a situation of fear. Somehow, past research studies claimed that some anxiety disorder is normal and even moderate anxiety levels able to enhance workers' performance. However, severe anxiety hinders the cognitive ability of the individual's work

performance (Bomble & Lhungdim, 2020; Ghawadra et al., 2019; Standing et al., 2004).

Apart from feeling anxious, some staff found to develops mild to very severe depression, with at least 23.5% of 85 subjects had the symptoms. Even though that overall percentage is quite high, only one staff had to be referred to Psychiatric and Mental Health Department HTA because she was exhibiting very severe depression symptoms, and the rest of 76.5% (N=65) are remaining normal. In spite of this, management should tackle the finding to implement any significant control measures in managing their mental health while working during this crucial period and ensuring continuity of operations. The general observational survey by the researcher found that workers feel uncomfortable with recurrent COVID-19 cases reported, and yet they have no choice, like other industries, to remain work from home. As part of the frontline under these essential services, they need to equip themselves to serve the nations in ensuring the quality of health among the public and clients in good conditions. However, with small numbers of manpower running the business in this department, they also experience losing manpower due to quarantine requirements. For instance, staff who not classified as PUI or PUS are required to recover and back up the services and praying their team-player who under surveillance remaining non-detected to COVID-19. Meanwhile, due to pandemic SOPs, the department had to restrict the social gathering among staff in work compounds such as the pantry, prayer room, and restroom. Staff also mandatorily demand to put on a face mask and avoiding social contact. This has lessened the social connection among staff, which significantly affects the quality of social relationships among them. Based on (Patwary et al., 2019), this situation may cause communication errors or breakdown in the organisation, which may lead to any organisational crisis. In the meantime, staff who have earned co-worker assistance appear to feel a strong sense of personal accomplishment, and this fact is reinforced by Charoensukmongkol et al. (2016), which showed that encouraging co-workers would improve personal achievement while helping

to prevent emotional fatigue and depersonalization at the same time.

Despite the COVID-19 factor, depression is often associated with mood disorders (Standing et al., 2004). Since the respondents of the survey conducted among employees who are working in the laboratory, the number of having depressive symptoms is consistent with findings by (Cohidon et al., 2010; Stansfeld & Candy, 2006), which suggested that unfavorable social setting in the healthcare facilities leads to higher depressive symptoms that are also attributed by determinants such as manpower issues, lack of control over the work process, insufficient materials and knowledge to produce quality work, difficulties to build cooperation at work and last but not least the work environment factor. Furthermore, time pressure is also associated with this significant finding as the organisation is obliged to meet a tight test completion timeline that is set by the department client charter and at the same time required to complete other tasks requested by their supervisors. In the analysis by Cohidon et., this observation is confirmed. It indicates that depressive symptoms are elevated by repetitive requirement for strict deadlines to be accomplished, a variety of tasks to be performed concurrently, and frequent disruption when executing a task. These risk factors are very much consistent with the high mental workload for performance task demand and cognitive task demands, which was reported in the previous subsection.

Apart from depression and anxiety symptoms, screening DASS-21 also consists of a stress element. Based on screening conducted, data shows 8.2% (N=7) respondent has developed stress symptoms. Occupational stress is very common in industries, which able to causes poor performances and productivity and lead to organisation crisis. The occurrence of stress is the combination of reactions such as emotional, cognitive, behavioral, and physical due to inability of coping and high levels of arousals in facing extreme adverse conditions (Standing et al., 2004). Out of 7 subjects with stress

symptoms, one person has been advised to get a proper assessment by Psychiatric and Mental Health Departments HTA because of very severe stress symptoms. Even though the level of mental workload is remarkably high among staff, most of the employees are able to cope with it, where data have proven 91.8% (N=78) respondent has normal scores of DASS-21 for stress symptoms. Somehow, these little remarks of stress symptoms work as an indicator of the management level in addressing relevant stress management actions among staff. More efficient management of the psychological, physical, and environmental changes caused by the pandemic is essential since the exposure to these stressors has been remarkable throughout these months. Thus, a set of recommendations for the department to improve the fit between the organization and the employees to better adapt to the work environment is essential (Susana Rubio-Valdehita, 2020).

5.5 Relationship Between Mental Workload & Depression, Anxiety and Stress Scores

A collection of correlation study was performed to determine the relevant association between high mental workload on mental health status relating to the second goal of this report. Here, a study reveals a major association between mental workload, depression, anxiety, and symptoms of stress among workers in the Pathology Department Hospital Tunku Azizah.

From the correlation analysis, identified total mental workload has a moderate's correlation with all DASS-21 elements with r values of 0.431** with stress symptoms, r = 0.415** with anxiety symptoms, and last but least with depression symptoms with an r-value of 0.367**, (Referring to Table 4.17). Another category that is potentially vulnerable to mental health consequences during COVID-19 is frontline staff such as police and healthcare employees (Chen et al. 2020). The critical value of self-care for

these frontline workers in COVID-19 was illustrated by numerous publications on mental health issues. This has already been discussed in a series of guidelines on research goals for mental health linked to COVID-19 (Holmes et al., 2020). Therefore, it is essential to determine a control measure to improves their mental health during this pandemic moment, which is related to their mental workload. Get into details of this four-dimensional mental workload relationship on depression, anxiety, and stress symptoms, analysis data shows a significant strong positive correlation between emotional demand with all mental health screening elements. Here, Pearson correlation between emotional demand with all DASS-21 are significant with $r = 0.547^{**}(p<0.01)$ with stress symptoms, anxiety with $r = 0.522^{**}$ ($p<0.01$) and depression with $r = 0.563^{**}(p<0.01)$ (Referring to Table 4.17). These results have proven that high emotional demand may contribute to workers to develop any anxiety, stress, and depression symptoms. The emotional influence of the job demand on the workers, such as anger and contribute to unmet or even psychological problems, according to Rubio-Valdehita et al., 2017.

Meanwhile, correlation analysis between temporal demand and performance demand with mental health status was also found significant. The correlation results between these two mental workloads dimensional with stress, anxiety, and depression elements are significant positive correlates with r values of 0.296^{**} ($p<0.01$) to r values of 0.323^{**} ($p<0.01$). Therefore, higher performance demand and temporal demand due to the high volume of tests ordered and standard timeframe comply to client charter has significantly influenced stress symptoms to occur among staffs. This norm is very common in industries, which able to causes poor performances and productivity and lead to organisation crisis, Kumar (2016). Therewith, the occurrence of stress is the combination of reactions such as emotional, cognitive, behavioral, and physical due to inability of coping and high levels of challenges which may be exposed to any adverse conditions such as mental health symptoms even in the low or earliest stage (Standing et al., 2004).

Supporting this previous finding, a study by Nieuwenhuijsen, Bruinvels, and Frings-Dresen (2010) observed that high expectations had impairing health and well-being impacts, such as a heavy workload or time constraint. Therefore, the management level must be able to manage the manpower issue and workload at one time. Task distribution is important to practice in this organization; the manager should able to enriched the staff's skills and assign relevant workload to each subordinate. This may help in reducing the stress level among staff and promotes a healthy working culture in the organisation. Shittu et al. (2018) observed that vast numbers of corporate staff often take on more responsibilities which need to be done within a limited amount of time, bringing a mix of deadlines and more demanding workloads to Lin, Wong, and Ho (2015).

Last but not least, correlation analysis between cognitive demand with stress symptom shows the acceptable weak relationship with r values of 0.217* and $p < 0.05$. This result has a parallel finding with the past studies, which revealed a profound magnitude of mental health issues with the increase of cognitive demand (Cox-Fuenzalida, 2007; DiDomenico & Nussbaum, 2008; Silva, 2014). Even the stress level among subjects are acceptable, and management is recommended to highlights this correlation finding as an early indicator in preventing potential organizational crises such as negative turnover among potential staff either they transfer out or resigned. Naqvi et al. (2013), Idris et al. (2010), and Ayed et al. (2014) have done such a study and have found that work stress is related to job satisfaction and that workers have a high tendency to quit their organization because they are not able to cope with stress at work all the time. The risk factors that lead to this significant result may also have strong impacts on the correlation as the researcher feels that the cause for all risk factors is interconnected. Besides that, employees' overloaded role that is presented by the result of performance task demand data also influences depressive disorders among employees. It leads to fatigue, loss of interest in working, and lack of energy due to sleep deprivation for having to meet the

demand of their numerous tasks (Kumar, 2008; Standing et al., 2004). In conclusion, the management level is suggested to outline significant preventive and control measures to reduce the significant effect between high mental workload with mental health status among staff.

5.6 Relationship Between Mental Workload & Job Satisfaction

A significant number of studies on the phenomenon of work satisfaction have been carried out over the last three decades (Acker, 1999; Jayaratne & Chess, 1984; McLean & Andrew, 2000; Poulin, 1995). Most of the studies conducted showed that heavy workload is an indicator of lower job satisfaction (Jayaratne & Chess, 1986). According to the descriptive study data analysed, it was found that most of the respondents in the Pathology Department have a high workload and partly moderate level of lack of job satisfaction among them.

The researcher would like to identify the relationship between mental workload and job satisfaction among pathology workers, contributing to the final objective. Study output revealed, only workload and stress satisfaction variables have a significant correlation with temporal demand dimensional and total mental workload. Pearson correlation analysis shows a significant with 2 tailed between temporal demand with the workload and work stress satisfaction variables with r values of 0.294** and r values of 0.311**. This finding is partially acceptable with the second hypothesis, where there is a significant relationship between high-level workload towards job satisfaction. Again, temporal demands are defined as the speed to complete the task, while emotional demands are the demands that are linked to the measure by which the task makes the employees feel nervous, anxious, and stressed. From these aspects, the researcher can relate these results are synchronized to the speed and timeframe allocated to complete the laboratory test. This has influenced the moderate's satisfaction level among workers towards workload

and work stress during the pandemic. For example, from time to time, increased numbers of patients have contributed to an increased workload for all staff, contributing to a decreased level of workplace satisfaction and a direct effect on workers daily life at the same time, WHO (2018). Therefore, a previous study backed the argument that the amount of workload increases from 1995 to 2011 and finds that job satisfaction declines with the rise in workload (Lea et al., 2012).

5.7 Relationship Between Work Environment with Job Satisfaction

Finally, Pearson correlation analysis has shown that the working environment is statistically had a significant correlation with job satisfaction (Referring to Table 4.20). This means that when the working environment within an organization is in a satisfactory state, this will be increasing the level of job satisfaction among the Pathology Department staff. The findings of this study are also in line with the study conducted by Lin et al. (2019), Winfred and Simon (2019), in which they indicate that a good working environment will have a significant positive impact on job satisfaction. Through descriptive analysis conducted on thirteen questions that have been documented using a 4-point Linkert scale and the results found questions marked with WE1 (I enjoy with my co-workers) showed the highest mean value (nearing to 3.00). This indicates that many respondents find that having a good working relationship between workers is a good indicator of high job satisfaction. Many respondents are satisfied with the relationship between staff members. A good relationship within the organization can ensure that all work is carried out as efficiently as possible, and this will have a high impact, especially in the patient care process.

CHAPTER 6: CONCLUSION

6.1 Introduction

In the research context, we are now complying with the final research objective, which outlines the significant recommendation in managing mental workload management, improving mental health status and job satisfaction level among Pathology Department workers based on research findings and also to make a conclusion of this study.

6.2 Conclusion

This study has shown a significant relationship between mental workload with mental health status and job satisfaction among healthcare workers in the Pathology Department of Hospital Tunku Azizah. The range of mental workload of these subjects is within mean percentage of 37.25% to 83.14% for the four dimensions studied. This study examined the mental workload level has found to be related to mental health status and job satisfaction among staff of the Pathology Department at Hospital Tunku Azizah in Malaysia. All these mental workloads dimensional accounts for at least a mean percentage of 52.34% at which has a significant relationship with mental health elements such as depression, anxiety, and stress. Thus, this study found the task's complexity, such as extensive procedures, scientific laboratory tests, and exposure to hazardous samples and conditions, contributes to workers' mental health status and job satisfaction. Hence, Temporal demand and Cognitive demand showed the most prominent high mental workload dimensional among subjects with M=83.14, SD=14.46 and M=52.25, SD=12.89. Again this is related to a high volume of tests and the complexity of the laboratory procedures. Thus, mental health screening conducted found 8.2% of subjects reported stress symptoms, 32.9% had anxiousness, and 23.5% developed depressive

symptoms. In addition, most of these employees have a modest level of satisfaction with their jobs, a career satisfaction study showed. Correlation analysis found a significant medium to high relationship between four mental workloads dimensional with DASS-21 elements. Pearson's correlation showed a strong 2-tailed correlation between emotional demand with stress, anxiety, and depression elements with r values of 0.547**, 0.522**, and 0.563**. Thus, the other three dimensional of mental workload also shown a reasonable correlation on mental health status. This proves that performance demand, cognitive demand, temporal demand, and emotional demand have influenced healthcare workers' mental states due to existing operational requirements and the current pandemic COVID-19 situation. Surprisingly, job satisfaction is slightly affected by these mental workload levels, probably due to workers' reasonable coping skills. In conclusion, this study has proven that the current COVID-19 pandemic situation has significantly affected healthcare workers' workload and mental workload level. Therefore, control measures should be taken to promote a healthy working culture and improve occupational mental health status and organizational psychology among employees. In nutshell, employees are the keys of success in every organization. Healthy workers and healthy working cultures can ensure the consistency of organization productivity and achievement

6.3 Recommendations for Improvements to be Implemented at Hospital Tunku Azizah

6.3.1 Pandemic COVID-19 Control Measures Recommendation

1. Since the trend of this pandemic COVID-19 nationwide is remarkably increasing, management of Pathology Department HTA is highly recommended to submit an early proposal requesting for COVID-19 vaccine allocations for its staffs.

2. All pathology staffs should be provided with adequate Personal Protective Equipment's such as 3 Ply Surgical Mask and Hand Sanitizers for basic standard precaution and level 3 (N95 Mask/ Face Shields/ Apron/ Full PPEs (Tyvec)/ Respirator) for clinical care management at zero cost to all employees. This is complying with the requirement under Section 15(2) Occupational Safety and Health Act 1994.
3. Pathology Department is recommended to engage with Infectious Control Unit Hospital Tunku Azizah in organizing continuous training for PPE's applications and maintenance to all staff. Improper PPE's management and disposal may contribute to cross-infection among staff during this pandemic period.
4. Pathology Department is recommended to collaborate with Occupational Safety and Health Unit Hospital Tunku Azizah to conduct relevant risk assessments such as Hazard Identification, Risk Assessment and Risk Control (HIRARC) and Job Safety Analysis (JSA) to determine the level of risk and hazard in most manual laboratory procedures comprehensively.
5. Each department must mandatorily practice temperature screening, scanning My Sejahtera barcode, and COVID-19 declarations at the interdepartmental level. This will assist hospital management in managing the pandemic crisis efficiently.
6. The organization is recommended to exercise the recommendation by *Majlis Keselamatan Negara* (MKN) and Ministry of Health (MOH) with implementing Work from Home (WFH) policy for those who are non-clinical disciplines. This is purposely to reduce the numbers of the worker at one time and preventing potential occupational cross-infection.
7. Management is recommended to reevaluate hygiene management frequency by Clinical Support Services Concession Company in Hospital Tunku Azizah. In this context, during the pandemic period, all equipment, clinical and non-clinical working

compounds, and high touched surface or areas are required to be sanitized frequently. Therefore, hygiene policy in this hospital is suggested to be reviewed and revised in line with currents hygiene maintenance required by Infectious Control Unit.

6.3.2 Recommendation on Mental Workload Management

1. Due to manpower constraints in this department and hospital. Department Pathology is suggested to structure a comprehensive proposal under "Anggaran Belanjawan Mengurus" Jabatan Perkhidmatan Awam Malaysia (ABM8) 2021/2022 for an optimum operational post through the Human Resources Division of the Ministry of Health (MOH) Malaysia and follow up by Human Recourses Division HTA. The Pathology Department is currently running by 95 employees from various designation and expertise where optimally required an additional 140 manpower as per appendix below.
2. In line with a high volume of samples received per month (Mean=2676, Standard Deviation= 454). Department is recommended to emphasize job rotation and relevant job enrichment to all employees in maintaining a healthy working culture and excellent productivity. The managerial level is suggested to empower subordinates by practicing job rotation to prevent stereotypes workload and improve worker's motivations. Hence this can improve working climates in departments parallel to Hierarchy Maslow Theories where human is required a dynamic and different personal needs. Therefore, the manager should optimize, promote, and model their subordinates based on their personal needs and organizational requirements.
3. Advancement in global biomedical technology is the current key strategy in improving healthcare services. Application on advanced laboratory devices and machines able to reduce the human workload, which nowadays, many lab procedures are automated or semi-automated processes. Therefore, the department is highly

recommended to structure a proposal paper to procure the newest or high technology medical assets relevant to assist the procedure and lab test on an operational basis.

4. Due to previous infectious history, the department is suggested to engage Psychiatric and Mental Health Department (PMHD) Hospital Tunku Azizah in performing gradual mental health screening for those who develop early symptoms of psychological illness. In this context, PMHD has initiated a DASS-21 screening under the public folder Hospital Information systems. All workers are recommended to utilise this free service to promotes greater occupational mental health management in the hospital.
5. The organization is also encouraged to organize departmental retreat trips or team building to promote healthy working culture, effective communication, motivation, problem-solving, stress management, and teamwork among employees. Thus, these programs able to works as a discussion medium in organizing as an annual organization strategic plan and performance.
6. Finally, improving workload management is by providing scientific and technical training to all staff. Improving competency to all staff able to increase the capacity and efficiency of work performance. Therefore, the department is recommended to request funding under the medical service practice Ministry of Health by Hospital Management. This *Modal Insan under Dasar Baharu* (RMK11) Ministry of Health is the main source to repay the training cost. Hence, the department should encourage staff to participate in an annual workshop, seminar, conferences organized by MOH or related local or international medical society.

6.3.3 Recommendation in Improving Mental Health Status & Job Satisfaction Among Staff

To improve the mental health problems occurring among the organization's employees, the researcher suggested several recommendations that are discussed in the following paragraphs.

6.3.3.1 Premier Medical Staff Health Services & Facilities

This health assessment should be done by incorporating consultation with a certified therapist to include the evaluation of perceived mental illness symptoms while giving social support or providing necessary treatments to employees who are extremely emotionally affected. Hereby, the department is suggested to engage with Psychiatric and Mental Health Department Hospital Tunku Azizah. It is also advisable for the employees to have gradual medical screening assisted by the Occupational Health Unit. By gradual medical checkup able to assist employees in ensuring their health and quality of life. Thus, Premier Clinic Hospital Kuala Lumpur provides medical services such as outpatient services, medical screening, communicable and non-communicable clinics, quit smoking, and KOSPEN-Plus screening. For instance, hospital staff can get a basic psychological screening or refer to respective medical expertise if required.

6.3.3.2 Stress Management Training & Consultation

Stress management training aims at improving positive attitudes, optimism, and coping skills for the employees (Thian et al., 2015). This can be done by collaborating with medical practitioners to organize workshops or classes focusing on relaxation, time management, and ways to deal with work stress (Gross, 2017). The researcher suggested

that this training be done in conducive areas (seminar room, hotel, government training facilities) on an annual basis and recommended for all employees to attend. The department also suggested collaborating with the Psychiatric and Mental Health Department and Occupational Safety and Health Unit to organize mental health programs such as Stress Management Workshop, Coping Skills Management, Leadership Coaching Program, and Mental Health Screening and Psychology Grooming Workshop. In addition, a pre-test of assessment of mental illness and post-test should be conducted during the workshop to review the change of attitude before and after session and scoring of the program's objectives. This program's effectiveness can be sustained within the organisation by monitoring mental health and providing immediate specialist care to the employees.

6.3.3.3 Rewards Approach

The researcher suggests that self-regulated work management can be improved by motivating the employees to achieve their work goals. This can be done by two methods, which are promotion-focused or prevention-focused (Thian et al., 2015). Development, growth, and change over losses promote promotion-focused individuals, while prevention-focused individuals respond to needs and avoid loss. Employees are expected to set and share their personal expectations with their managers and aim to work together to accomplish the accepted targets. Therefore, management is highly recommended to implement a rewards approach in improving job satisfaction and healthy working culture. Here, the department and Hospital can consider expending the staff quotas for Annual *Anugerah Khidmat Cemerlang* (AKC) by year. Thus, the department can initiate internal awards programs such as department achievement certificates for Best Staff of the Month and Best Staff of the Year, which anticipate boosting their motivation and satisfaction on work. Based on the Hierarchy of Maslow's theory, the human need to have self-

recognition once they achieved certain goals or targets. In conclusion, under this recommendation, the goals' achievement will be offered rewards by the top management, which will raise the employee's motivation and reinforce subordinates -supervisor relationships.

6.3.3.4 Welfare's & Staff Facilities

Social welfare is one of the methods for growing employee control of organisations. Thus, to take care of their welfare, such as providing prayer rooms, restrooms, and pantry, recreational facilities is worthy of expressing management concern. Hierarchy of Needs by Maslow revealed that humans required a few levels of need depending on their desires. In addition, Hospital Management level is highly recommended to provide certain recreational facilities such as gymnasium or multifunction compound for their post-pandemic socialising and recreational activities. Activities such as aerobic exercise, zumba, and in-house team building can strengthen employee relations and teamwork. In line with this, hospital management may consider to permit healthcare workers to utilised the Women Health Unit or Child Development Centre gymnasium as a temporary compound for workers after office hours.

6.3.4 Miscellaneous Recommendation

1. It is important to provide information on the environment of psychosocial practice to provide a context for such approaches. These problems are, from a realistic point of view, fundamental to organisational activities, and can be implemented into continuous change.
2. Recognize that "cultural change is at the heart of this quest." Treatment should be turned into a fully cohesive team atmosphere from the culture of the independent

specialist physician. Different contact patterns of clinicians, nurses, healthcare staff, and others are actually hampering this target. The scope of the care system needs a transition toward an open dialogue and collaboration community. To safeguard health results, such a reform is necessary.

3. Create and maintain a work environment in which participative management thrives. This can be achieved by increasing psychological empowerment while reaffirming and strengthening the role and skills of clinical leaders. Spur team development activities ensuring that team members value "the importance of shared responsibility, communication, and collective decision-making, and have a good understanding of their respective roles.
4. Strive to improve work motivation by creating proper work environments that enhance autonomy and enable technologists to work as subject matter experts. Work motivation can be increased by showing appreciation for work performed well. Appreciation must be expressed by both the general management as well as the direct leadership of nurse managers, who play a crucial intermediary role at the ward level.
5. Implement simulation training of extraprofessional teams to establish improved communication skills within practicing clinical teams.
6. Hospital management must acknowledge the relevance of enhancing job and communication satisfaction to clinical practice and organizational integrity. Half of the healthcare workers reported being overworked and exhibited a risk profile for burnout and mistakes, in turn, compromising patient safety. Management must provide positive leadership and pay attention to the particular factors that affect medical staff to enhance the operator's retention, reduce intention to leave, and avoid staff shortage.

6.4 Recommendations for Future Study

In this research, the Pearson Correlation analysis conducted in chapter 4 and analysis in chapter 5 between mental workload dimensional with DASS-21 founds reasonable significant. The level of mental workload required among staff shows more than 60 percent of subjects have normal mental health status compared to symptomatic with at least low to very severe. In this context, the probable factor for this finding is the acceptable coping skills among employees. Even initial data shows workers in this department dealing with massive samples and testing to conduct, their mental health and job satisfaction level are still in acceptable scales. Besides, a previous study conducted by other researchers in evaluating mental workload showed a significant relationship with burnout symptoms that not been examined in this research project.

Therefore, future researchers can evaluate burnout symptoms among healthcare workers during pandemic situations. In this study, the hospital involved is only specialist hospitals, so future research can be conducted in district hospitals, state hospitals, or health clinics where mental workload dimensional can be studied to determine its impact on mental health, psychological and job satisfaction among the healthcare worker. Plus, larger sample size can be used. The data collection period should be extended to allow more workers to participate in the study to have better data to analyze and discuss.

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