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Study on Shift Work Problems Among Security Team at University Tun Hussein Onn Malaysia, Parit Raja

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Abstract: Shift work, particularly that including night work has causes many health problems among workers in Malaysia. Literature shows on the issue document that health problem that risk human health and well-being, at both social and psychophysical stages. It starts with disruption of biological rhythms and perturbation of the social and family life that can negatively affect performance efficiency, health, and social relations. The aims of these study are to identify health problems and issues related to shift works and come out with new intervention plans to reduce the impacts to the shift workers. Data were analysed using SPSS software to get descriptive statistics on the demographic parameters of the respondents and to investigate the link between six factors affecting shift workers [1]. The ANOVA findings revealed a statistically significant difference at $p < 0.05$ for $n = 50$ to demographics of Position Categories and Education background, but no significant difference for Age Category and Years of Service in their judgements of shift work challenges at UTHM security team. Furthermore, Pearson Correlations analysis revealed a strong statistical correlation $r > 0.5$, $n = 50$, $p < 0.05$, between Behaviour Shift Workers, Workplace Accidents, Family and Social Life Problems, Health/Disease Problems, and Sleep/Wakeup Problems, but no statistical correlation between Organization /Department Roles and Responsibilities. Suitable interventions programs from the organization on shift schedule in according with ergonomic, health surveillance and social upkeep for shift workforces are vital precautionary and remedial measures. It allows employees to keep working without substantial health impairment.

Keywords: Shift work, Health Problem, SPSS, ANOVA Test

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1. Introduction

Shift work means, in general, any form of organization of work, different from the normal daily work, in which the operating time of a company is extended beyond the usual 8–9 hours to cover the entire 24 hours, through the alternation of different groups of workers [2]. Shift work is frequent among full- and part-time workers in countries worldwide. For example, shift work is reported in >15% of the workforce in many countries of Europe, North and South America, and Australasia [3]. Shift work is common in many professions, and the health or safety of others may be at risk if these workers' alertness and performance are impaired. For example, in the United States, approximately half of protective-service, food-service employees and nearly one-quarter of transportation and healthcare practitioners, support employees are shift workers [4].

Shift work has been empirically linked to a variety of diseases although evidence does not suggest an effect on all-cause mortality [5]. Three pathways have been implicated in associations between shift work and disease [6], disruption of circadian rhythms leading to sleep/wake disturbances, desynchronization of internal processes, and increased susceptibility to disease, disturbed socio-temporal patterns resulting from atypical work hours leading to family problems, reduced social support and stress and unfavorable changes in health behaviors such as increased smoking, poor diet and irregular meals.

1.1 Effects of Shift Work on Employees

Shift workers who engage in shift work or who work long hours can experience considerable disruption of family and social activities as many of these rhythms of the general population are oriented around the day. People engaged in irregular or "atypical" working hours, such as shift and night workers, are frequently out of phase with the society, as most family and social activities are arranged according to the day-oriented rhythms of the general population. Work, leisure and sleep times usually assume different "values" according to social timetables [7]

2. Materials and Methods

The survey questionnaires and interview method will be utilized in analyzing and investigating deeper on shift works effects to the shift workers. Planning was done to create set of questionnaires and survey forms to be distributed to the affected department and personnel. Besides, the approach to the workers who had experiencing side effects from their schedule rotation such as insomnia, sleep disturbance, fatigue, and etc. via interview process using face to face process. Furthermore, the survey will also expend to their superiors, peers, collegues as well as those having experience working with this kind of working environment. The measurement is based on previous practices for the current results.

2.1 Research Design

The researchers use the qualitative and quantitative approaches. The qualitative method used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. This type of approach basically suit for smaller group of samples and the result is not measurable and quantifiable. It is slightly different with the quantitative approach, which is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics. This method can give an explanation more specifically on the research topic without depending on feeding information from informants. The scope of research can be more independently.

2.2 Methods

The deliverable of the research design is derived from the research flowchart as per Figure 2.1. It was started from established problem statement, aim, objectives and research methodology and followed by literature reviews process. Both processes are mainly to achieve Research Objective (RO) 1 and 2. Then, the next stage is moved to questionnaires design and prior proceed to distribution survey questionnaire to the respondents, the pilot study for reliability test shall be done via purposive sample.

To ensure RO 3 is achieved, the researcher have to proposed new intervention plans before submit the complete report. By following steps from research flowchart means the researcher was completed the entire process of the research progress.

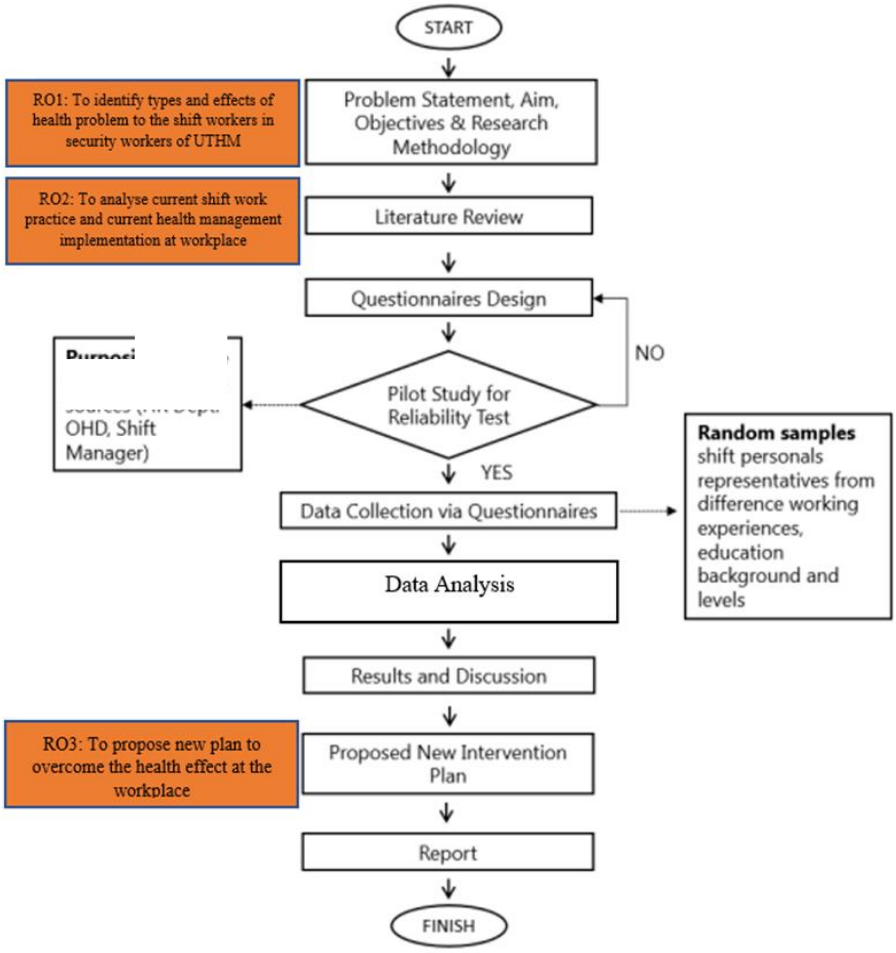

Figure 2.1: Flowchart for Methodology

2.3 Data Analysis

The process of analyzing the raw data from the survey questionnaires and interview session will be interpreted into computer software called Statistical Package for the Social Science (SPSS). SPSS is one of the most popular statistical packages which can perform highly complex data manipulation and analysis with simple instruction. It is designed for both interactive and non-interactive (batch) uses. Parts of functionalities of SPSS are to analyze the reliability tests, ANOVA, Pearson Correlation, and etc. [8]. This software facilitates the process of analysis and the result is more accurate. However, for

this particular study, the data being tested using reliability test, descriptive test, One-way ANOVA and Pearson's Correlation.

3. Results and Discussion

The total survey questionnaires distributed is 50 sets to be used for statistical analysis. Set of survey questionnaires were divided into few categories based on current shift works practices and problems in organization which is organization/department roles and responsibilities, behavioral shift workers, incident at workplace, health/disease problems and sleep/wakeup problems. The survey questionnaires are equally distributed to shift workers at UTHM security team.

3.1 Reliability Test

Reliability statictics show that the alpha for the competence scale (.80) demonstrated strong internal consistency, the alpha for the pleasure scale (.69) shows moderate sufficient dependability [9]. Thus, values more than.7 are regarded acceptable; however, values greater than .8 are preferred [10]

Based on reliability test conducted for the 50 samples with 18 survey questionnaires resulted .847 for Cronbach's Alpha and .836 for Cronbach's Alpha based on standardize items as shown in the Figure 3.1. Thus, data collection is legitimate for further research and debate on the effect of shift work on UTHM security teams.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.847	.836	18

Figure 3.1: Reliability Test

3.2 ANOVA Test

In the regression analysis, the ANOVA test was performed to examine the impact of independent factors on the dependent variables. The purpose of ANOVA is to determine whether or not there is a difference between the variable numbers.

i. Age Categories

From the Figure 3.2 below showed that the F for age categories is 0.151, significant value is .86. Since significant is larger than 0.05, null hypothesis is accepted. It is found that there is no significant difference between respondents' age categories in their perception to the shift work problems.

ANOVA

Age Categories

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.169	2	.085	.151	.860
Within Groups	26.251	47	.559		
Total	26.420	49			

Figure 3.2: ANOVA Test for Age Categories

ii. Position Categories

According to Figure 3.3, the F for position categories is 2.22 with a significant value of 0.12. Because significant is more than 0.05, the null hypothesis is accepted. It is discovered that there is no significant different in respondents' perceptions of shift work concerns across position types.

ANOVA

Position

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.133	2	.566	2.221	.120
Within Groups	11.987	47	.255		
Total	13.120	49			

Figure 3.3: ANOVA Test for Position Categories

iii. Year of Services

The Figure 3.4 below showed that the F for year of services is .112, significant value is .894. Since significant is larger than 0.05, null hypothesis is accepted. It is found that there is no significant difference between respondents' year of services in their perception to the shift work problems.

ANOVA

Year of Service

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.129	2	.065	.112	.894
Within Groups	26.991	47	.574		
Total	27.120	49			

Figure 3.4: ANOVA Test for Year of Service

iv. Education Background

Figure 3.5 showed that the F for education background is 2.101, significant value is .134. Since significant is larger than 0.05, null hypothesis is accepted. It is found that there no significant difference between respondents' education background in their perception to the shift work problems.

ANOVA

Education Background

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.821	2	.410	2.101	.134
Within Groups	9.179	47	.195		
Total	10.000	49			

Figure 3.5: ANOVA Test for Education Background

3.3 Pearson Correlation and Interferential Analysis

Pearson's Correlation is used to discover a relationship between at least two continuous variables. As shown in Table 3.1, the Pearson's Correlation value can range between 0.00 (no correlation) and 1.00 (perfect correlation). Correlations greater than 0.80 are generally regarded to be rather high. It is seen in the SPSS system.

Table 3.1: Pearson Correlation Strength (Pallant, 2007)

Correlation	Negative	Positive
None	-0.09 to 0.0	0.0 to 0.09
Small	-0.3 to -0.1	0.1 to 0.3
Medium	-0.5 to -0.3	0.3 to 0.5
Strong	-1.0 to -0.5	0.5 to 1.0

Furthermore, the analysis is being conducted using the results of survey questionnaires issued to 50 shift workers on the UTHM security team, as shown in Figure 3.6. Organization/Department Roles and Responsibility, Behavioural Shift Workers, Incident at Workplace, Family and Social Life Problems, Health/Disease Problems, and Sleep/Wakeup Problems are the six components of the survey questions. The specifics are discussed in the following topics.

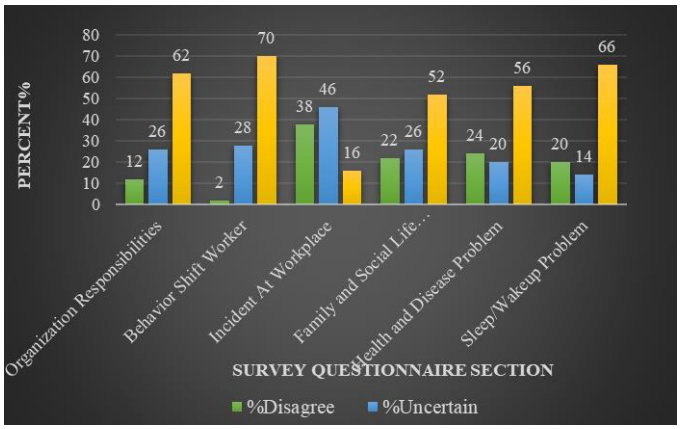

Figure 3.6: Survey Questionnaire Sections Distributed to Shift Workers of UTHM security team

i. Analysis on Organization/Department Responsibilities

Figure 3.7 revealed that the Pearson Correlation value, r = 0.173, indicated that Organization/ Department Roles and Responsibilities had no link with shift work difficulties. Because p = 0.237 is greater than the significant level of = 0.05, the null hypothesis is accepted. As a result, there is no statistically significant relationship between Organization/Department Roles and Responsibilities and shift work problems among UTHM security team shift workers.

Correlations

		Organization@ Department	Shift work problems
Organization/Department Roles&Responsibilities	Pearson Correlation	1	.170
	Sig. (2-tailed)		.237
	N	50	50
Shift Work Problems	Pearson Correlation	.170	1
	Sig. (2-tailed)	.237	
	N	50	50

Figure 3.7: Pearson Correlation between Organization/Department Role Responsibilities

Table 3.2: Details Analysis on Organization/Department Roles and Responsibilities

Descriptive Statistics				
	N	Mean	Std. Deviation	Remarks
The management has prepared comprehensive shift work procedure at workplace.	50	3.70	.974	Majority Agreed
Management has conducted frequent campaign and promotions on shift work risks to the shift workers	50	3.56	1.053	Majority Agreed
Management has provided advisory services to shift workers who's having health problems	50	3.68	1.039	Majority Agreed
Valid N (listwise)	50			

It demonstrated that UTHM Management had played important roles and responsibilities in providing all necessary needs to shift workers in order for them to execute their tasks, such as establishing shift work procedures, carrying out campaigns and promotions, and providing advisory services to shift workers impacted by the shift work environment.

ii. Analysis on Behavioral Shift Workers

Figure 3.8 demonstrated that the Pearson Correlation value, r = 0.516, demonstrated that Behavioral Shift Workers had no link with shift work difficulties. Because p = 0.00 is less than the significant level, < 0.05, the null hypothesis is rejected. As a result, there is a statistical association between Behavioral Shift Employees and shift work difficulties among UTHM security team shift workers.

Correlations

		Behavioral Shift Workers	Shift work problems
Behavioral Shift Workers	Pearson Correlation	1	.516**
	Sig. (2-tailed)		<.001
	N	50	50
Shift work problems	Pearson Correlation	.516**	1
	Sig. (2-tailed)	<.001	
	N	50	50

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

Figure 3.8: Pearson Correlation between Behavioral Shift Workers and Shift Work Problems

Table 3.3: Details Analysis on Behavioural Shift Workers

Descriptive Statistics				
	N	Mean	Std. Deviation	Remark
I frequently consume heavy meal, oily and sweet beverages during shift work	50	3.52	.995	62% Agreed
I'm smoker and shift work condition propelled me to smoke more frequent	50	3.24	1.451	50% Agreed
I didn't get enough rest during shift work off days due to replaced others, attended training, outstation, attended meeting, etc.	50	3.90	1.111	68% Agreed
I practice healthy lifestyles after shift work i.e. sport activity, cycling, jogging, gatherers with family members, vacations, etc	50	3.96	1.068	74% Agreed
Valid N (listwise)	50			

According to the statistical research, 62% of shift employees eat unhealthy meals, particularly those that were greasy and rich in sugar. It has directly led to shift workers' health concerns such as overweight, obesity, and diabetes. Out of a 50-person sample, only 50% of shift employees reported being influenced to smoke more during their shift. Shift employees on the UTHM security team stated that 68% did not receive adequate rest on their off days because of covering others, trainings, outstations, meetings, and so on. As a result of this event, shift employees experienced tiredness while working the following shift. In terms of healthy living activities, 74% of shift employees reported to conduct healthy lifestyles after shift work, such as sport activity, cycling, running, meetings with family members, vacations, and so on

iii. Analysis on Incidents at Workplace

Figure 3.9 demonstrated that the Pearson Correlation, r = 0.549, indicated that workplace accidents had no association with shift work issues. Because p = 0.00 is less than the significant level, = 0.05, the null hypothesis is rejected. As a result, there is a statistical relationship between Incidents at Workplace and shift work difficulties among UTHM security team shift employees.

Correlations

		Incidents at Workplace	Shift work problems
Incidents at Workplace	Pearson Correlation	1	.549**
	Sig. (2-tailed)		<.001
	N	50	50
Shift work problems	Pearson Correlation	.549**	1
	Sig. (2-tailed)	<.001	
	N	50	50

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

Figure 3.9: Pearson Correlation between Incidents at Workplace and Shift Work Problems

Table 3.4: Details Analysis on Incident at Workplace

Descriptive Statistics				
	N	Mean	Std. Deviation	Remark
I experienced involve with an accident at workplace during worked on shift.	50	2.18	1.119	12% Agreed
An accident frequently happened during shift schedule either mid night, early in the morning and during shift handover process	50	2.92	1.047	26% Agreed
Valid N (listwise)	50			

The aggregate result for Workplace Incident is 16% agreed, 38% disagreed, and 46% is uncertain. That instance, out of 16% who agreed, 12% were engaged in an accident while working on shift, and another 26% indicated an accident happened regularly throughout shift schedule, either late at night, early in the morning, or during shift handover procedure. According to the track record, an accident occurred at UTHM during shift work, and the root cause was most likely influenced by the shift work environment, weariness, alertness deficiencies, circadian rhythms, sleep issues, and so on.

iv. Analysis on Family and Social Life Problems

Figure 3.10 demonstrated that the Pearson Correlation value, r = 0.675, indicated that Family and Social Life Problems have no relationship with shift work problems. Because p = 0.00 falls below the significant level, = 0.05, the null hypothesis is rejected. As a result, there is a statistical relationship between Family and Social Life Problems and Shift Work Problems among UTHM security team shift workers.

Correlations

		Family and Social Life Problems	Shift work problems
Family and Social Life Problems	Pearson Correlation	1	.675**
	Sig. (2-tailed)		<.001
	N	50	50
Shift work problems	Pearson Correlation	.675**	1
	Sig. (2-tailed)	<.001	
	N	50	50

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

Figure 3.10: Pearson Correlation between Family and Social Life Problems and Shift Work Problems

Table 3.5: Details Analysis on Family and Social Life Problems

Descriptive Statistics				
	N	Mean	Std. Deviation	Remark
My social life was interrupted after work on shift	50	3.12	1.365	50% Agreed
Shift works has caused many problems such as family distant, gaps interaction with neighbor and societies, limited times with friends, etc.	50	3.20	1.294	48% Agreed
The quality times with family members is limited due mismatched shift works off days schedule with spouse and child off days	50	3.88	1.023	78% Agreed
Valid N (listwise)	50			

Overall, 52% of UTHM security team shift employees agreed, 22% disagreed, and 26% were unsure about family and social life concerns. 50% of respondents agreed that shift workers' social lives were disrupted after working on shift. However, 48% agreed that issues connected to family distance and gaps in engagement with neighbour, society, and friends are reported. Furthermore, 78% of respondents believed that spending quality time with family members is important.

v. Analysis on Health/Disease Problems

Figure 3.11 demonstrated that the Pearson Correlation value, r = 0.788, demonstrated that Health/ Disease Problems had no relationship with shift work problems. Because p = 0.00 is less than the significant level, = 0.05, the null hypothesis is rejected. As a result, there is a statistical relationship between Health/Disease Problems and Shift Work Problems among UTHM shift employees.

Correlations

		Health/Disease Problems	Shift work problems
Health/Disease Problems	Pearson Correlation	1	.788**
	Sig. (2-tailed)		<.001
	N	50	50
Shift work problems	Pearson Correlation	.788**	1
	Sig. (2-tailed)	<.001	
	N	50	50

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

Figure 3.11: Pearson Correlation between Health/Disease Problems and Shift Work

Table 3.6: Details Analysis on Health/Disease Problems

Descriptive Statistics				
	N	Mean	Std. Deviation	Remark
Shift works has caused me having diseases i.e. obesity, overweight, diabetes, high blood pressure.	50	3.08	1.259	36% Agreed
I feel extreme fatigue during shift work	50	3.66	1.042	64% Agreed
I frequently having stress at workplace especially during night shift and have to take medicine to reduce the stress	50	2.86	1.246	34% Agreed
Shift workers is risky to get diseases/health problems compared with normal working hours	50	3.70	1.313	68% Agreed
Valid N (listwise)	50			

The total result for Health/Disease Problems was 56% agreed, 24% disagreed, and 20% were uncertain. Issues associated to shift employees using medicine to reduce stress during night shift and shift work has resulted in shift workers having diseases such as obesity, overweight, diabetes, and high blood pressure impacts scored the same result (34% agreed). Fatigue issues are mentioned at 64%, with shift workers having the highest chance of developing diseases/health problems when compared to typical working hours at 68%. Shift employees on the UTHM security team are aware that they working in an unhealthy atmosphere, which has long-term consequences related to career concerns at the workplace.

vi. Analysis on Sleep/Wakeup Problems

Figure 3.12 demonstrated that there is no correlation between sleep/wakeup issues and shift work issues, with a Pearson correlation value of r = 0.703. The null hypothesis cannot be accepted since the value of p = 0.00 is less than the significant level of 0.05. As a result, there is statistical evidence linking sleep/wakefulness issues with shift work issues among shift employees in UTHM security team.

Correlations

		Sleep/Wakeup Problems	Shift work problems
Sleep/Wakeup Problems	Pearson Correlation	1	.703**
	Sig. (2-tailed)		<.001
	N	50	50
Shift work problems	Pearson Correlation	.703**	1
	Sig. (2-tailed)	<.001	
	N	50	50

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

Figure 3.12: Pearson Correlation between Sleep/Wakeup Problems and Shift Work

Table 3.7: Details Analysis on Sleep/Wakeup Problems

Descriptive Statistics				
	N	Mean	Std. Deviation	Remark
I have sleep problems since work on shift such as sleep schedule interrupted, wakeup on midnight and difficult asleep on night.	50	3.68	1.285	70% Agreed
I frequently asleep during day shift due fatigue and not enough sleep at night.	50	3.50	1.403	62% Agreed
Valid N (listwise)	50			

In general, shift employees at UTHM security team scored 66% in agree, 20% in disagreeing, and 14% unsure regarding sleep/wakeup issues. 70% of the 50 respondents reported having sleep issues as a result of their shift employment, including schedule interruptions, midnight wakeups, and difficulty falling asleep. In the meantime, 62% of shift workers have trouble falling asleep during the day shift as a result of exhaustion and insufficient sleep at night.

3.4 Proposed New Intervention Plans

i. Assessment for Fitness Test

The purpose of a fitness evaluation is to evaluate an employee's physical and mental fitness for their given job and the workplace environment. The identification of fitness evaluation that might be helpful in the design of employee health management programmes. The fitness test process should follow the right procedures, which include using the right techniques to identify fitness level that may have an impact on future work, performed by qualified assessors (Approved Medical Examiners), maintaining employee confidentiality, and adhering to local government and industry standards [11]

ii. Assessment for Medical Check up

Routine medical examinations are critical in health care. A routine medical check-up is described as a routine health-care process often performed by health-care institutions for both genders and all age groups at various intervals based on the patient risk factors [12]. The advantages of routine medical examinations are obvious. It can offer information on service users' health state, diagnose illnesses at an early stage, and aid in the planning of timely treatment, particularly for noncommunicable diseases like as cancer or cardiovascular disease.

iii. Healthy Meal Program

Firstly, management of security team can begin with determining how many meals security team will need each day. Then, give out a survey to all the security staff and find out who would participate in a work lunch program. Consider food allergies and ethical or religious restrictions. Many caterers offer vegetarian and vegan options and will often provide custom choices to accommodate people with allergies. Lastly, management can deal with cafeteria inside the UTHM to provide the specific healthy meal for the employee with the reasonable budget. This program not only can provide healthy meal for the employee, but can save time every time at lunch to find a restaurant. Therefore, this such of program

should be implemented at UTHM to produce a safety shift worker that free from chronic diseases that can harm health.

The proposed new intervention plans through adherence with existence procedures such as Assessment for Fitness Test, Assessment for Medical Check-up, Healthy Meal Program hopefully will reduce the severity of occupational health effects to the shift workers at UTHM. Meanwhile, management should closely monitor the implementation process to ensure that meaningful benefits are obtained.

4. Conclusion

As for the conclusion, research objectives have been achieved via identify problems statement, aim, objectives, and research methodology. Partly is reached during literature review process. The effects of shift work to shift workers were found either through physical observations or medical assessment. There are two categories of effects which is acute and chronic effects. Several studies reported long work hours are associated with increased fatigue, poor mood, poor recovery from work, and reduced perceived health after end of every shift as part of acute effect symptoms. There are few intervention measures in place to mitigate and reduce the impact of the effects on shift employees. It was chosen as a reference from the literature review process and internal processes accessible in the company. Researchers developed a few risk assessment techniques to measure the health associated with job difficulties, such as health surveillance, fitness to work program and medical assessment.

Lastly, the suggested new intervention strategies, if implemented in accordance with existing processes such as the Assessment for Fitness test, Assessment for medical check-up, and Healthy meal programme, should lessen the severity of occupational health impacts on shift employees at UTHM. Overall, all health and safety procedures in place are designed to meet the needs of shift workers, and management should use appropriate risk assessment tools from the start (shift worker selection), interval assessment, and periodic assessment to address early shift work problems among shift workers before they escalate to uncontrollable levels.

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