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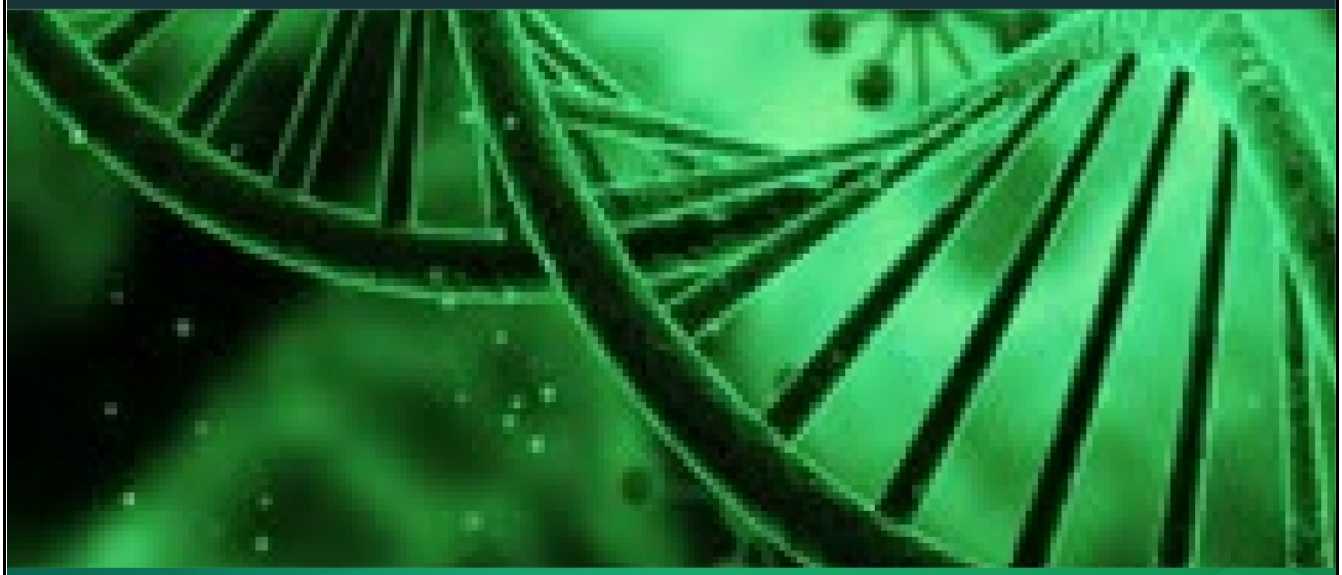

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Proceedings of the 2nd ICO-HELICS
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SLEEP QUALITY INDEX BASED ON WORK SHIFT AMONG FEMALE WORKERS IN DR HARDJONO S. HOSPITAL, PONOROGO

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ABSTRACT

Introduction: Most of health service provider, especially hospitals, require a 24 operational hours of work system. This requires the implementation of a rotating work (Work Shift) system to carry out the demands of its services. Working at noon (morning and afternoon shift) is normal working times according to human physiological conditions, but working at night would impact to the sleep cycle and regulation of human homeostasis. Various studies have found that workers on the night shift have a higher risk of injury or accidents due to work fatigue. Poor sleep quality is one of variable that is directly affected by work shifts that increase on female workers (Akerstedt et.al, 2009). This study aims to determine the impact of the night shift on sleep quality index (SQI) among female workers in Dr. Hardjono S. Hospital.
Methods: Data Collected in August 2019 and involved 80 female workers as respondents who were randomly selected using simple random sampling technique. Data were obtained through direct observation and interviews to respondents. Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI) which resulted in a sleep quality scale. Work shift variables (WS) are divided into : non-night shift (morning, noon) and night shift (morning, noon, night). To find out the differences in physical conditions of workers in each shift, the Heart Rate (HR) of the night shift workers measured in the end of three shifts (morning : 07-14.00; Afternoon : 14.00-21.00; and night :21.00-07.00).
Results: Using independent T-test analysis, there was a significant difference in Sleep Quality Index of workers with night shifts and non-night shifts ($p < 0.000$) with correlation coefficient 0.645. Workers with the night shift has PSQI score 15.155, 30 % higher than workers with non-nigh shift (PSQI Score 11.774).
Conclusion: Result shows that working at night decrease in sleep quality index by 30 % than working at day. Workers on the night shift have the highest HR at the end of the shift (86.311 bpm) while workers at noon shift have the lowest HR (85.2).

Keywords: Sleep Quality, Work Shift, Female Workers

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INTRODUCTION

Most of health service provider, especially hospitals, require a 24 operational hours of work system. This requires the implementation of a rotating work (Work Shift) system to carry out the demands of its services. Working at noon (morning and afternoon shift) is normal working times according to human physiological conditions, but working at night would impact to the sleep cycle and regulation of human homeostasis. Various studies have found that workers on the night shift have a higher risk of injury or accidents due to work fatigue [1].

Data from the International Labor Organization (ILO) [2] shows that almost every year, two million workers die caused by occupational accidents. The study prove that 32.8% of the total sample suffered from occupational fatigue. Fatigue can be caused by physical or mental stress. One of the fatigue factors is poor sleep quality caused by changes in the sleep cycle and cyrcardian rhythms due to jet lag or work shift [1].

Heart Rate Variability (HRV) is the best indicator to assess sleep quality. Workers with the night shift have a 28% higher risk to injury or accident [3].

Some studies try to explain the aspects of shift and work time. Working at night causing conditions that can interfere the ability to adapt both biologically and socially. Some work shift model studies are conducted to reduce the negative effects of work shifts. Anxiety and aggressiveness tend to increase at the end of a shift. Demographic aspects such as age and gender have attracted researchers, especially correlated to work shifts. Eldevik et al. [4] revealed that poor sleep quality in female workers was caused by a shift rotation less than 11 hours.

Mendelson [5] said that women need more sleep than men. Davis et.al. [6] in their study proved that there was an increase in reproductive hormones (FSH and LH) in female workers who worked on the night shift and rested during the day. While increase of these hormones risked breast cancer. Women also have a tendency to experience chronic fatigue, mood changes and coronary heart disease [7]. Differences between men and women both physiologically and biologically also have an impact to the work principles that are applied in the workplace. Based on the 2016 National Labor Survey (Sakernas) [8], the female workers dominated the health services and social worker (67.5%). Based on the issue explained, this study aims to determine the sleep quality based on shift difference among female workers.

This research located at Dr. Hardjono S. Hospitals Ponorogo which is the only public Hospitals managed by local government and operates 24 hours a day. More than half of the worker are female workers who are divided into medical and non-medical workers. Medical workers usually work in three [3] shifts devided into morning (7 am – 2 pm), evening (7 pm – 9 pm) and night shift (9 pm – 7 am).

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Nonmedical workers such as administrators, officers, janitors, laundry workers and more are usualy work at day only (morning and evening). Based on background explained in this section, this study aims to determine the sleep quality based on shift difference among female workers Dr. RSUD. Hardjono S. Ponorogo.

METHODS

Data collected in August 2019 and at Dr. Hardjono S. Ponorogo. Three hundred and sixty three (363) female workers became the population in this study. Using the cross-sectional sample size formula of Lemeshow [9], the minimum sample size needed is 62 respondents. In this study, 80 female workers participate as respondents who were chosen randomly using simple random sampling.

This study aims to determine the diference of Sleep Quality Index (SQI) on night shift workers and non-night shift workers at Dr. RSUD. Hardjono S. Ponorogo. The independent variable is work shift (WS) which is categorized into night and non-night shifts. Dependent variables is sleep quality Index (SQI) measured on a numerical scale with Pittsburg Sleep Quality Index (PSQI) [10] Instrument and Heart Rate (HR) measured in the end of shift to find out physical conditions among female workers in each shift.

Data obtained through direct observation and interviews to respondents using Pittsburg Sleep Quality Index (PSQI) instrument and Heart Rate (HR). The work shift is divided into night and non-night shift.

RESULTS

The research data was collected during August 2019 and involved 80 respondents of female workers in the RSUD Dr. Hardjono S. Ponorogo. Four [4] respondents were missing during data collection because the information obtained was incomplete. So that total respondents involved is 76 female workers. The results of data analysis presented below.

Respondent Characteristics

This section describes the condition of the respondents descriptively to show the distribution of data and single correlation to the dependent variables. In this study, the characteristics of respondents represented by age, work period and distance to the workplace. These variables are chosen because it could become confounding variable to the sleep quality so they has to be controlled.

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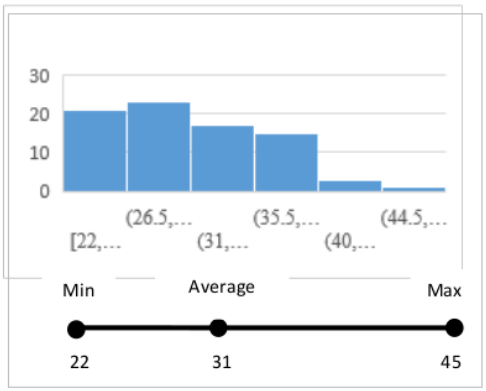

Figure 1. Age of Respondent

Figure 1 illustrates the distribution of age. Based on the data obtained known that the age of respondents ranged from 22 to 45 years with an average age 31 years. Correlative analysis using Pearson test shows that there is no relationship between age and PSQI score (p-value : 0.992) so the age has no effect on PSQI scores.

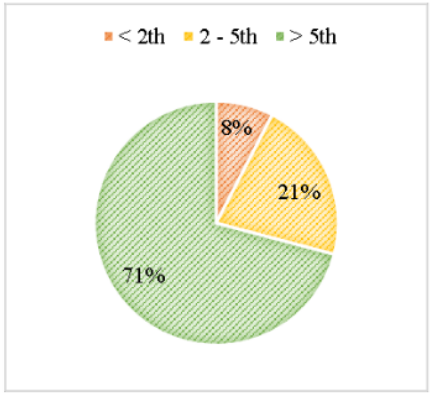

Figure 2. Work Period

Figure 2 shows that most of respondents or 71% have worked for more than 5 years. This period of work is important to know because it shows a person's adaptation to the work condition and circumstates. The longer someone works for a company, the easier they would adapt to workload and fatigue. Pearson correlation test shows that theres no correlation between work period and PSQI Score (p-value : 0.80). So that work period has no effect on PSQI scores.

Distance to the workplace

Distance to the workplace is also one of the factors considered in measuring sleep quality. The longer the time someone takes to the workplace, the earlier they must get ready for work. This might reduce someone's sleep hours. Pearson test

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shows that theres no correlation between distance and PSQI Score (p-value:0.743) So that distance has no effect on PSQI scores.

Sleep Quality Index Based on Work Shift among female Worker

The PSQI score indicates a person's sleep quality problem based on their sleep experience for the past month. The greater the PSQI score, the poor the quality of sleep. The following figure shows the result of analysis of PSQI score data on female workers with night shifts and non-night shifts.

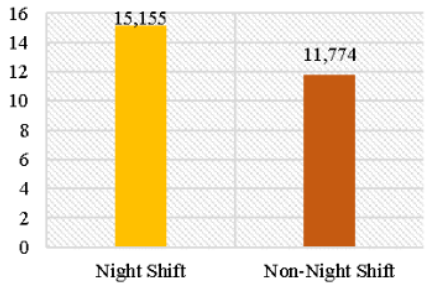

Figure 3. The diference of PSQI score of night and non-night shift workers.

Based on figure 3, the night shift workers have an average PSQI score of 15.155 or 30% greater compared to the non-night shift workers (11.774). The results of data analysis using the independent sample t-test between PSQI and work shift shows a significant difference between the PSQI scores among night shifts workers and non-night shift workers (p-value : 0.00). This is indicate that if other variables are constant, the sleep quality among workers affected by the implementation of the night shift.

To find out the differences in physical conditions of workers in each shift, the Heart Rate (HR) of the night shift workers measured in the end of three shifts (morning : 07-14.00; Afternoon : 14.00-21.00; and night :21.00-07.00). The result of analysis showed by following figure

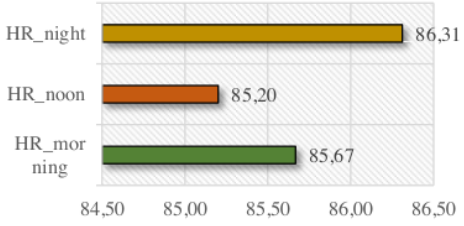

Figure 4. Heart Rate in the end of shifts

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Figure 4 shows that workers on the night shift have the highest HR at the end of the shift (86.311 bpm) while workers at noon shift have the lowest HR (85.2). however, the annova test did not show a significant difference of HR between those three shifts. The result of anova test shows that theres no difference of physical condition among workers in the morning, afternoon and night shift.

DISCUSSION

Shift work is associated with reduced heart rate variability among men but not women [11] Shift work is an essential component of modern clinical workplaces, and it has been associated with assorted maladies, including: sleep disruption, fatigue, cognitive impairment, accidents, injuries, depression, metabolic and gastrointestinal disturbances, and increased risks for diabetes, cardiovascular disease, and cancer [12–17]. The American Academy of Sleep Medicine defines the term "shift-work disorder" as the presence of excessive sleepiness or insomnia associated with working shifts.

Multiple pathways potentially explaining the link between shift work and adverse health outcomes in the figure 5.

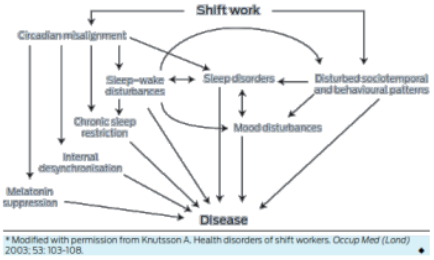

Figure 5. A Health Disorder of shift workers

From the figure 5 we can see that shift work indirectly cause sleep disorder through circardian misalignment [18].

Melatonin and cortisol are hormones that determining circadian rhythms and the quality of sleep in general. This following fgure shows Circadian Rhythms of Melatonin and Cortisol and Circadian Misaligned refers to Meijer et al., [19] with Proactive fatigue countermeasures :

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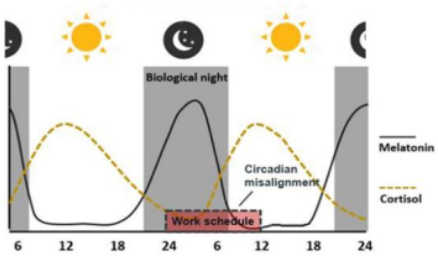

Figure 6. Circadian Rhythms of Melatonin and Cortisol and Circadian Misaligned

In adults, the melatonin onset typically occurs during low cortisol secretion. The production of melatonin starts in the evening, and it slowly prepares your body for resting while the cortisol starts secreting in the morning when you need to wake up. The work schedule in the biological night would cause circardian rhythm as shown in figure 6.

Marrie A. Jensen [20] in her research, did a shift intervention to the night shift worker that define into 2, 4 and 7 consecutive night shifts and recovery days to see how the consentration of melatonin and cortisol hormones production change.

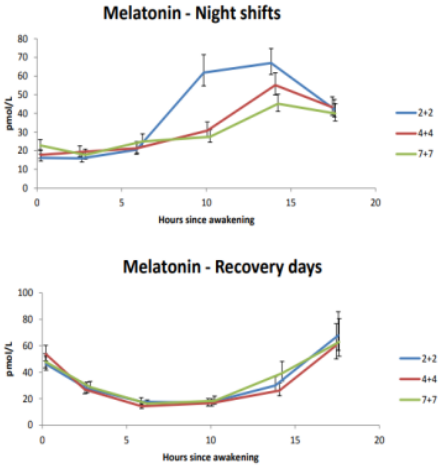

Figure 7. Melatonin concentration estimates plotted against hours since awakening for night shifts and recovery days

There was a significant difference between the interventions in the rhythm of melatonin on the days with night shifts. The concentration of melatonin was highest on the 2+2 intervention.

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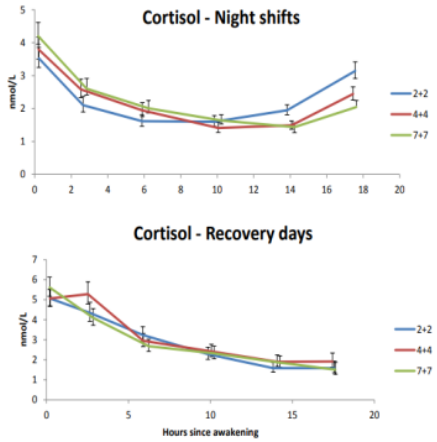

Figure 8. Cortisol concentration estimates plotted against hours since awakening for night shifts and recovery days

There was a significant difference between the interventions in the rhythm of cortisol on the days with night shifts. The lowest concentration of cortisol was reached 8:50 hours after awakening on the 2+2 intervention.

In summary of the hormone results showed that the diurnal rhythms of melatonin, and cortisol all changed differently to an increasing number of consecutive night shifts: the amplitude of melatonin rhythm was suppressed, but did not show any change in phase. The diurnal rhythm of cortisol phase delayed with an increasing number of night shifts, but did not show any changes in amplitude.

The results also showed no differences between the interventions in the rhythms of melatonin, cortisol and testosterone on the recovery days [20].

CONCLUSION

Using independent T-test analysis, there was a significant difference in Sleep Quality Index among female workers between night shift workers and non-night shift workers ($p < 0.000$). Female workers who work the night shift have the highest HR at the end of the shift (86.311 bpm) while workers at noon shift have the lowest HR (85.2). Result shows that night shift workers had decreased sleep quality (increasing PSQI Scores) by 30 % than workers with non-night shifts.

We also suggest based on discussion that the implementation of night shift not more than two days in a row then followed by at least two recovery days.

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REFERENCES

[1] Maurits LS. Faktor dan penjadualan shift kerja. Teknonin. 2008;13(1):18–22.
[2] International Labor Organization. The World Day for Safety and Health at Work in 2013 focuses on the prevention of occupational diseases. [Internet]. 2013 [cited 2019 Jul 25]. Available from: http://www.ilo.org/safework/events/meetings/WCMS_204594/lang--en/index.htm
[3] A. R. Burton K., Rahman Y., Kadota A., Lloyd U. VC. Reduced heart rate variability predicts poor sleep quality in a case–control study of chronic fatigue syndrome. Exp Brain Res. 2010;204(1):71–78.
[4] Eldevik MF, Flo E, Moen BE. Insomnia , Excessive Sleepiness , Excessive Fatigue , Anxiety , Depression and Shift Work Disorder in Nurses Having Less than 11 Hours in-Between Shifts. PLoS One. 2013;8(8).
[5] M. Mendelson A., Borowik A.S., Michallet C., Perrin D., Monneret P., Faure P., Levy J.L., Pépin B. WPF. Sleep quality, sleep duration and physical activity in obese adolescents: effects of exercise training. Pediatr Obes. 2015;11(1):26–332.
[6] Davis S, Mirick DK, Chen C, Stanczyk FZ. Night Shift Work and Hormone Levels in Women. Cancer Epidemiol Biomarkers Prev. 2012;21(4):609–19.
[7] Anies. Kedokteran Okupasi. Yogyakarta: Ar-Ruz Media; 2017.
[8] Statistik BP. Survei Angkatan Kerja Nasional (SAKERNAS), 2016 [Internet]. 2016. Available from: sirusa.bps.go.id/sirusa/index.php/dasar/pdf?kd=5&th=2016
[9] Lemeshow S, Jr DWH, Klar J, Lwanga SK. Stanley Lemeshow, David W Hosmer Jr, Janelle Klar, and Stephen K. Lwanga. World Health Organization; 1990.
[10] Carole B, Msn S, Gnp ANP. The Pittsburgh Sleep Quality Index (PSQI) The Pittsburgh Sleep Quality Index (PSQI). Vol. 29. New York; 2012. p. 1–2.
[11] Hulsegge G, Gupta N, Proper KI, Lobenstein N Van, Ijzelenberg W, Hallman DM, et al. Shift work is associated with reduced heart rate variability among men but not women. Int J Cardiol [Internet]. 2018;258:109–14. Available from: https://doi.org/10.1016/j.ijcard.2018.01.089
[12] Reutrakul S, Knutson KL. Consequences of Circadian Disruption on Cardiometabolic Health. Sleep Med Clin. 2016;10(4):455–68.
[13] Videnovic A, Hospital MG, Zee PC. Consequences of Circadian Disruption on Neurologic Health. Sleep Med Clin. 2016;10(4):469–80.
[14] IARC. Painting, firefighting, and shiftwork. IARC monographs on the evaluation of carcinogenic risks to humans. Lyon; 2010.
[15] Faraut B, Descartes P, Leger D. Neuroendocrine , immune and oxidative stress in shift workers. Sleep Med Rev. 2013;17(January 2018):433–44.

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[16] Folkard S, Lombardi DA, Tucker PT. Shiftwork : Safety , Sleepiness and Sleep. Ind Health. 2005;43:20–3.
[17] Claire C. Caruso, PhD R. HHS Public Access. Rehabil Nurs. 2015;39(1):16–25.
[18] Knutsson A. IN-DEPTH REVIEW : SHIFT WORK. Occup Med (Chic Ill). 2003;(53):103–8.
[19] Koos Meijer, Martin Robb JS. Shift Work Fatigue in the Petroleum Industry: A Proactive Fatigue Countermeasure. Soc Pet Eng. 2017;(9-11 October).
[20] Jensen MA. Working in the "Middle of the Night." University of Copenhagen; 2015.

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