Influence of hatha yoga exercise toward female sleep quality

Rizky Adani Talib¹, Yonathan Ramba¹, Mita Noviana¹
¹Physiotherapy Study Program, Faculty of Medicine, Hasanuddin University, Makassar
mitanoviana@med.unhas.ac.id

Abstract. The lack of knowledge about healthy lifestyles especially sleep quality is among problem in the society. The lack of sleep leads to decreasing in the sleep quality. The sleep is primary need for human being to live long lasting. The study aims to determine the influence of Hatha yoga exercise toward female sleep quality. The study was used quasi experiment design. The samples were 28 samples who met the inclusion criteria and selected with purposive sampling technique. The data was collected by using primary data collection through questionnaire based on Sleep Quality Index (PSQI) and analysed by using Wilcoxon test. The result of pre-test, post-test 1 and post-test 2 found significant score (p=0.000) that showed increasing score of sleep quality. hence, there was influence of Hatha yoga exercise toward female sleep quality.

1. Introduction
The good sleep had benefit effect on the health, both physically and psychological which helps improved productivity during daytime [1]. The sleep is main human need for good health and healthy life which sleep brain waves helped body relaxation [2]. The sleep is important for health and sleep disturbance (insufficient duration, poor quality and irregular timing) which lead to several disorders [3]. The sleep disturbance such as insomnia leads several psychiatric problem such as anxiety disorder, depression and metabolic diseases [4].

The insomnia affected 4-38% of North Americans and 6-70% of people in global which correlated with cognitive disorders (confusion, depression, anxiety, reduced memory, etc), accidents and reduced life quality [5]. The sleep disturbances prevalence increases with increasing age, 50% of people aged more than 65 years and 65% of nursing home residents experienced sleep disturbances [6]. Approximately, 80% of patients with schizophrenia spectrum disorder (SCZ) experienced disturbances including increased sleep onset latency, shorter sleep duration and reduced sleep efficiency [7].

Yoga is type of mind-body-spirit exercise which holistic treatment for people with several psychological dysfunctions [8]. The yoga exercise is help to relaxation effect which increase sleep quality. Yoga exercise consists breathing exercises (pranayama) and postures (asanas and mudras) [9]. Based on the observations, yoga practitioners experienced sleep disturbances (short sleep duration) which caused poor sleep quality. The study aims to determine the influence of Hatha yoga exercise toward female sleep quality.
2. Methodology
The study was carried out at Diamond Fitness Centre. This study was quasi experimental with time series design. The population was all members of yoga practitioners at Diamond Fitness Centre. The samples were 28 samples who met the inclusion criteria such as yoga practitioners at Diamond Fitness Centre who first time joining the yoga class, aged between 17 years and 35 years, no sleep medicine consumption and willing to be respondents.

The data was collected using questionnaire based on Pittsburgh Sleep Quality Index (PSQI). The sleep quality measurement was obtained before yoga, post-test 1 after 4 times and post-test 2 after 8 times of yoga class. The first yoga class was breathing (pranayama for 10 minutes, posture (asana) for 25 minutes and meditation (dyana) for 10 minutes with duration of 45 minutes.

The data was analysed with Wilcoxon test by using SPSS program to determine influence of Hatha yoga toward female sleep quality. The data was represented in form of tables and narratives.

3. Result and Discussion

3.1. Result
Table 1 shows that 15 respondents (53.6%) were aged between 17 years and 25 years and 13 respondents (46.4%) were aged between 26 years and 35 years. Meanwhile, 17 respondents (60.7%) were single and 11 respondents (39.3%) were married.

| Respondent characteristic | Total | Percentage (%) |
|---------------------------|-------|----------------|
| Age (years)               |       |                |
| 17-25                     | 15    | 53.6           |
| 26-35                     | 13    | 46.4           |
| Total                     | 28    | 100            |
| Marriage status           |       |                |
| Single                    | 17    | 60.7           |
| Married                   | 11    | 39.3           |
| Total                     | 28    | 100            |

There were 24 respondents (85.7%) had poor sleep quality and 4 respondents (14.3%) had good sleep quality during pre-test. In post-test 1, 21 respondents (75%) had good sleep quality and 7 respondents (25%) had poor sleep quality. Meanwhile, 26 respondents (92.9%) had good sleep quality and 2 respondents (7.1%) had poor sleep quality. The statistical test found there was changes in the sleep quality in yoga practitioners at Diamond Fitness Centre.

| Variable      | Categories | Total (n) | Percentage (%) | p-value |
|---------------|------------|-----------|----------------|---------|
| Pre-test      | Good       | 4         | 14.3           | 0.000   |
|               | Poor       | 24        | 85.7           |         |
| Post-test 1   | Good       | 21        | 75             | 0.000   |
|               | Poor       | 7         | 25             |         |
| Post-test 2   | Good       | 26        | 92.9           | 0.000   |
|               | Poor       | 2         | 7.1            |         |

Graph 1 shows that the median of pre-test, post-test 1 and post-test 2 were 8, 5 and 2. Based on boxplot graph, there were 2 respondents who have extreme or outlier values are far from average of respondents. In the second distribution of pre-test 1, the data was normal because the median value in
the middle. The whisker value is divided in the same way which there were no extreme value or outliers. The third distribution data or post-test 2, there were 2 respondents who have extreme values or outliers outside the average.

![Graph 1](image)

**Graph 1.** Changes in median of sleep quality after given Hatha yoga exercise

![Graph 2](image)

**Graph 2.** Boxplot graph comparison of sleep quality between pre-test, post-test 1 and post-test 2

3.2. Discussion

The yoga allowed work onset of two gland (thyroid and endocrine) which regulate the body calcium metabolism. The neck movement exercise such as squeeze movement (head movement upwards) for a while the blood flow around depressed muscle stopped. In this condition automatically, the brain need more blow to the body that is being depressed.

The result showed there was influence between Hatha yoga and female sleep quality. The sleep disturbances can occur due shift in the sleep (late sleep) and environment. The environment is condition that strongly support the sleep occurrence which positive or negative environment affected sleep quality. Khalsa (2004) found the yoga treatment had improved the sleep quality for 8 weeks interventions with 1 hour training session [10]. Hariprasad et al. (2013) there was benefit effects of 6 months yoga-based intervention on physical health, psychological health, social relationships and environmental domain of quality of life in elderly living in nursing homes [11].
Exercise lead the body released adrenaline hormone, serotonin and endorphin that helped the body feel better. In additions, exercise also helped secreting other hormone such as dopamine and serotonin hormones. The serotonin play roles in the sleep physiology such as homeostasis mechanism such as Synchronizing Region Bulbar (SRB) is located in the pons and medulla oblongata released serotonin and caused drowsiness leads to sleep.

The yoga postures and breathing techniques lead the mind and emotional to be calmer and more peaceful caused better sleep quality. The sleep pattern also influenced by external factors such as electronic gadgets, noise etc. Bruni et al. (2015) found teenagers bad sleep quality was correlated with electronic gadgets and number of devices in the bedroom [12].

4. Conclusion
In conclusion, there was significant influence between Hatha yoga exercise toward female sleep quality. The study is expected to be input and reference material for related research and further study are more able to control other confounding variables.

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