

SLEEP QUALITY INDEX COMPARISON BETWEEN URBAN AND RURAL POPULATION IN NORTH SUMATERA

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ABSTRACT

An estimated 150 million people worldwide and at least 17% of the population of developing countries experience sleep problems. The purpose of this study was to see an overview of sleep quality in urban and rural areas, Pantai Labu District. This study is a quantitative study with a retrospective cohort design. The population of this research is people aged > 18 years who live in Pantai Labu District, Deli Serdang Regency, North Sumatra Province. The comparison of exposure (rural) and non-exposure (urban) samples in this study was 1: 1 by taking a minimum sample of 91 people for each group, so that the total sample was 182 people. The instrument used was the Pittsburgh Sleep Quality Index questionnaire. The proportion of poor sleep quality is high in rural areas. The results of statistical tests found a significant difference in sleep quality between rural and urban population areas (P. value 0.01; alpha 5%). Rural residents are 1.5 times more likely to have poor sleep quality (RR 95% CI 1.14 - 1.98) than urban residents. A significant difference in sleep quality index scores is found in the disturbance indicator at the sleep stage where the villagers have an average score of 12 (moderate disturbance), compared to urban residents who have an average score of 9 (mild disturbance). Based on the topographical area, the proportion of people with poor sleep quality is quite high in rural areas which is probably due to several things, including community activities at night. Suggestions in the form of providing education to the public are important to do so that people care more about their sleep patterns by health center officers or other health workers. The community also needs to change behaviors that risk causing poor sleep quality. Keywords : Pittsburgh Sleep Quality Index, Sleep Quality, Urban and Rural Population.

1. INTRODUCTION

It is estimated that 150 million people worldwide and at least 17% of the population of developing countries experience sleep problems (Berhanu, et al, 2018). Sleep problems will cause poor sleep quality which has an impact on physical health in the long term, such as a significantly increased risk of heart disease which can lead to death (Augner, 2011). In addition, sleep patterns and sleep quality were also associated with obesity severity and weight-related behavior (Hayes, et al, 2018).

The factors that affect a person's sleep quality vary widely. In the urban community in Tehran, it was found that women, adults, widows and separated partners were the most important risk factors for sleep disturbances. Sleep disturbances can include snoring, sudden stop breathing, or waking up in the middle of the night (Asghari, et al, 2012). The prevalence of poor sleep quality is more common in women than in men. This difference can be due to differences in sex in which each person will produce different hormones (Asghari, et al, 2012). Pregnancy is one of the factors that makes a difference to sleep quality in women. The average pregnant woman had a Pittsburgh Sleep Quality Index score of 6.07 (95% CI 5.30 - 6.85) (D. Sedov, et al, 2018).

Age significantly affects sleep quality. Based on research describing the quality of sleep for people aged 43 to 71 years with a total of 2,114 respondents, it was found that PSQI scores increased in the older group. This increase illustrates that age is related to sleep quality (OR: 1.05; 95% CI 1.03-1.06) (Madrid-Valero, et al, 2017).

One of the things that distinguishes between urban and rural areas is work. This is evidenced by research conducted on female shift workers at PT. Sandratex in 2016. The results show that most female working women have a prevalence of poor sleep quality of 88.9% (Nuryanti, 2016).

In a study in urban areas using 411 respondents, it was found that the prevalence of poor sleep quality in urban communities was 42.58%. Meanwhile, in rural communities with a total of 443 respondents, the prevalence of people with poor sleep quality was 35.89%. The difference in the prevalence of people with poor sleep quality is 6.69% (Mondal, et al, 2018).

The high prevalence rate of poor sleep quality and the impact of this made researchers choose Sleep Quality. Then, the difference in the prevalence of poor sleep quality in urban and rural areas became the reason for the researchers to choose Pantai Labu Subdistrict to be the place of research which consisted of urban and rural areas. In addition, the work of fishermen, which requires working at night, puts the people of Pantai Labu Subdistrict at risk of having poor sleep quality.

2. METHODS

2.1. Types of Research

This study is a quantitative study with a retrospective cohort design, which is a study starting from dividing the group into rural and urban areas then assessing the outcome of each group's sleep index.

2.2. Reserach Sites

The research was conducted in Pantai Labu District, Deli Serdang Regency, North Sumatra Province.

The urban areas are Kelambir sub-district / village, Kubah Sentang, Denai Bird's Nest, Paluh Sibaji, Labu Pekan Beach, Pematang Monara, and Rantau Panjang.

The rural areas are Sei Tuan, Tengah, Durian, Ramunia Plantation, Ramunia I, Ramunia II, Denai Lama, Binjai Bakung, Denai Kuala, Pantai Labu Baru, Rugemuk and Bagan Serdang

2.3. Population and Research Sample

The population of this research is people aged > 18 years who live in Pantai Labu District, Deli Serdang Regency, North Sumatra Province. The comparison of sample exposure and non exposure in this study is 1: 1 by taking a minimum sample of each group is 91 people, so the total sample is 182 people.

The inclusion factor is people aged > 18 years who live in Pantai Labu District. Meanwhile, the exclusion factors were the community, immigrants, and non-permanent residents of Pantai Labu District.

2.3. Data Collection

Data was collected by interview, measurement of BMI (height, weight) as measured by microtoise and weight scales. The instrument used was a questionnaire regarding sleep quality and demographic data of respondents. Sleep quality was measured using the translated Pittsburgh Sleep Quality Index (PSQI) questionnaire.

2.4. Data Analysis

This study used a descriptive analysis in the form of frequency and cental distribution analysis. Meanwhile, to find the level of significance of the differences in the sleep quality index of urban and rural communities using the T-test statistic. Then to analyze the factors that affect the quality quality index using the Chi Square statistical test with a large risk using relative risk.

3.RESULT

The sample in this study consisted of urban and rural groups with 91 samples each.

Table.1 Distribution of Sample Characteristics

Variable		N	Mean	Median	SD	95% CI Of Mean
IMT (kg/m ²)	Rural	91	25.40	24.62	4.66	24.43 – 26.47
	Urban	91	25.36	25.73	5.30	24.25 – 26.46
Age (Years)	Rural	91	43.92	42.00	14.31	40.94 – 46.90
	Urban	91	45.12	46.00	13.51	42.31 – 47.94
Income (Rupiah)	Rural	91	1.539.560	1.500.000	1.275.211	1.273.984 – 1.805.139
	Urban	91	1.570.692	1.400.000	1.252.384	1.309.870 – 1.831.614

Based on Table 1, it is known that, in the Rural group, the average age of the sample is 43.92 years (SD 14.31, 95% CI 40.94 – 46.90), with an average score IMT 25.40 (SD 4.66, 95% CI 24.43 – 26.47) as well as average income 1.539.560 (SD 1.275.211, 95% CI 1.273.984 – 1.805.139). Meanwhile, in the urban group, the average age of the sample is 45.12 years (SD 13.51, 95% CI 42.31 – 47.94), with an average score IMT 25.36 (SD 5.30, 95% CI 24.25 – 26.46) as well as average income 1.570.692 (SD 1.252.384, 95% CI 1.309.870– 1.831.614).

Table.2 Comparison os Sleep Quality Index for Rural and Urbam Population

Variable		N	Mean	Median	SD	CI Of Mean	P
Sleep Quality Score	Rural	91	6.93	7.00	2.29	6.46 – 7.41	0.41
	Urban	91	6.62	7.00	2.91	6.01 – 7.22	
Sleep Quality Index Component 1 (Subjective Sleep Quality)	Rural	91	1.16	1.00	0.83	0.99 – 1.26	0.58
	Urban	91	1.10	1.00	0.79	0.93 – 1.26	
Sleep Quality Index Component 2 (Sleep Latency)	Rural	91	2.68	3.00	1.58	2.35 – 3.01	0.23
	Urban	91	2.37	2.00	1.87	1.99 – 2.76	
Sleep Quality Index Component 3 (Sleep Duration)	Rural	91	6.89	6.92	1.48	6.58 – 7.20	0.12
	Urban	91	6.54	6.83	1.61	6.20 – 6.87	
Sleep Quality Index Component 4 (Habitual	Rural	91	92.73	94.44	7.15	91.24 – 94.22	0.48
	Urban	91	91.78	95.83	10.50	89.59 – 93.97	

Variable		N	Mean	Median	SD	CI Of Mean	P
Sleep Efficiency)							
Sleep Quality Index	Rural	91	12.12	12.00	4.11	11.26 – 12.98	0.00
Component 5 (Step Disturbances)	Urban	91	9.78	10.00	4.49	8.84 – 10.72	
Sleep Quality Index							
Component 6	Rural	91	0.01	0.00	0.01	-0.01 – 0.03	1.00
(Use of Sleeping Medication)	Urban	91	0.01	0.00	0.10	-0.01 – 0.03	
Component 7 (Daytime Dysfunction)							
	Rural	91	1.26	1.00	1.00	1.06 – 1.47	0.85
	Urban	91	1.30	1.00	1.12	1.06 – 1.53	

Based on Table 2, it is known that in the rural group, the average sleep quality score for the sample is 6,93 (SD 2.29, 95% CI 6,49-7.41), with the index average Subjective Sleep Quality 1.16 (SD 0.83, 95% CI 0,99-1.26), index average sleep latency 2.68 (SD 1.58, 95% CI 2.35-3.01), index average sleep duration 6.89 (SD 1.48, 95% CI 6.58-7.20), habitual index average sleep disturbances 92.73 (SD 7.15, 95% CI 91.24-94.22), index average step disturbances 12.12 (SD 4.11, 95% CI 11.26-12.98), index average use of sleeping medication 0.01 (SD 0.01, 95% CI -0.01-0.03), and index average daytime dysfunction 1.26 (SD 1.00, 95% CI 1.06-1.47). In the urban group the average sleep quality score for the sample is 6.62 (SD 2.91, 95% CI 6,01-7.22), with the index average Subjective Sleep Quality 1.10 (SD 0.79, 95% CI 0,93-1.26), index average sleep latency 2.37 (SD 1.87, 95% CI 1.99-2.76), index average sleep duration 6.54 (SD 1.61, 95% CI 6.20-6.87), index average habitual sleep disturbances 91.78 (SD 10.50, 95% CI 89.59-93.97), index average step disturbances 9.78 (SD 4.49, 95% CI 8.84-10.72), index average use of sleeping medication 0.01 (SD 0.10, 95% CI -0.01-0.03), and index average daytime dysfunction 1.30 (SD 1.12, 95% CI 1.06-1.53).

Based on the results of the T-Test in Table 2, it is known that there is no significant difference between sleep quality in urban and rural communities on the variable (subjective sleep quality) (P value = 0.58), (use of sleeping pills) (P value = 1.00), and (daytime dysfunction) (P value = 0.85). There is a significant difference between sleep quality in urban and rural communities on the variable (sleep latency) (P value = 0.23), (sleep duration) (P value = 0.12), (usual sleep efficiency) (P value = 0.48), and (sleep disorders) (P value = 0.00).

Table.3 Analysis of factors that affect sleep quality

Variable	Sleep Quality						P	RR (CI 95%)
	Bad		Good		Total			
	n	%	n	%	n	%		
Territory								
Rural	71	78%	20	21%	91	100%	0.01	1.50 (1.14 – 1.98)
Urban	54	59%	37	40%	91	100%		
Gender								
Man	22	78%	6	21%	28	100%	0.32	1.09 (0.96 – 1.23)
Women	103	66%	51	33%	154	100%		
Smoking Behavior								
Active smoker	13	61%	8	38%	21	100%	0.52	
Pasive smoker	60	66%	30	33%	90	100%		
Not a smoker	52	73%	19	27%	71	100%		
Marital Status								
Single	7	70%	3	30%	10	100%	0.84	-
Married	101	67%	48	32%	149	100%		
Divorced	17	73%	6	26%	23	100%		
Education								
No School	26	74%	9	26%	35	100%	0.74	-
Primary School	47	70%	20	30%	67	100%		
Junior High School	26	63%	15	36%	41	100%		
Senior High School	22	66%	11	33%	33	100%		
College	4	66%	2	33%	6	100%		
Body Mass Index								
Obesity	70	72%	26	28%	96	100%	0.21	-
Normal	48	64%	26	35%	73	100%		
Less	7	58%	5	41%	12	100%		
Age								
Adult	98	66%	50	33%	148	100%	0.19	0.57 (0.26 – 1.23)
Elderly	27	79%	7	20%	34	100%		

Based on Table 3, several factors that influence sleep quality include regional factors, as many as 71 people (78%) of residents in rural areas experience poor sleep quality and as many as 54 people (59%) of residents in urban areas experience poor sleep quality. Based on these results, residents in rural areas experience a greater poor quality of sleep than urban communities and this has a significant correlation value, namely 0.01 $P < 0.05$. Then in the community, men experience more poor quality sleep than women, 78% of the male population experiences poor quality experience and 66% experienced by the female population. However, it does not have a significant correlation with a correlation value of 0.32 $P < 0.05$. Smoking behavior in this study did not affect sleep quality, the non-smoking respondents actually experienced the most bad sleep quality, namely 73% with a P value on smoking behavior with sleep quality of 0.52 $P < 0.05$. Respondents with divorced marital status experienced the most poor sleep quality, amounting to

73%, but with a P value of 0.84 $P < 0.05$, it means that there is no relationship between marital status and sleep quality. In the education variable, it was found that 26 people (74%) who did not attend school experienced poor sleep quality. A total of 70 people (72%) who were obese also experienced poor sleep quality but body mass index had no correlation with sleep quality with a P value of 0.21 $P < 0.05$. And finally, the elderly have a poor sleep quality of 79%, but there is no correlation between age and sleep quality of the population with a P value of 0.19 $P < 0.05$.

4.DISCUSSION

4.1. Sleep Quality and Topography

Based on the topographical area, the proportion of people with poor sleep quality in rural areas is (78%), and in urban areas is (59%). This study is in line with previous research conducted by Asghari et al (2012) on urban communities in Tehran. Based on this study, it is known that 37% of people have poor sleep quality.

4.2. Sleep Quality and Gender

Based on the results of this study, the proportion of poor sleep quality was male (78%) in both urban and rural areas. This study is not in line with research conducted in urban and rural areas in North 24 Parganas. Based on this research, it is known that the proportion of people with poor sleep quality, both in urban and rural areas, are women (Mondal, 2019). This is because gender differences will cause each person to produce different hormones that affect sleep quality (Asghari, 2012).

4.3. Sleep Quality and Age

Based on the results of this study, the quality of sleep is poor in rural communities in the 40-46 year age group. Whereas in urban communities, the quality of sleep is mostly in the age group of 42 - 48 years. Different results were obtained in research conducted in urban and rural areas in North 24 Parganas, which found that the highest proportion of poor sleep quality was in urban and rural communities in the 61-70 year age group.

4.4. Quality of Sleep and Last Education

Based on the results of this study, the proportion of urban and rural people with the highest quality of poor sleep is people who have no education (74%). The same results were obtained from research conducted at Adam Malik Hospital, Medan, which found that poor sleep quality was greatest in the higher education group, amounting to 57.1% (Mariani, 2019).

4.5. Sleep Quality and Marital Status

Based on this study, the frequency of urban and rural people with poor sleep quality was mostly those who were divorced. This is in line with research conducted in urban and rural areas in North 24 Parganas. It is known that the proportion of people with poor sleep quality, both in urban and rural areas, is divorced.

4.6. Sleep Quality and Income

Based on the results of this study, the proportion of urban people who have the greatest poor sleep quality is the group with an income of Rp. 5,600,001 - Rp. 6,400,000. Meanwhile, in rural communities, the proportion of the highest quality of sleep is in people with an income of Rp. 4,800,001 - Rp. 5,600,000. In another study conducted at Adam Malik Hospital, Medan, it was found that poor sleep quality was mostly found in the low income group, with a proportion of 54.5% (Mariani, 2019). Likewise, research conducted by Ningli (2019) states that low family economic status is associated with poor sleep quality.

4.7. Sleep Quality and Cigarette Consumption

The results of this study indicate that the proportion of poor sleep quality in urban and rural communities is found in the nonsmokers group. Conversely, according to research conducted in China, it is known that sleep disorders are more common in smokers than non-smokers (Lioa, 2019). Firdaus's research (2018) also found the same thing that the higher the smoking behavior, the higher the tendency for insomnia, which then determines the quality of one's sleep.

4.8. Sleep Quality and BMI

The results of this study indicate that the urban and rural communities who have the greatest proportion of poor sleep quality are obese people. This result is different from research conducted at Adam Malik Hospital, Medan, which found that the group with the largest proportion of poor

sleep quality was found in people with normal Body Mass Index, namely 41.2% (Mariani, 2019). The same results were found in a study conducted by Hayes (2018) that sleep patterns and sleep quality were also associated with the severity of obesity and behavior related to body weight.

Conclusion

Based on the topography area, the proportion of people with poor sleep quality was higher in the Rural group (RR = 1.50) and male (RR = 1.09).

Suggestion

Providing education by health center officers and other health workers to the community is important so that people care more and pay attention to their sleep patterns. The community also needs to make preventive efforts to overcome poor sleep quality so it is recommended that people be able to maintain the Body Mass Index so they do not experience obesity by not eating before going to bed at night, reducing the burden on the mind by doing worship before going to sleep, cleaning themselves and the bed to feel comfortable while sleeping, and reduce activities that can disrupt sleep patterns such as consuming coffee and cigarettes.

REFERENCES

- Andruškienė, J., Varoneckas, G., Martinkėnas, A., & Grabauskas, V. (2008). Factors Associated With Poor Sleep and Health-Related Quality of Life. *Medicina (Kaunas)*, 44 (3), 240-246.
- Asghari, A., Farhadi, M., Kamrava, S. K., Ghalehbaghi, B., & Nojomi, M. (2012). Subjective Sleep Quality in Urban Population. *Arch Iran Med*, 95-98.
- Augner, C. (2011). Associations of Subjective Sleep Quality with Depression Score, Anxiety, Physical Symptoms and Onset Latency in Students. *Cent Eur J Public Health*, 115-117.
- Berhanu, H., Mossie, A., Tadesse, S., & Geleta, D. (2018). Prevalence and Associated Factors of Sleep Quality among Adults in Jimma Town, Southwest Ethiopia: A Community-Based Cross-Sectional Study. *Sleep Disorders*, 1-10.
- Calhoun, D. A., & Harding, S. M. (2010). Sleep and Hypertension. *Chest*, II (138), 434-443.

- D.Sedov, I., E.Cameron, E., SheriMadigan, & M.Tomfohr-Madsen, L. (2018). Sleep Quality During Pregnancy: A Meta-Analysis. *Sleep Medicine Reviews* , 30, 168-176.
- Dina Mariani, R. A. (2019). The Relationship Between Quality of Sleep and Quality of Life of Patients in Medan, Indonesia. *ID Design Press* , 1-4.
- Firdaus, H. (2018). Hubungan antara Perilaku Merokok dengan Kecenderungan Insomnia pada Pekerja. *Skripsi* , 1-110.
- Ghadami, M. R., & Hu, W. (2018). Obstructive Sleep Apnea and Hypertension: Systolic Versus Diastolic Blood Pressure. *Obesity* , 26 (8), 1249-1250.
- Hayes, J. F., Balantekin, K. N., Altman, M., Wilfley, D. E., Taylor, C. B., & Williams, J. (2018). Sleep Patterns and Quality Are Associated with Severity of Obesity and Weight-Related Behaviors in Adolescents with Overweight and Obesity. *Childhood Obesity* (1).
- Madrid-Valero, J. J., Martínez-Selva, J. M., Couto, B. R., Sánchez-Romera, J. F., & Ordoñana, J. R. (2017). Age and Gender Effects on The Prevalence of Poor Sleep Quality in The Adult Population. *Gaceta Sanitaria* , 1 (31).
- Mondal, H., Mondal, S., & Chayan, B. (2018). Comparison of Perceived Sleep Quality Among Urban and Rural Adult Population by Bengali Pittsburgh Sleep Quality Index. *Advances in Human Biology* , 8 (1), 36-40.
- Munthe, I. P., Utami, R. Y., & Fujiati, I. I. (2017). Hubungan Kualitas Tidur Dengan Memori Jangka Pendek Pada Mahasiswa Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara. *Ibnu Sina Biomedika* , 1 (2).
- Ni Luh Putu Wulan Budyawati, D. K. (2019). Proporsi dan Karakteristik Kualitas Tidur Buruk pada Guru-Guru Sekolah Menengah Atas Negeri di Denpasar. *E-Journal Medika* , 1-7.

- Ni Luh Putu Wulan Budyawati, D. K. (2019). Proporsi dan Karakteristik Kualitas Tidur Buruk pada Guru-Guru Sekolah Menengah Atas Negeri di Denpasar. *E-Jurnal Medika* , 1-7.
- Nuryanti, E. A. (2016). Determinant Analysis of Sleep Quality in Woman Shift Workers at PT. Sandratex Year 2016. *Undergraduate Thesis* .
- Yanhui Liao, L. X. (2019). Sleep Quality in Cigarette Smokers and Nonsmokers: Findings from the General Population in Central China. *BMC Public Health* , 19 (808), 1-9.