

ORIGINAL RESEARCH

Sleep hygiene behavior among Balinese adolescent

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Abstract

Introduction: Sleep hygiene is very important for predicting the quality and quantity of sleep in adolescent students. Studies in recent years showed the number of adolescents who get sleep disturbances due to poor sleep behavior increased by 72.9%, however, only a few studies explored the sleep hygiene behaviour particularly from developing country setting. The purpose of this study was to know sleep hygiene in adolescent students particularly in Bali island.

Method: Design used in this study was descriptive analytic with cross-sectional approach. The population was all students of class X and XI in PGRI Negara High School. Total sample was 46 respondents. Data were collected by using modified Adolescent Sleep Hygiene Scale (ASHS) questionnaire and analyzed by using multiple linear regression test with a level of significance $p < .05$.

Result: The result showed that sleep hygiene for Balinese adolescents in terms of physiological aspect to have enough category (50%) and the cognitive aspect showed less category (71.74%). Most students have sleep hygiene behavior with good category (41.32%) on the emotional aspect and the sleep environment aspect on less category (45.65%). The sleep hygiene behavior of daytime sleep aspect having enough category (50%) and the sleep stability aspect on less category (43.48%).

Discussion and conclusion: It can be concluded that most of Balinese adolescents has sleep hygiene with less to moderate category. Further studies should be done to improve sleep quality through nursing intervention.

Key words

Sleep hygiene, Balinese, Adolescent

1 Introduction

Sleep is needed by adolescents for healthy development and maintenance of all body processes^[1]. In recent years, changes in sleep patterns occurred in many adolescents that caused a decrease the quality and quantity of sleep. Changes in sleep pattern in adolescents, include decreased in sleep duration, delay in bedtimes, sleep pattern differences between weekday and weekend, and changes in sleep quality. Sleep disturbances in adolescents were the result of poor sleep hygiene behavior^[2]. Sleep hygiene is the practice of behavior that improves sleep quality, sufficient sleep duration, and full preparedness during the day^[3]. Sleep hygiene is important for predicting the quality and quantity of sleep in adolescents^[4].

Sleep hygiene is different in practices across the globe, so does for the Balinese. Balinese was known to have a lot of rules, which directly and unconsciously bind society, ranging from individuals to groups in local development norms. Just one small example, the attitude toward sleep. The Balinese believe if someone is sleeping in the early evening, then that person will be short lived. Balinese also believe that the activity in bed (especially chatting with friends) can lead to problems and disputes ^[5].

Adolescents who have poor sleep hygiene may report lack of sleep and feel sleepy during the day. Adolescents who express inadequate sleep are susceptible to depression, anxiety and poor physical health ^[3]. Poor quality and quantity of sleep in adolescents can affect academic achievement, cause decreased motivation to participate in school, decreased alertness and concentration, adolescents become irritable, impulsive, and show sadness ^[6]. Another result of inadequate sleep quantity is the risk of obesity in adolescents. Some studies showed that a number of hormonal changes due to inadequate quantity of sleep can lead to increase calorie intake and the likelihood of obesity ^[4]. In recent years, several studies showed that the number of adolescents who have sleep disturbances is increasing. Based on the results of Noland et al studies ^[6], 91.9% of adolescents have inadequate sleep. In the study also reported that adolescents perform malicious behavior to help them sleep like sleeping medication (6%), smoking (5.7%), and drinking alcohol in the evening (2.9%). In Indonesia, a study conducted by Haryono et al year 2009 ^[7], showed the prevalence of sleep disorders in adolescents aged 12-15 years in East Jakarta as much as 62.9%. As much as 72.9% had awake and sleep time difference between weekday and weekend.

Initial survey by researchers of 10 students in PGRI Negara High School on March 14, 2013 showed most of students behavior indicates poor sleep hygiene. This indicated by most of them doing activity over the bed which means that they were not ready for sleeping. Using mobile phone and read some book over the bed was reported by all of the respondents. 50% students suffered of emotional experienced or taken their worried to bed, 90% going to sleep while listening music and 70% students take a nap more than an hour.

This objective of the study was to understand a sleep hygiene behavior for Balinese adolescents. This study would be useful for adolescent's parent and school to promote better sleep hygiene behavior.

2 Materials and methods

The design used in this study was descriptive analytic with cross-sectional approach. The population was all students of class X and XI in PGRI Negara High School involving 52 students. The sample in this study was 46 students who met the inclusion criteria. The inclusion criteria were students who attend school at the time of sampling. Sampling in this study was non-probability sampling (purposive sampling).

The sleep hygiene behavior measured by questionnaire which was modified from Adolescent Sleep Hygiene Scale (ASHS) ^[2] consisted of 21 items. Response options were scored as less for < 76, moderate for 76-95 and good for 96-126. The data was collected then analyzed using multiple linear regression test with a level of significance <0.05. The variables involved in this study were attitudes about sleep hygiene, subjective norms about sleep hygiene behavior, perceived behavioral to control sleep hygiene behavior and intention of sleep hygiene toward intention of sleep hygiene in adolescent.

Ethical considerations

The study was approved by The Health Ethics Committee, Airlangga University Surabaya. Respondents were informed that the study was voluntary and that they could withdraw at any time without permission. All participants provided informed consent. All participants were assured of the confidentiality and anonymity of their data, data stored in secured place.

3 Results

All of the respondents were active students at PGRI Negara High School, Denpasar district, Bali. Overall 32 males and 14 females were involved in this study with majority of them 17 years of age (39.13%) (see Table 1).

Table 1. Characteristic demographic of the respondents

No.	Respondents' characteristic		Σ	%
1.	Gender	Male	32	69.57
		Female	14	30.43
	Total	46	100	
2.	Age	16 years	10	21.74
		17 years	18	39.13
		18 years	14	30.44
		19 years	4	8.69
Total	46	100		

Table 2. Sleep hygiene for adolescent Balinese

No	Sleep Hygiene Behavior	Category			Total Σ
		Good	Enough	Less	
		Σ	Σ	Σ	Σ
1.	Physiological aspect				
	Drinks with caffeine (for example: coffee, cola, tea) after 6:00 PM				
	Doing a very active activities (for example: playing outside, running, physical exercise) during the 1 hour before bedtime	21 (45.65%)	23 (50.00%)	2 (4.35%)	46 (100%)
	Go to bed with a stomachache				
	Go to bed with feeling hungry				
2.	Cognitive aspect				
	Doing things that make feel very awake (for example: playing video games, watching television, reading) during the 1 hour before bedtime				
	Doing things in bed that keep awake (for example: watching television, reading)	4 (8.70%)	9 (15.56%)	33 (71.74%)	46 (100%)
	Go to bed and think about things to do				
	Go to bed and replay the day's events over and over in mind				
	Using a bed for things other than sleep (for example: talking on the mobile phone, watching television, playing video games, doing homework)				
3.	Emotional aspect				
	Experiencing things that make feel strong emotions (for example: sadness, anger, fear, worry) during the 1 hour before bedtime	19 (41.32%)	15 (32.60%)	12 (26.08%)	46 (100%)
	Go to bed feeling upset				
	Go to bed and worry about things happening at home or at school				
4.	Sleep environment aspect				
	Fall asleep while listening to a loud music				
	Fall asleep while watching television	11 (23.91%)	14 (30.44%)	21 (45.65%)	46 (100%)
	Fall asleep in a brightly lit room (for example: the overhead light is on)				
	Fall asleep in a room that feels too hot or too cold				
5.	Daytime sleep aspect				
	Take a nap >1 hour	11 (23.91%)	23 (50.00%)	12 (26.09%)	46 (100%)
6.	Sleep stability aspect				
	Sleep >1 hour past than usual bedtime, during the school day				
	Stay up >1 hour past than usual bedtime, during the school day	13 (28.26%)	13 (28.26%)	20 (43.48%)	46 (100%)
	Sleep >1 hour past than usual bedtime on weekends				
	Stay up >1 hour past than usual bedtime on weekends				

Table 2 showed that in terms of the physiological aspect, 21 adolescents (45.65%) have sleep hygiene behaviors with good category and 23 adolescents (50.00%) have sleep hygiene behavior with enough category.

In term of the cognitive aspect, 33 adolescents (71.74%) have sleep hygiene behavior with less category. Emotional aspect of 19 adolescents (41.32%) showed sleep hygiene behavior with good category. Reviewed from the sleep environment aspect, 21 adolescents (45.65%) have sleep hygiene behavior with less category. The daytime sleep aspect showed 23 adolescents (50.00%) have sleep hygiene behavior with enough category. Reviewed from the sleep stability aspect, 20 adolescents (43.48%) have sleep hygiene behavior with less category.

Table 3. The result of sleep hygiene hypothesis test for Balinese adolescent

No.	Variable	Determination Coefficient (r^2)	Regression Coefficient (B)	B	Sig.	Information
1.	Attitudes about sleep hygiene toward intention of sleep hygiene in adolescent	0.951	0.370	0.222	0.002	Significant
2.	Subjective norms about sleep hygiene behavior toward intention of sleep hygiene in adolescent	0.951	0.292	0.239	0.001	Significant
3.	Perceived behavioral to control sleep hygiene behavior toward intention of sleep hygiene in adolescent	0.951	1.424	0.566	0.000	Significant
4.	Perceived behavioral to control sleep hygiene behavior toward sleep hygiene behavior in adolescent	0.947	2.109	0.284	0.033	Significant
5.	Intention of sleep hygiene toward sleep hygiene behavior in adolescent	0.947	2.059	0.697	0.000	Significant

The statistical analysis showed that there were a significant effect of attitudes about sleep hygiene, subjective norms about sleep hygiene behavior, perceived behavioral to control sleep hygiene behavior and intention of sleep hygiene toward intention of sleep hygiene in adolescent (0.002; 0.001; 0.000; 0.033 and 0.000) with $p < .05$ (see Table 3).

Determination coefficient (r^2) between attitude about sleep hygiene behavior, subjective norms about sleep hygiene behavior, and perceived behavioral to control sleep hygiene behavior toward intention of sleep hygiene is 0.951. It means that 95.1% intention of sleep hygiene in adolescents can be explained by using those 3 variables. Determination coefficient (r^2) between perceived behavioral to control sleep hygiene behavior and intention of sleep hygiene toward sleep hygiene behavior is 0.947. It means that 94.7% of sleep hygiene behavior can be explained by using those 3 variables.

4 Discussion

The result showed that sleep hygiene for Balinese adolescents in terms of physiological aspect, cognitive aspect, emotional aspect, sleep environment aspect, daytime sleep aspect and sleep stability aspect respectively enough category (50%), less category (71.74%), good category (41.32%), less category (45.65%), enough category (50%) and less category (43.48%).

Behavior is a person's response or reaction to the stimulus (external stimuli) ^[8, 9]. According to Ajzen year 2005(10), behavior is a real action or activity undertaken. Noland et al year 2009 explains that sleep hygiene is the practice of some behaviors that optimize and promote good sleep so that individuals can do maximum activity during the day ^[6]. Sleep hygiene refers to good sleep behaviors then the individual can achieve restorative sleep. The importance of good hygiene sleep behavior is to improve the quality of REM sleep as well as maintaining adequate sleep duration.

Other study conducting by Kor and Mulan (2011) adolescent experiencing unstable phase of their life, this fluctuation may have an impact of the result of this study ^[3]. One would assume that they easily to change their behavior. Therefore,

sometimes the current behavior of the students, can be different from the behavior displayed next. As with most less dominant aspect was related to sleep hygiene students in this study were from the cognitive aspect. The majority cognitive aspect is doing things in bed that keep awake (majority using mobile phones), think about things to do, and replay the day's events over and over in mind. This result is consistent with that proposed by LeBourgeois et al year 2005^[2] which states that among both Italian and American adolescents, the emotional and cognitive domains of the ASHS were the strongest unique predictors of overall sleep quality. National Sleep Foundation year 2011^[11] also revealed the results of the same study that cell phone use, particularly texting exceed all other forms of technology use by 13-17 year olds just prior to bedtime. Adolescents who used their cell phones once a month or more were more likely to be tired during the day than those who did not^[12, 13].

Reviewed from the physiological aspect, Balinese adolescent most often doing a very active activities (majority running) during 1 hour before bedtime. Respondents in this study stated that their friend often invited them to gather and even to do an exercise (running) during night before sleeping. This can be viewed that adolescent influenced by their peers as one of social development task^[14]. Peers provide strong support in adolescents and establish a pattern of behavior. It means ability to control the behavior of adolescent in particular include sleep hygiene behavior is strong effect by peer. Li *et al.* year 2010 also found that physiological stimulation before bedtime was one of many risk factors associated with shorter sleep duration^[15].

The emotional aspects of adolescents in this study most with a good category. One of adolescent characteristic is having emotional stability^[14]. This means that students in this study have good self-control on his emotional state. So it does not interfere with the emotional aspects of the quality and quantity of sleep adolescents Balinese. Reviewed from the sleep environment aspects, most adolescent Balinese often asleep while listening to loud music. Students in this study claimed that listening to music does not interfere with sleep, but help them to get to sleep easily. The effectiveness of listening to loud music to improving the quality and quantity of sleep adolescents have not found. However, studies of Harmat *et al.* 2008 revealed that 45 minutes of classical music at bedtime effectively reduced sleep problems in young adults^[16].

From the aspect of nap, Balinese adolescents take a nap on average for 45 minutes - 2 hours. But they said that they take a nap more frequent >1 hr. LeBourgeois *et al.*^[2] recommend avoiding excessive nap, but until now there has been no research that reveals the effect of naps on nocturnal sleep in adolescents. Study of the Vela-Bueno *et al.* year 2008^[17] found that napping for 1 hour for young adults with an irregular pattern of sleep/wake and debt of sleep does not affect the onset of sleep or quality of nighttime sleep.

Sleep stability aspect of Balinese adolescent mostly at less category. Sleep duration of student in this study may be sufficient, but it can occur disturbances in the quality of sleep or changes in sleep schedule on weekends, which are sleep late at night and wake up later in the day than the day school. This is likely related to lifestyle and activity patterns of youth outside of school hours so that the pattern of Balinese adolescent wake/sleep become irregular. Research LeBourgeois *et al.*^[2] in Italian and American adolescents showed that the stability of a regular sleep plays a role in forming a good quality of sleep. Li *et al.*^[15] also revealed that the pattern of sleep/wake irregular is a risk factor for shorter sleep duration and sleepiness during the day.

Lack of sleep hygiene behavior aspect in this study mostly can also be affected by low of parents education (father and mother) in this study which were mostly an elementary education. So that the information that were conveyed from parents about sleeping limited to what their parents know. It will also affect the behavior of the sleep hygiene students.

5 Conclusions

Most of the Balinese adolescents have sleep hygiene with less to moderate category. Poor sleep habits may lead to irritability, impatience which affect individual and those around us.

6 Recommendations

Students are expected to improve good sleep pattern and regular sleep schedule on their daily life. Limiting strenuous activity before sleep may be useful for adolescents to enter sleeping. Parents should control the sleep schedules of students, identify and avoid factors that can interfere with sleeping students. The school should maintain a schedule of counseling related to sleep patterns that have been routinely carried out on students. Community nurses can provide information and health education in particular to the adolescent and families about the importance of maintaining the quality and quantity of sleep for health, growth and development of adolescents.

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