

Research Article

Caffeine in Student Learning Activities

Agussalim^{1*}, Rusli², Ashari Rasjid³, Muhammad Nur⁴, Tiar Erawan⁴, Iwan³, Zaenab⁵

¹Parepare School of Nursing, Makassar Health Polytechnic, Indonesia

²School of Pharmacy, Makassar Health Polytechnic, Indonesia

³Makassar School of Nursing, Makassar Health Polytechnic, Indonesia

⁴School of Physiotherapy, Makassar health Polytechnic, Indonesia

⁵Makassar School of Health Environment, Makassar Health Polytechnic, Indonesia

*Address Correspondence to Agussalim, E-mail: salim170878@gmail.com

Received: 02 October 2023; Manuscript No: JDAR-23-116033 **Editor assigned:** 04 October 2023; PreQC No: JDAR-23-116033 (PQ); **Reviewed:** 18 October 2023; QC No: JDAR-23-116033; **Revised:** 23 October 2023; Manuscript No: JDAR-23-116033 (R); **Published:** 30 October 2023; **DOI:** 10.4303/JDAR/236264

Copyright © 2023 Agussalim, et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Caffeine is drug addictive without colored and taste found in our food and drink consumption. It also found in a number drugs as stimulant heart and also as diuretic light for increasing urine production. Food and drink such as coffee, tea, chocolate, and cola all contain caffeine. It can become reason quality sleep and less sleep as for impact caused by quality of sleep. This study aims to know connection between habit consumption drink caffeinated (coffee) with quality sleeping at student's compound. This study use method analytic with approach Cross Sectionals. Study This done on the month June 2022–July 2022. Obtained samples as much as 100 participants. Study is using technique Purposive Sampling and tools used for obtaining data is questionnaire. Study This use Test-Square with mark significance $\alpha=0.05$. Study results connection between habit consumption drink caffeinated (coffee) with quality sleep student with P value= $0.00 < \alpha=0.05$. There is between habit consumption drink caffeinated (coffee) with quality Sleep of the students. It is recommended that students regulate the consumption of caffeinated beverages so that can minimize impact from habit that's one of them quality disturbance of sleep.

Keywords: Caffeine; Activity; Learning; Students; Sleep quality

Introduction

Coffee is a drink that is loved by many people, both men and women. Everyone in this world doesn't know coffee. Coffee is not something foreign, this drink is very easy and often found in everyday life. Coffee is a type of drink that comes from the processing and extraction of coffee plant seeds. The word coffee itself comes from the Arabic word 'qahwah' which means strength, because coffee was originally used as an energy drink.

Caffeine or more its popular Caffeine is an alkaloid compound Xanthine is in the form of crystals and has a bitter taste which works as a medicine stimulant psychoactive and mild diuretic. Caffeine was discovered by a German

chemist, Friedrich Ferdinand Runge, in 1819. He coined the term "kaffein" to refer to the chemical compounds in coffee. Caffeine is also called guaranine when it is found in guarana, mateina when it is found in mate, and theine when it is found in tea. All these terms equally refer to compounds the same chemistry [1].

Caffeine is drug colorless and tasteless addictive found in many of the foods and drinks we consume, also found in a number of drugs as a cardiac stimulant and also as a mild diuretic to increase urine production. Foods and drinks such as coffee, tea, chocolate and cola all contain caffeine which can be a cause of sleep quality and sleep deprivation as for the impact caused by sleep quality.

As drug addictive, caffeine stimulates the brain in much the same way as amphetamine, cocaine, and heroin. Even though the overall effects of caffeine are milder than those of other drugs, it still manipulates the same brain pathways that make caffeine addictive. If you are one of those people who feel like you can't function without coffee or other stimulants, they contain caffeine [2].

Consumption caffeine has associated with sleep disturbances, because effect physiological. Quality Sleep is satisfaction someone against sleep, so that a person does not show feelings of fatigue, easily aroused and restless, lethargic and apathetic, black around the eyes, swollen eyelids, red conjunctiva, sore eyes, fragmented attention, headaches and frequent yawning or drowsiness.

Caffeine found in a manner naturally in foodstuffs such as seeds coffee, leaves tea, fruit cola, guarana, and mate. In plants, it acts as a natural pesticide that paralyzes and

kills certain insects that eat these plants. It is commonly consumed by humans by extracting it from coffee beans and leaves tea. Caffeine is drug stimulant central nervous system in humans and can expel drowsiness temporarily. Beverages that contain caffeine, such as coffee, tea, and soft drinks, are very popular. Caffeine is the most widely consumed psychoactive substance in the world. Unlike other psychoactive substances, caffeine is legal and unregulated in most jurisdictions around the world. In North America, 90% of adults consume caffeine daily.

Sleep is a state of relative unconsciousness which is not a state of complete serenity without activity is a series of repeated cycles. The level of consciousness fluctuates during the different stages of sleep. Physiology of sleep=Sleep is a cyclical physiological process that alternates with longer periods of wakefulness. Sleep pattern varied clearly in society the general standard of 8 hours every night there is no specific formula. It is important for everyone to follow a certain pattern of rest to maintain health/physical fitness. The need for sleep hours for each age: Infants (13 hours-16 hours), Children (8 hours-12 hours), Adults (6 hours-9 hours), Age continued (5 hours-8 hours).

Impact Quality Sleep British researchers discovered how sleep patterns affect the death rates of more than 10,000 British civil servants over 2 decades. Based on the results of another study published in 2007, people who sleep less than 5 hours-7 hours a day increase their risk of death due to various factors. Even sleep deprivation can double the risk of death consequence disease cardiovascular.

According to According to a Royal Society for Public Health (RSPH) survey, the average British adult sleeps less than an hour, and doesn't sleep on Saturday nights. This poll involving 2,000 adults, published by the Royal Society for Public Health found the average sleep time is 6.8 hours, compared to the human need i.e., 7.7 hours.

Report the showing the amount of sleep aged 18 years-64 years should be for 7 hours to 9 hours a day. Whereas for ages 1 year-2 years as much as 11 hours-14 hours a day, and ages 65 and over as much as 7 hours-8 hours a day. Good quality sleep is more important than the amount of sleep you get and it helps to maintain it you feel healthy.

Based on results Research by the National Sleep Foundation in America (International) in 2006, more than 36% of young adults aged 18 years-29 years reported having difficulty getting up early compared to 20% at the age of 30 years-64 years and 9% over the age of 64 years. In addition, almost a quarter of young adults (22%) are often late for class or work because they have difficulty getting out of bed compared to 11% of workers aged 30 years-64 years and 5% over the age of 64 years and 4% of young adults complain of drowsiness when doing activities for at least 2 days a week or more. In addition, in 2011, a study was also conducted involving 1,508 respondents with the result that 51% of respondents who experienced sleep disturbances were respondents aged 19 years-29 years.

Besides that's a complaint Sleep difficulty are more

frequently reported than other sleep-related complaints. Estimates of its prevalence in adults vary from 15% to 40% and increase in the elderly. Whereas in children aged 3 years as many as 14% have difficulty sleeping and 50%-80% of children experience learning disorders due to poor sleep quality.

According to Potter et al., (2006) inadequate sleep and poor sleep quality can cause disturbances in a person's physiological and psychological balance. Sleep disorders are often found in children and adolescents, disorders of neurological development and psychiatric development. Sleep quality can also be influenced by various things in the surrounding environment. Sensory stimuli from the environment such as sound, light and movement can affect the initiation and quality of sleep. Lack of quantity and quality of sleep-in adolescents can result in excessive sleepiness during the day and decreased attention levels during the day and decreased attention levels during the day. Disturbances in sleep patterns in the form of excessive sleep patterns can have negative effects on performance at school, cognitive and mood as well bother academic teenager.

Study about quality sleep by Nashori et al., (2004) with the title "The relationship between sleep quality and student self-control" in 126 psychology students at the Islamic University of Indonesia showed that the contribution of sleep quality to self-control was 30.8%. The high self-quality is influenced by the quality of students' sleep which is classified as high (55.5%) and moderate (43.7%). Someone who sleeps enough time with adequate sleep quality will be a person who is in a positive mood, alert, and has the correct perception of various stimuli, so that he does not get stuck in bad behavior negative and destructive.

According to WHO (World Health Organization) data in 1993, approximately 18% of the world's population had experienced sleep difficulties. This sleep disorder is called Sleep Quality. According to the National Sleep Foundation in Indonesia, the prevalence of sleep quality sufferers reaches 70%, at least once a week in 30 million people have difficulty sleeping every night.

Based on approx. a quarter of the adult population has experienced sleep problems and 6% to 10% are estimated to have impaired sleep quality. The prevalence of insomnia in Indonesia is around 10%. This means that approximately 28 million out of a total of 238 million Indonesians suffer from quality sleep [3].

Method of Research

Type study observational with an analytical approach. The design used is a Cross Sectional Study design. Cross Sectional Study is a research design that studies the dynamics of the correlation and the relationship between the independent variables and the dependent variable at the same time. Technique withdrawal sample used in this study is purposive sampling, namely sampling based on certain criteria or certain considerations by the researcher. The sample size depends on the number of respondents

available at the time of the study and fulfills the inclusion and exclusion requirements. To meet the representative requirements, the number of respondents as many as 100 people with a total sampling.

Data collection tool was designed by the researcher according to the conceptual framework that has been created. The instrument used is a questionnaire sheet. The drinking habit questionnaire uses a closed-ended question form. Totaling 1 question item Research instrument on sleep quality is measured using the Pittsburgh Sleep Quality Index (PSQI). This questionnaire consists of 18 questions divided into 7 components of sleep quality, sleep disturbance, sleep latency, sleep duration, habitual sleep efficiency, daytime sleep disturbance and dysfunction.

Data Processing is done in a manner where to edit after the data is collected so done inspection completeness of data, continuity and uniformity of data. Furthermore, is coding that is done for make it easy data processing i.e., provide symbols from every answer respondent Then done tabulation namely; group data in table form i.e., connection between independent and dependent variables.

Data analysis was performed in a manner Univariate that is done to variables from results research. By and large in analysis This produce distribution and presentation from each variable studied as well as analysis bivariate were done to the 2 independent variables and the dependent variable with using the Chi square test with level significance (α) 0.05 with use computer data processing program services.

In study this researcher emphasizes problem ethics which include:

- Informed consent is form agreement between researchers and respondents' study with give sheet approval, the informed consent given before study done with give sheet agreement for become respondent. The purpose of informed consent is for the subjects understand intents and purposes research, find out impact. If subject ready, then they must sign sheet agreement. If the respondent no ready, then researcher emotion honor right patients [4].
- Anonymity For guard secrecy, researcher No. will include Name complete respondent but only will include initial respondent.
- Confidentiality i.e., researcher ensure secrecy identity and information obtained from respondent. All file that includes subject when already no used will annihilated.

Results

After done data collection, researcher do edit for inspect data completeness. Furthermore, researcher carries out the process of coding, scoring, data entry, processing, then researcher do data tabulation i.e., group data in form target table. There is connection between variable independent and dependent with using statistical tests Chi-Square has that level meaning $p < \alpha = 0.05$. After That researcher do Cleaning i.e., checking return the data that has been entered is error or not (Tables 1-8).

Table 1: Characteristics of respondents by age

S.No	Age	n	Percentage (%)
1	<19	19	19
2	20	33	33
3	21	27	27
4	22	13	13
5	>23	8	8
Total		100	100
Source: Primary data 2022			
Based on table from 100 students, the highest age group was 20 years old with 33 people (33%) and the lowest was >23 years old with 8 people (8.0%)			

Table 2: Characteristics respondents based on religion

S.No	Religion	n	Percentage (%)
1	Islam	94	94
2	Christian	6	6
Total		100	1
Primary data source, 2022			
Based on table characteristics of religious respondents the most is Islam 94 people (94.0%), Christian 6 people (6.0%)			

Table 3: Characteristics of respondents by tribe

S.No	Ethnic group	n	Percentage (%)
1	Bugis	35	35
2	Macassar	34	34
3	Maluku	24	24
4	Flores	7	7
Total		100	100
Source: Primary data 2022			
Based on distribution table from 100 students, the highest ethnicity is the Bugis tribe with 35 people (35.0%) and the lowest is the Flores tribe with 7 people (7.0%)			

Table 4: Characteristics respondents based on the student forces

S.No	Force	n	Percentage (%)
1	2015	35	35
2	2014	24	24
3	2013	17	17
4	2012	24	24
Total		100	100
Primary data source, 2022			
Based on distribution table characteristics of respondent a class of 2015 as many as 35 people (35.0%), batch 2014 as much 24 people (24.0%), batch 2013 as many as 17 people (17.0), and the 2012 class as many as 24 people (24.0%)			

Table 5: Characteristics of respondents based on hours of sleep

S.No	Sleep hours	n	Percentage (%)
1	4-5	17	17
2	6-7	51	51
3	8-9	27	27
4	10-11	5	5
Total		100	100
Source: Primary data 2022			
Based on distribution table from 100 students, the highest sleeping hour group was 6-7 h of sleep for 51 people (51.0%) and the lowest was 10-11 h of sleep for 5 people (5.0%)			

Table 6: Distribution of respondents based on consumption habits of caffeinated beverages (coffee)

Consumption of caffeine	n	Percentage (%)
Just 1-3 glasses	64	64
Excess >3 glasses	36	36
Total	100	100
Source: Primary data 2022		
Based on distribution table 100 people who consume caffeinated beverages there is 64 people (64.0%) consumed enough and 36 people (36.0%) consumed excess caffeinated drinks		

Table 7: Distribution of respondents based on sleep

Sleep quality	n	Percentage (%)
Good	57	57.0
Bad	43	43.0
Total	100	100
Source: Primary data 2022		
Based on distribution table 100 people who have good sleep quality there is 57 people (57.0%) and 43 people (43.0%) had poor sleep quality		

Table 8: Connection between caffeinated beverage consumption habits (coffee) with quality sleep

Caffeine consumption habits	Quality Sleep						P value
	ok		Bad		Total		
	N	%	n	%	n	%	
Enough	50	87,7	14	32,6	64	100	Total
Excess	7	12,3	29	67,4	36	100	Total
Total	57	57	43	43	100	100	Total
Source: Primary data 2022							
Based on distribution table there is connection between consumption of caffeinated drinks and quality Sleep student, After statistical test was carried out Chi Square obtained results P value=0.000							

Discussion

The habit of consuming caffeinated drinks (coffee) is normal and commonplace in the general public, especially men. Habits like this are very easy for us to find both among parents, teenagers, and children. However, we need to know that consuming caffeinated drinks (coffee) should be regulated and limited. People should consume caffeinated drinks (coffee) in a regulated amount in a day.

Consuming caffeinated drinks is a lifestyle that is closely attached to most Indonesian people, this is why some people even make it a routine and obligation in the morning, even in the afternoon and at night. However, there are important things that are later overlooked by the wider community about the effects of consuming coffee in irregular or excessive doses which can have negative effects on health, both directly and indirectly.

Sleep quality among young people is very difficult to achieve. This is caused by various factors, one of which is due to the habit of consuming caffeinated drinks (coffee). However, good sleep quality can still be achieved by young people if they are able to adjust their habitual patterns of consuming caffeinated drinks, such as consuming enough coffee. Thus good sleep quality can still be achieved.

Poor sleep quality is caused by various factors, including the effects of caffeinated drinks (coffee). The habit of consuming coffee is indeed one of the factors of poor sleep quality, either directly or indirectly. However, in this study other factors were also found that caused poor sleep quality, namely the result of most students being respondents while the process of preparing the final assignment, namely the thesis, so this also made students stressed resulting in poor sleep quality.

Based on research that has done, show that Caffeine

consumption habits are very influential quality Sleep student, where students who have a habit of consuming caffeinated drinks enough as many as 64 people, there are 50 people (87.7%) have quality sleep well. While students who have the habit of consuming caffeinated drinks excess of 36 people, there are 7 people (12.3) who have quality sleep ok. Based on the results of research using statistical tests Chi Square obtained results P value=0.000, so that There is connection meaning between habit of consuming caffeinated drinks quality sleep.

Researchers assume that when a person consumes more than 3 glasses of caffeinated drinks (coffee), it will greatly affect the quality of sleep. In the results of interviews conducted several respondents said that consuming coffee was very influential at night when the respondents were doing their assignments, they said they really needed coffee so they wouldn't get sleepy when doing work at night.

Based on the results of this study, it was found that students who consumed more than 3 cups of caffeinated drinks (coffee) experienced sleep quality at night when they replaced sleep during the day. The caffeine content in coffee is able to stimulate the human central nervous system, which is often used to fight drowsiness attack and increase stamina to work at night. Caffeine is a stimulant of the central nervous system and metabolism, used well for treatment in reducing physical fatigue and can also increase the level of alertness so that sleepiness can be suppressed. Caffeine also stimulates the central nervous system by increasing the level of alertness, so that thoughts are clearer and focused and body coordination becomes better [5]. Furthermore, Caffeine is compound chemical found in a manner natural inside food for example coffee beans, tea, seeds coconut, kola fruit (colanitide) guarana, and mate.

Tea is source other caffeine, and contains half from caffeine contained in coffee. A number of type tea that is tea black contain more lots caffeine compared to type another tea. Tea contains A little amount theobromine and a little higher theophylline from coffee. Caffeine is also material used for potion nonalcoholic drink like cola, which was made from kola nuts. Soft drinks especially consist from 10 milligrams-50 milligrams caffeine. Chocolate made of from cocoa contain a little caffeine like. Effect weak stimulant 36 of chocolate can is combination from theobromine and theophylline as caffeine [6,7].

A researcher from Canada revealed that the habit of drinking coffee while working at night is not a good habit, the habit of drinking coffee will disrupt the quality of sleep along with increasing age sleep disturbances caused by caffeine will get worse, this statement has been proven through research that published by the Journal Sleep Medicine, because of that everyone who is still young should start reducing the amount of coffee they consume, especially for those who have to work at night. Reducing coffee intake is the best way to improve sleep quality in people aged 19 years-23 years so that quality sleep for 8 hours/day is one of the steps to a healthy life.

This habit is controversial with many pros and cons discussed about the quality of sleep. According to research by the American Academy of sleep medicine presented in June at the LEEP Annual Meeting of the Associated Professional Sleep Societies, caffeine has a negative impact on sleep patterns and academic achievement in school students. This research was conducted to test the impact of caffeine, especially among students who often consume caffeine (coffee) with the aim of increasing alertness and reducing fatigue for studying in students at night. According to Purdiani et al., (2014) caffeine consumption has also been shown to have negative impact on consumer sleep patterns and cause drowsiness [8,9].

Conclusion

Indeed, the quality of sleep among young subjects is very difficult to achieve. This is caused by various factors, one of which is due to the habit of consuming caffeinated drinks (coffee). According to researcher if consume more coffee from 2 to 3 glass will bother quality Sleep student. However, good sleep quality can still be achieved by young people if they are able to adjust their habitual patterns of consuming caffeinated drinks, such as consuming enough coffee. Thus good sleep quality can still be achieved.

Study limitation

The limitations on this research that is researcher conducted

approach with method more deep interviews so that the information obtained still limited. Method more research appropriate used in this study. That is combined between method interview and award sheet questionnaire so that the information obtained more.

Funding

There is no funding in this research.

Acknowledgement

We would like to thank to the Ministry of Health Indonesian Republic as the regulation to allow us conducting research based on our home based in Health Polytechnic. In other side, we would like to thank to the Director, and all vice directors of Makassar Health polytechnic. Many thanks to all students who become our respondents in our research.

Conflict of Interest

Authors have no conflict of interest to declare.

References

1. Institute of Medicine (US) Committee on Military Nutrition Research, Pharmacology of caffeine, National Academies Press (US), 2021.
2. H. Elizabeth, What to know about caffeine use, 2021.
3. P.A. Veronica, A. Palamba, Syamsir, Abidin, Saleng, et al. The Relationship between beverage consumption habits caffeinated (coffee) with quality sleep of undergraduate nursing students, *Nov Res Sci*, 5(2021).
4. L.M. Juliano, R.R. Griffiths, A critical review of caffeine withdrawal: Empirical validation of symptoms and signs, incidence, severity, and associated features, *Psychopharmacology (Berl)*, 176(2004):1-29.
5. S.B. Karch, Karch's pathology of drug abuse, 4th Edition, Boca Raton: CRC Press, 2009:229-230.
6. N. Jannah, The Relationship between coffee drinking and smoking habits with blood pressure values of adult men in coffee shops in Banda Aceh City, *J Nurs Sci*, 2(2013):122-32.
7. S.D.A. Mekar, Qualitative and quantitative research methodology in the health sector, Yogyakarta: Nuha Medika, 2013.
8. B.D. Nurdiana, The effect of caffeine on the sleep quality of students at the University of North Sumatra, *FK-USU*, 1(2013).
9. L. Susanti, Factors associated with the incidence of insomnia in the neurology polyclinic at DR.M.Djamil Hospital, Padang, *Andalas Health Journal*, 4(2015).