



**THE RELATIONSHIP OF STRESS WITH THE BEHAVIOR OF CONSUMING
CAFFEINATED FOOD AND BEVERAGES IN NURSING STUDENTS AT
BANJARMASIN UNIVERSITY**

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Abstract

Academic demands and assignments can be one of the etiologies of stress which has an impact on physical and psychological health so that it causes unfavorable behavior, one of which is towards consuming food and drinks that contain caffeine. This study aims to determine the relationship between stress and the behavior of consuming caffeinated food and drinks in female students at the University of Banjarmasin. This type of research is descriptive analytic with cross sectional design. All populations in this study were used as research samples, namely final year female students and 171 female students undergoing professional nursing education. Test analysis using Spearman rank test. The results showed that the p value was $0.000 < 0.05$ so that there was a relationship between stress and the behavior of consuming caffeinated food and drinks in female students with. The level of stress experienced by a person is one of the things that contributes to behavior in consuming various types of food and drinks, including those containing caffeine

Keywords: Stress, Behavior, Consumption, Caffeinated Foods And Drinks

PENDAHULUAN

A woman is someone who has many tasks and roles in her life that must be completed properly, where these tasks and roles sometimes must be completed at the same time. In response to this, a woman must be able to do self-management and no less important is to have extensive knowledge by getting as much education as possible. Education is very important for women because in addition to taking care of the household, women can be someone who is important in building intelligent and quality future generations. Women with higher education will certainly have broad insights, open-mindedness and brilliant careers so that starting at a young age education becomes one of the most important things to pay attention to in order to prepare for a future career.

Girls who are teenagers are known as young women with an age range of early adolescents 12-15 years, mid-teens 15-18 years and late adolescents 19-25 years (Silvia, Nasrul and Ilmiawati, 2019; Bulu, Maemunah and Sulasmini, 2019). Young women who are still

undergoing an educational process like female students will have many tasks and demands that come from academics. The tight academic schedule coupled with the many other activities causes female students to have to do more activities, which can cause fatigue in both physical and psychological aspects. Hammad, Rizani and Agisti, 2018; Hidayat, Ristyowati and Putro (2020) describe physical fatigue as a condition in which the body experiences a decrease in physical performance and difficulties in carrying out subsequent physical activities due to a lack of energy reserves, which is characterized by headaches, fever, back pain, tension in the neck and shoulder muscles. , frequent colds, difficulty sleeping, to chronic fatigue. Psychological fatigue is fatigue caused by the psychological factor itself so that it can affect the mental which is characterized by a state of stress to a state of psychiatric disorders such as depression.

Sutarjana (2021) states that stress is a disturbance to a person's mind and body caused by changes in the environment or personal image of the environment. Stress is not an easy



thing to avoid and will be experienced by everyone because stress is a universal phenomenon that occurs in everyday life so that it will continue to revolve in everyone's life cycle (Hasnawati, Usman and Umar, 2021). The Mental Health Foundation (MHF 2018), describes the prevalence of stress events in the world, which is 74%, then in 2019 the World Health Organization (WHO) stated that the total world population experiencing stress and depression is 264 million people. Basic Health Research (RISKESDAS) presents data that in 2013 there were 1.7% of Indonesia's population aged 15 years and over where one of the groups, namely female students, indicated experiencing mental emotional disorders (stress), where this incident increased sharply in 2018 to 7%.

Khoirunisa and Dwiyantri (2021) in their study described that students who are studying in the final semester mostly experience stress at a moderate level, where one of the factors that causes it is the heavy academic load demands that must be completed within a predetermined time limit. The study above is supported by B and Hamzah (2020), that most health students experience moderate levels of stress due to the demands of academic work that must be completed and tend to experience physical and emotional (mental) fatigue.

There are many ways that can be used to reduce fatigue in the physical and psychological aspects (stress), one of which is often done is to consume foods and drinks that contain caffeine. Caffeine is a psychoactive substance that functions to stimulate the human nervous center so that consuming this substance makes the nervous system work sharper and stronger. Caffeine is contained in many familiar foods and drinks consumed daily by Indonesian people. One age group that often consumes it is teenagers who are still undergoing an educational process such as college students. Caffeine is able to make a person awake and even increase concentration in the short term, which is the factor that causes food and drinks that contain caffeine to be the choice to help maintain concentration when required to complete academic assignments.

Soesanto (2020), describes that caffeine will be safe to have a calming effect, increase energy and reduce stress if consumed within normal limits, namely 50-200 mg or the equivalent of three cups of coffee per day, but if consumed exceeds the limit of 500-600 mg per day or the equivalent of 5- 6 cups of coffee can cause certain health problems, such as restless thoughts, increased heart rate, increased stress conditions and so on. Excessive caffeine consumption will trigger neurological and endocrinological pathways which result in inhibition of the release of other neuroactive substances such as dopamine, adenosine and cortisol which play an important role in regulating mental function, emotional response (mood), behavior involving increased motivation, regulation of physical function (slowing down conduction heart electricity and normalizing heart rhythm) as well as increasing cognitive function (attention and concentration) so that by inhibiting the release of the other neuroactive substances mentioned above, one of them has an impact on increasing stress suffered by a person (Karayigit et al., 2021).

Seiring perkembangan zaman, kafein mulai mudah didapat dalam berbagai makanan dan minuman yang dijual bebas. Salah satunya adalah minuman kopi yang menjadi minuman terfavorit banyak orang sehingga saat ini banyak kedai kopi maupun kopi instan lainnya yang dijual dengan berbagai rasa yang menarik, sehingga fenomena ini menjadi salah satu penyebab bertambah banyaknya peminat minuman yang mengandung kafein. *International Coffe Organization* (ICO) menguraikan bahwa konsumsi penduduk dunia terhadap kopi terus mengalami peningkatan dari tahun ke tahun. Hal ini dibuktikan dengan data yang dikeluarkan pada tahun 2017-2018 yaitu sebesar 9,7 ton kopi dikonsumsi di seluruh dunia (Maulina, Sayuti dan Said, 2020). ICO juga mengungkapkan bahwa pada tahun 2018-2020 penduduk Indonesia mengalami peningkatan yang sangat pesat dalam pengkonsumsian kopi yaitu sebesar 4,9 juta kemasan yang menjadikan Indonesia berada pada urutan ke dua sebagai negara dengan

konsumsi kopi terbesar di dunia setelah Brazil (Hasby, Armyuda dan Haq, 2020).

Arslan and Aydemir (2021) put forward several research results regarding caffeine consumption among university students, namely when caffeine consumption increases or is consumed in excessive levels, it causes an increase in the level of stress suffered and even risks leading to depression. In line with the description above, Al Ateeq et al., (2021) also revealed that if a person consumes too much caffeine, it will affect the severity of stress, where a person with a high level of caffeine consumption will also experience increased stress. Contrary to Arslan and Aydemir (2021), Liunima, Sutriningsih and Masluhiya (2017) stated the results of their research that the higher the dose of caffeine consumed, the lower the level of stress felt in young adults. Based on some of the research results above, it can be concluded that consumption of caffeine in low doses will have positive effects on the body, one of which can reduce stress and fatigue, but if caffeine is consumed in high doses, it will have negative effects such as increased levels of anxiety, restlessness, difficulty getting to sleep (insomnia) resulting in increased severity and increased stress symptoms.

Preliminary studies conducted related to stress events in 10 final semester female students using the Perceived Stress Scale (PSS) questionnaire showed that 70% of female students experienced severe levels of stress, where when experiencing stress, all of them behaved to consume food and drinks that contain caffeine.

METHODS

This type of analytic descriptive research with cross sectional design. The sampling technique in this study used a total sampling technique so that all populations were used as research samples, namely undergraduate nursing students in the VIII semester, regular professions and sex-transfer professions with a total of 171 female students. The instrument used is a questionnaire which is divided into 2 parts, namely the Perceived Stress Scale (PSS) to measure stress levels and a questionnaire to

determine the behavior of consuming caffeinated food and drinks and food recall to analyze consumption patterns and food ingredients consumed by a person every day. Analysis of research data using the Spearman rank test.

RESULTS AND DISCUSSION

The results of research on the relationship between stress and the behavior of consuming caffeinated food and drinks in nursing students can be seen in the following table :

a. Characteristics of female students

Characteristics of female students in this study include age, level of education and age of menarche described in the following table:

Table 1. Characteristics of Respondents Based on Age, Level of Education and Age of Menarche

Karakteristik	Frequency (F)	Percentage (%)
Ages		
20 tahun	4	2.3
21 tahun	38	22.2
22 tahun	47	27.5
23 tahun	41	24.0
24 tahun	17	10.0
25 tahun	19	11.1
26 tahun	5	2.9
Total	171	100.0
Tingkatan Pendidikan		
Semester VIII	68	39.8
Ners Reg	67	39.2
Ners AJ	36	21.0
Total	171	100.0
Usia Menarche		
10 tahun	2	1.2
11 tahun	6	3.5
12 tahun	92	53.8
13 tahun	48	28.1
14 tahun	17	9.9
15 tahun	6	3.5
Total	171	100.0

Table 1 shows that out of 171 female students, 47 people (27.5%) were 22 years old, 68 people (39.8%) were still studying in semester VIII of higher education and 92 people (53.8%) experienced menarche at the age of 12 years.

b. Student Stress Levels

Stress levels are divided into 3 levels, namely mild stress levels, moderate stress levels and severe stress levels, which can be seen in table 2.

**Table 2. Tingkatan Stres**

No	Tingkat Stres	Frekuensi	Persentasi
1	Stres Ringan	4	2.3
2	Stres Sedang	43	25.1
3	Stres Berat	124	72.6
Jumlah		171	100

Table 2 shows that of the 171 female students, it was found that the majority, namely 124 people (72.6%) experienced severe stress.

c. Perilaku Mengkonsumsi Makanan dan Minuman Berkafein

The behavior of the respondents in the study was categorized into two, namely good behavior and bad behavior

Table 3. Perilaku Mengkonsumsi Makanan dan Minuman Berkafein

No	Perilaku Konsumsi	Frekuensi	Persentasi
1	Baik	35	20.5
2	Kurang Baik	136	79.5
Jumlah		171	100

Table 3 shows that out of 171 female students, it was found that the majority of 136 people (79.5%) had poor behavior of consuming caffeinated food and drinks.

d. Relationship of Stress with Caffeinated Beverage Consuming Behavior

Table 4. Relationship of Stress with Caffeinated Food and Beverage Consuming Behavior

Tingkat Stres	Perilaku Mengkonsumsi Kafein				Σ	%	Sig.	rs
	Baik		Kurang Baik					
	F	%	F	%				
Ringan	4	2.3	0	0	4	2.3		
Sedang	29	17.0	14	8.2	43	25.2		
Berat	2	1.2	122	71.3	124	72.5		
Total	35	20.5%	136	79.5%	171	100	0.00	0.767

Table 4 showed that out of 171 female students, it was found that the majority, namely 122 people (71.3%) experienced severe levels of stress with unfavorable behavior in terms of consuming caffeinated food and drinks. The statistical test results obtained p value = 0.000 which is less than α 0.05 so it can be concluded that there is a significant relationship between stress and the behavior of consuming caffeinated food and drinks. The relationship of these two variables shows a positive correlation direction with the Spearman rank value of 0.767

which means that the relationship between the two variables is very strong so that it can be interpreted that the heavier a person's stress level, the worse the behavior of consuming caffeinated food and drinks.

Discussions

a. Respondent's Stress Level

The study is carried out on final semester students and those who are currently pursuing further education in the Nurses Program where the academic tasks and demands will be greater, besides that the activities carried out will also be more numerous. The results of the study show that female students experience stress with symptoms that are felt as in the last 1 month often feel sad or disturbed because of unexpected problems, feel unable to control important things in life such as not being able to manage time, often feel anxious and depressed, feeling unsure of one's own ability to handle personal problems, often feeling that things are not happening according to one's will, often unable to finish things that need to be done, easily offended, feeling like giving up easily and moody, one of which is caused by not being able to complete academic assignments, often angry because things are happening out of control, feel a lot of difficulties have piled up so they feel unable to overcome them. The above symptoms were obtained by using a structured questionnaire Perceived Stress Scale (PSS) and it can be concluded that most of the female students who were respondents experienced severe levels of stress.

Basically stress is one of the body's ways to protect itself from danger, where this situation will keep a person focused, active and always alert so that stressful conditions will be needed by someone at a level that does not cause physiological disturbances. Stress is also known as a body reaction or response that is shown in a person's physiological, psychological and behavioral aspects due to stressors both internal and external, such as facing a situation and condition that is dangerous, difficult or there is a change in the surrounding environment. The stressors above are at risk of affecting all parts of a person's life



and can cause mental stress, changes in behavior and problems in interacting with friends, family and other people. (Permatasari, Suyami dan Tyas, 2021).

Stress is often experienced by someone in everyday life with various levels, ranging from mild stress to severe stress to panic. If only a mild level of stress is experienced, then this condition will not cause damage to the physiological aspects, because a mild level of stress is generally felt by everyone, such as forgetting, falling asleep, getting criticized by others, experiencing traffic jams and so on. This mild level of stress will help a person to be more alert and will look for solutions or ways out of the situations and conditions they are facing. Conversely, if a person experiences severe levels of stress, it will affect the brain structure which is at risk of triggering an imbalance of brain matter and causing the brain's mechanism to calm down to be disrupted. The thing that is very detrimental to conditions of severe stress is that when a person is very used to dealing with this level of stress, it will cause emotional conditions, thoughts and behavior to change unknowingly so that if it is not treated immediately it will be at risk of psychiatric disorders such as depression, bipolar disorder, a severe anxiety disorder and can trigger post traumatic stress disorder (PTSD), especially in women.

Women are more at risk and more often experience stress with more severe levels when compared to men, because anatomically women have a larger limbic system that influences emotions and motivation that allows women to act based on emotions. In addition, women often think about things excessively and easily worry about something that may not necessarily happen, which makes them more at risk of experiencing stress (Harahap, 2019). Certain situations experienced by women are also possible triggers for the increasing stress experienced, including multiple tasks and roles, burdens and demands of life. In line with the description above, in this study it was found that the high level of stress that occurs in female students is due to the large number of assignments that must be completed within a

time limit and the amount of academic demands in order to complete education according to the target, coupled with increased activity to complete these tasks and demands. thus causing physical and psychological fatigue. Physical fatigue is characterized by complaints of headaches, disturbed sleep patterns resulting in a sick state, while psychological fatigue is felt as it is very difficult to endure activities, activities that used to be fun and easy to complete become boring and more difficult, reduced ability to respond to something in an adequate way, decreased enthusiasm, motivation, concentration and memory, often feel anxiety that cannot be explained what causes it.

Ambarwati, Pinilih and Astuti (2018), in her study described the stress experienced by female students while undergoing the educational process which had many negative impacts and triggered memory disturbances, impaired concentration, decreased ability to solve problems and decreased academic ability which affected the achievement index. A similar statement was made by Mantolas, Nurwela and Gerontini (2019), namely that as the number of semesters that female students go through increases, it will be directly proportional to the level of stress experienced. This stress often has an impact on various aspects, namely physical, psychological, social and behavioral aspects which will cause the inability to carry out routine activities, feeling bored, losing enthusiasm, decreased ability to remember and concentrate and there is a possibility of collapse or fainting due to physical fatigue. The above is in line with the research results of Ishmah Rosyidah et al., (2020) which states that stress is a condition that often occurs in everyday life that cannot be avoided and is often experienced by a person. One of the causes of the increasing severity of stress experienced by female students is high academic assignments and demands, where students are under pressure caused by academic stressors related to their duties and demands in undergoing education in tertiary institutions.



b. Behavior Consuming Caffeinated Foods and Beverages

This study showed that almost all of the female students who were respondents had unfavorable behavior in terms of consuming foods and drinks that contained caffeine. Behavior is known as a form of reaction or a person's response to a stimulus or to the environment so that in this case behavior is a process of interaction between a person and their environment. Behavior can also be described in the form of activities carried out by someone who can be seen directly or indirectly. There are many kinds of causes for a person's behavior towards a stimulus or stimulus, so that it can also be said that behavior is caused by a person's activity which begins because of a stimulus or stimulus, then comes into contact with the individual himself until a behavior occurs..

Behavior that can be seen directly from a person includes behavior in consuming a type of food or drink which is generally classified as good behavior when consuming food and drink according to the recommended normal consumption rules or in accordance with the nutritional adequacy rate, paying attention to the quality and quantity of food and drink based on balanced nutrition, while behavior is not good if it is not in accordance with the things described above. Food and drink consumption behavior can be described as a form of implementing eating and drinking habits or more simply, is a person's actions towards eating and drinking habits that are influenced by perceptions and knowledge of these foods and drinks and consumption behavior above is one of the important aspects in life because can affect a person's health condition in the long term.

Unhealthy eating and drinking habits such as consuming food and drink with an unbalanced menu, not paying attention to the quality and quantity of food and drink, skipping meals, consuming lots of food and drink that contain preservatives and substances that are detrimental to the body such as caffeine, will be at risk. cause various health problems. Putri, Shaluhayah and Kusumawati (2020), explained

that the consumption of caffeinated foods and drinks is in accordance with normal consumption standards, namely 50-200 mg per day so that there is very minimal risk of causing addiction or disruption to physical and psychological health. According to Harvard Medical School, excessive consumption of caffeine can cause anxiety ranging from nervousness, restlessness, difficulty sleeping, fast heartbeat, gastrointestinal problems.

The results of a study conducted by Prasetio (2020) and Lestari (2021), stated that eating and drinking behavior is a manifestation of the form of implementing one's good or bad eating and drinking habits. One of the eating and drinking behaviors that is not good and is often found is excessive consumption of caffeine which can cause negative effects such as nervousness, anxiety, sleep disturbances, anxiety, stress and worse is depression. Most of the background for someone consuming caffeine is to feel fresher, increase concentration, increase energy and reduce other research conducted by Zuhairiah, Silalahi and Supartiningsih (2021), states that caffeine consumed in excess can cause side effects such as feelings of nervousness, anxiety, tremors, insomnia, hypertension, nausea and seizures. In addition to the negative impact on the physical aspect which is clearly seen and felt when caffeine levels are excessive in the body, one of the effects on the psychological aspect that is sometimes not realized is the increase in the severity of the stress experienced. Aprilia et al., (2018) explained that dependence on high doses of caffeine or more than 200 mg per day can cause changes in physical sensations which are then feared to be the start of intense anxiety attacks. This fear then turns into anxiety and can even trigger a panic attack.

Most people who behave poorly in terms of consuming something are caused by a lack of knowledge and understanding regarding the food and drink that will be consumed properly. This description is in line with the results of this study where almost all female students showed unfavorable behavior towards consuming food and drinks, especially those containing caffeine. A description of the behavior of



female students who are respondents in terms of consuming food and drinks that contain caffeine, specifically coffee/matcha drinks are carried out especially when they are in conditions of high academic demands such as many assignments that must be completed late at night even before dawn, female students will look for ways to physical condition remains fresh, remains concentrated and enthusiastic so consumes 3-4 cups of coffee/matcha drinks per day where if calculated the caffeine content in 1 cup of coffee is around 200-330 mg so that these drinks are consumed in excess of the normal standard limit per day.

In addition to consuming caffeinated drinks as described above, female students who were respondents had the habit of consuming snacks that also contained caffeine such as coffee/chocolate candy, chocolate bars/powder, chocolate wafers, chocolate/coffee ice cream, waffles, chocolate mousse/desert and others. other as attached to the list of caffeinated foods and drinks used as one of the auxiliary instruments in this study to calculate the average amount of caffeine consumed per day. This poor behavior in terms of eating and drinking is compounded by the habit of drinking tea with every breakfast, lunch and evening. Based on the data obtained, it can be concluded that the average amount of caffeine contained in food and drinks consumed is more than 300 mg per day so that the behavior of consuming caffeinated food and drinks carried out by female students is unfavorable behavior..

c. The relationship between stress and the behavior of consuming caffeinated drinks

At present, in everyday life, the habit of consuming caffeinated foods and drinks is something that is commonly done because it has become a lifestyle for people, so people sometimes do not realize that this consumption has exceeded the normal limits of consumption which will later be at risk of causing dependence and even health problems. physical or psychological. Especially when a person is in a stressful situation due to the many roles and tasks that must be completed simultaneously, so physiologically he will try to find ways that are

easy to do, such as consuming food and drinks, one of which is coffee which has been proven to be a mood booster that can increase adrenaline. and body condition when consumed according to normal size. A study published in *Physiology & Behavior* (2017) found that when a person is experiencing a stressful condition given food and drinks that contain caffeine, the result is that the person is able to carry out a heavy task and does not feel too anxious when doing the task..

The female students who were respondents in this study were no exception, where they were in a stressful situation due to the many demands and academic assignments and limited time for completion, causing changes in conditions on the psychological aspect, namely experiencing stress. Stressful conditions will affect the physical and emotional organs so that they become unstable which impact on behavior in dealing with problems. The behavior shown by female students for their current conditions is the behavior of consuming caffeinated foods and drinks such as 3 to 4 cups of coffee/matcha drinks per day where it is known that the caffeine content contained in 1 cup of coffee is 200-330 mg, besides that they also consume coffee candy. /chocolate, chocolate bars/powder, chocolate wafers, chocolate/coffee ice cream, waffles, chocolate mousse/desert and others to maintain physical condition so that they stay fresh and can stay focused on completing their duties as a student.

The behavior mentioned above is behavior that is categorized as unfavorable in terms of food and beverage consumption because the caffeine consumed exceeds the maximum limit of 200 mg or three cups of coffee per day. The amount of caffeine consumed will be increased because apart from drinking coffee, female students also consume other types of food that also contain caffeine. In line with this study, Higbee et al., (2020) in his research found results that a person who consumes caffeinated food and drinks exceeds the normal size, which is more than 200 mg per day, has an impact on increasing the severity of stressful conditions experienced, this is because



caffeine can change some of the effects of hormones in the body such as the hormone adenosine, where caffeine has the effect of inhibiting the absorption of adenosine in the body even though adenosine has a function that calms the body. Disruption of adenosine absorption in the body can trigger sleep disturbances which further exacerbate stressful conditions. This was also reinforced by Choi's study (2020), which stated that respondents who behaved badly in terms of consuming caffeine caused an increase in their level of stress and caffeine could indirectly cause more stress than help get rid of it. Caffeine can manifest in the form of stress, anxiety, or depression depending on how individuals adapt.

Kumaat, Pertiwi and Mawuntu (2021) stated that caffeine is a psychoactive substance that can make a person awake and can even quickly increase concentration. But caffeine also turns out to have an impact on increasing the severity of stress experienced by a person because caffeine can inhibit the absorption of several hormones in the body, including inhibiting the absorption of the hormone adenosine where adenosine has a function that calms the body. Adenosine absorption disorders can exacerbate stress levels, caffeine also temporarily increases the hormone adrenaline in the body which can trigger sleep disturbances. Someone who is not satisfied with good quality and quantity of sleep will have an impact on increasing stress conditions. Likewise with the hormone cortisol where when experiencing stress the body produces a lot of cortisol even though cortisol can make stress worse because it loses control to deal with stress. Consuming caffeine will increase the amount of cortisol in the body which can trigger an increase in stress levels and other health problems. In addition, caffeine will also increase the amount of dopamine in the body which can trigger caffeine addiction so that the more levels of caffeine in the body, the more severe the stress experienced. Another study conducted in 2021 published in *Molecular Psychiatry* found that caffeine drinkers have fewer connections in the emotion-processing

part of the brain and some genes can also be more susceptible to stress caused by the effects of caffeine and some caffeine receptors are very sensitive so a person is more easily experiencing stress even just by drinking tea.

CONCLUSION

The higher the level of stress suffered, the less good a person's behavior is in consuming caffeinated food and drinks.

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