



ORIGINAL ARTICLE

The Effect Breakfast of Energy Intake on Learning Concentration Level Among Islamic Boarding School Students

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Abstract

Concentration was a critical element on learning process, and it is absolutely requires on learning. The factors that influence concentration of learning is hunger. These symptoms are usually experienced by students did not have breakfast before enter the class. This research was to analyze the effect of breakfast energy intake on learning concentration level among Islamic Boarding School students. This study an observational study with a cross-sectional design. The research was conducted in Islamic Boarding schools Darussalam Gontor 2 for Girls in East Java , Mantingan, Indonesia. The research was conducted within three months, calculated December 26th, 2018 to February 28th, 2019. The student's intakes staple food (rice), vegetables and animal protein, vegetables, and snacks. They had seven days menu cycle. Their energy intake is 1194,9 kcal, 43% of respondent got enough calories and 57% had fewer calories. Level of concentration most responden 54,7 % had medium, 42,8 % had good and the rest was bad. There was significant correlation between breakfast and concentration p.value $0,04 < 0,05$. There was the effect of breakfast energy intake on learning concentration level among students islamic boarding school.

Keyword: Adolescents, calorie of breakfast, concentration of learning

Introduction

Success and progress of the countries can be seen from the next generation. They should be good quality in every aspect of life. As the time flies, they should be prepared well before they take a role in the country. In order to prepare future generation, they need proper nutrition because the growth needs energy and good nutrients to achieve a healthy life. Macronutrients and micronutrients requirement will be fulfilled precisely and balanced if someone had a good consumption. In previous resource, Giam (2009) state that food intake must consider gender, age, weight, and physical activity so that both energy intake and expenditure were balanced. Breakfast is one of habit which is important to able to good be healthy and productive. Food intake has a role in creating a good and balanced nutritional status in adolescents. This food intake will be necessary for concentration on learning both academically and non-academically.

Learning is an activity of teaching and studying process and a fundamental element in the implementation of every education, so without learning there will be no education. By learning, students will get knowledge and can develop themselves and from less competent to be more competent. Learning plays a vital role in maintaining life because by learning we know about extensive knowledge and technology. Learning is an activity and the education which need concentration. This concentration is a complicated process to get if several factors can affect during learning those are laziness, hunger, weakness and sleepiness.

Islam commands for every human being to learn and get knowledge. Knowledge is a window of the world and base on the Qur'an, the first verse, Allah commands his people for the first time "iqra" or read it! Allah said in the Quran:

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (1) خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ (2) اقْرَأْ وَرَبُّكَ الْأَكْرَمُ (3) الَّذِي عَلَّمَ بِالْقَلَمِ (4) عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ (5)

“Read! In the Name of your Lord, who has created (all that exists), Has created man from a clot (a piece of thick coagulated blood), Read! Moreover, your Lord is the Most Generous, who has taught (the writing), Has taught man that which he knew not” (Al-Alaq;1-5).

Concentration is an ability to focus thoughts, feelings, mind and all five senses to one object in a particular activity, accompanied by an effort to ignore other objects that have nothing to do with that activity. Children's learning achievement is influenced by many factors including concentration (Hakim, 2011). One of the several factors that influence the concentration of learning is hunger. These symptoms are usually experienced by students who do not have breakfast before entering the class. The students who are not having breakfast before learning activities will have a poor concentration in the classroom. It is because children experience an empty stomach around 10-11 hours. Students who do not have breakfast will experience symptoms of hunger, fatigue and drowsiness.

Fulfilling our energy intake, we must pay attention to halal thoyibban because the food to be consumed is as in the Qur'an:

وَكُلُوا مِمَّا رَزَقَكُمُ اللَّهُ حَلَالًا طَيِّبًا ۗ وَاتَّقُوا اللَّهَ الَّذِي أَنْتُمْ بِهِ مُؤْمِنُونَ

“Eat of that which Allah hath bestowed on you as food lawful and good, and keep your duty to Allah in Whom ye are believers” (Al Maidah;88).

The food consumed should not be excessive because it will be wasted. The despicable behaviour is not permissible and not good for the body, like in the Qur'an:

وَكُلُوا وَاشْرَبُوا وَلَا تُسْرِفُوا

“and eat and drink, but be not prodigal.” (Al Araf; 31).

Formulation of The Research Problem

The formulations of the research problem of this research are:

1. What is the characteristic on breakfast of intake energy of Islamic Boarding School students?
2. How is the level of energy adequacy of Islamic Boarding School students?
3. How is the level of concentration of Islamic Boarding School students?
4. There any effect of intake energy breakfast on the level of study concentration of Islamic Boarding School students?

Objectives Research

General Objective to analyse the effect of breakfast energy intake on learning concentration among Islamic Boarding School Students.

The specific objective of this study are to:

1. Know breakfast energy intake of Islamic Boarding School students.
2. Know the energy adequacy of Islamic Boarding School students.
3. Know the concentration level of Islamic Boarding School students.
4. Analyse the effect of breakfast energy intake on learning concentration level among Islamic Boarding School students.

Benefit of Research

This research has clear benefits and is practically as follows:

1. Theoretically, the results of this study are expected to provide preliminary information and data for research related to breakfast, intake energy breakfast and concentration of learning, this it can be used as a reference source in further research.

Practically, the results of this study are also expected to become data information for relevant Education Service Offices and Health Offices regarding the effect of breakfast energy intake on learning concentration level among students of Islamic Boarding Darussalam Gontor 2 For Girls. Also, the results of this study also expected to increase the knowledge and awareness of students about the importance of breakfast to increase concentration. This research for the school and the education office can be used as a reference in the implementation of an important breakfast program in the process of nutrition education in schools

Materials and Methods

Research Design

This study an observational study with a cross-sectional study design.

Time and Research Location

The research had been conducted in Islamic Boarding schools Darussalam Gontor 2 for Girls in East Java, Mantingan, Indonesia.

The research had been conducted within three months in December, calculated from December 26th, 2018 to February 28th, 2019.

Population and Sample

This research in the population should determine who and who is going to make the population. The population used this research were 251 female students in Islamic Boarding School Gontor 2 for Girls students in sixth grades class B to H.

The sample was a portion of the population and the number of objects smaller than the population. Sample Characteristic inclusion Characteristic:

- a. Student of Islamic Boarding School Darussalam 2 Gontor for Girls
- b. Sixth Grade of KMI or 3rd Senior High School
- c. Female students aged 16-19 years

Exclusion Characteristic sample is sixth Grade of KMI are sick, absent, and fasting.

The sampling technique used in this study was staffed random sampling. The sample size can be determined using the Slovin formula:

$$n = \frac{N}{(1+Nx(e)^2)}$$

Information:

n = Population size, a total sample of 251 female students in grades sixth Class B till H

e = Desired absolute precision (0,1)

So, the calculation is:

$$n = \frac{251}{(1+251x(0,1)^2)}$$

$$n = \frac{251}{3,52} = 72 \text{ students}$$

$$\text{drop out estimation} = 72 \times 10\% = 7,2$$

minimal sample subject

$$n = 72 + 8 = 80 \text{ students}$$

In this study there were two variables:

1. Independent variable: breakfast energy intake
2. Dependent variable: concentration of student learning in class

Some data of research were obtained through questionnaire, interview, and observation:

1. Interviews were used for obtaining data by direct dialogue with the respondent on multiple 24 hours recall.
2. Observation, conducting an observation of learning activities in the classroom.
3. The questionnaire was the instrument to collect multiple 24 hours of food recall data and grid concentration test.

Analysis Method

This research used random sampling method. In this study processing the data that has been collected, this study is continued with the steps:

1. Editing
Prepare and check the questionnaire list to calculate the number of calories consumed and calculate the concentration level of respondents.
2. Scoring
After going through the next editing phase, this research was continued by giving a score to the answers to the questionnaire and questionnaire given.
3. Tabulating
Data and answers were presented in the form of tables and attached in the form of frequency and percentage, to determine the percentage of data that has been analyzed.

Results

Overview of Islamic Boarding School Gontor 2 for Girls

Islamic Boarding School Gontor 2 for Girls was built in 2001. It is located in the west of the Islamic Boarding School Gontor 1 for Girls campus, occupies a land area of 6 ha. The existence of this boarding school aims to prepare students who will study at KMI Islamic Boarding School Gontor for Girls. At present, all activities at Islamic Boarding School Gontor 2 for Girls are under the responsibility of Ustadz H. Umar Sa'id Wijaya, S.Ag with the help of several other teachers (Data Advisory Council Gontor 2 for Girls,2018).

Islamic Boarding School Gontor 2 for Girls is in the process of education with a boarding school system, which is a boarding school that is supervised 24 hours both in academic and non-academic activities. Islamic Boarding School Gontor 2 for Girls has a dormitory, including:

1. Damaskus
2. Iskandaria
3. Makah
4. Madinah
5. Syanggit
6. Qatar
7. Aligarh
8. Santiniketan
9. Riyadh

The teaching and learning activities of Islamic Boarding School Gontor 2 for Girls are started at 7:00 a.m. until 12:15 p.m. WIB which take place in the classroom, then continued with the afternoon lesson at 2:00 p.m. until 3:15 p.m. WIB (Table 1). The following are the routine activities of the Islamic Boarding School Gontor 2 for girls as follows:

Table 1: Daily Activity Gontor 2 for Girls

Time	Daily Activity
04.00	Wake up
04.20	Subuh Prayer at Masjid
05.00 - 05.30	Daily Conversation
05.30 - 06.40	Take a bath, breakfast time, prepare to school
07.00 - 12.15	Learning in class
12.15 - 12.30	Dzuhur Prayer at Masjid
12.30 - 13.30	Lunch
14.00 - 15.00	Afternoon lesson
15.00 – 16.00	Ashar Prayer and Reading of Holy Qur'an
16.00 – 17.00	Take a bath and Free time
17.00 – 18.00	Reading of Holy Qur'an
18.00 – 18.30	Maghrib Prayer at Masjid
18.30 – 19.30	Dinner
19.30 – 20.00	Isya' Prayer at Masjid
20.00 – 21.30	Daily Night Study
21.00 – 22.00	Resting time
22.00 – 04.00	Sleep

*(Advisory Council Gontor 2 for Girls, 2019)

Their schedule was so tight from rising to bed. All daily executed, especially sixth grade, are very busy because of manage organisation and teaching afternoon class. Saturday until Thursday class starts at 7:00 am to 12:15 pm, continued by afternoon lesson. However, on Friday, it is a bit different because the students are free and their parents are coming to meet up with them.

This research took place on a Wednesday, December 26th 2018 at 9:00 am at the first break. The location took place in Islamic Boarding School Gontor 2 for Girls with sample research from Class sixth grades; there are 6 B to 6 H class. Each class is different; there are 34 students to 37 students. The objects on this research are the students grade 6 KMI whose ages are around 16-19 years. They had been breakfast, not fasting and on a diet on the day when data was obtained. The menu cycle of this dorm is seven days with three times large dishes (some rice, vegetable and animal protein and some vegetables. Menu served can be seen in Table 2, below:

Table 2: The Menu Cycle of Islamic Boarding School Gontor 2 for Girls

Time	SAT	SUN	MON	TUE	WED	THU	FRI
Breakfast	-Pecel	- Oseng	-Botok	-Bihun	-Teri	-Opor	-Nasi
	-Mi bakso	Kacang,	Krupuk	goreng	kacang,	Tahu	Kuning
	-Peyek	Tempe		-Krupuk	tahu	Tempe	-Telur
		-Krupuk			Kerupuk	-Kerupuk	Dadar iris
Lunch	-Sayur Bayam	-Bakso	- Bobor bayam	-Soto Ayam	-Sop Sosis	-Sayur Asem	Lodeh
	-Tempe goreng	-Pangsit	-Tempe Goreng	Krupuk	-Tahu balado	Bakwan	jipan
	-Sambal Terasi					Jagung	Tempe Krupuk
Dinner	-Telur puyuh	-Telur orak arik	- Telur goreng	-Capcay	-Sambal Goreng	-Ayam balado	-Tahu bacem
	-Tempe Balado	-Krupuk	-Krupuk	-Tahu bakso	kentang ati Ayam	-Kerupuk	-Krupuk
	Krupuk Udang				Kerupuk		

(Kitchen Staff Gontor for Girls 2, 2019)

Discussion

Research Subject Characteristics

Total of research subjects was 84 students from 6B to 6H class with their characteristics as follows in Table 3:

Table 3: Subject Characteristics

Variable	Mean ± SD
Age (years)	17,4 ± 0,69
Level of Calorie Breakfast (kcal)	491,5 ± 123,69
Level of Concentration (point)	21,6 ± 5,47

This research was conducted on class 6 KMI as a subject. The results (Table 4) showed that research used 2 variables such as level of calories breakfast and level of concentration. The ages of subject from 16 to 19 years old an average age of 17 years over 4 month. Level of calories

breakfast calories are three; over, adequate, and less. A good breakfast calorie is 15% - 30% of calories each day an average of 491.5 kcal (adequate). Level of concentration those were good, medium, and bad. A good level of concentration has a value of ≥ 11 points, an average of 21.6 points (good).

The research was obtained according Prihastuti (2012) that stated, the age of 16-19 years old had cognitive maturity. In this age able to concentrate well because it has a perfect brain so that it can focus the mind in a relaxed state in order to concentrate certain. According to Syahnur et al., (2013) that breakfast is good for providing energy intake for the brain in order to concentrate and make it easier to understand the lesson in a class. The breakfast fulfilling 15% to 30% of sufficient energy consisting of foods that are with balanced nutrition.

Research Subject Food Intake

The results of the research were 24 hours recalled for two days from the food menu by kitchen Islamic Boarding School Gontor 2 for Girls:

Table 4: The menu of Subject Food Intake

Time	Wednesday	Friday
Breakfast	-Teri,kacang tahu -kerupuk	-Nasi Kuning -Telur dadar iris -Kerupuk
Lunch	-Sop Sosis -Tahu Balado	-Lodeh jipan -Tempe -Kerupuk
Dinner	-Sambal goreng ati -Kerupuk	-Tahu Bacem -Kerupuk

Table 4 explained the menu consumed by subject on Wednesday and Friday, It is the main food consumed, prepared by the kitchen. Students take a complete meal from morning until evening they get 1585,8 kcal and Friday, they get 1528,3 kcal. *Estimate Average Requirement (EAR)* or mean of intake for students around 1194,9 kcal.

Dedeh (2010) that state many teenagers who haven't gotten enough energy. The factor affect intake students are laziness of eating to fulfil the calories needs, dietary habit, and favorite meal habits daily of menu the day. Snack usually consumed by students are snacks or chips, fried foods and soft drinks drinks. This research same with previous research states that adolescents prefer snacks and fast food (Santosa, 2012).

Distribution of Non-breakfast and Breakfast Students

The result of data interview respondent who had breakfast and not breakfast was in Table 5:

Table 5: Distribution Breakfast and Non-breakfast Students

Variable	(n)	%
Breakfast	84	33,73 %
Non-breakfast	165	66,27 %
Total	249	100 %

Table 5 showed that the breakfast taken by the subjects is 33,73% and the rest is non-breakfast, 66,27%. The research results show that 84 students (33,76%) had breakfast, and 165 students (66,27%) didn't. The reason why students did not had breakfast because they dislike menu of the day and did not want get to queue at kitchen because many activities in the morning. This study

same like research of Arisman (2011), did not get breakfast as the dietary habit of teenagers was often irregular, they tended to eat unscheduled and were happier to consume meals or snacks.

Level of Breakfast Students

Table 6 showed that the students had level of breakfast over are 44% a mean is 588,7 kcal. Level of breakfast adequate are 55% a mean is 454,2 kcal, and level of breakfast less are 1% a mean is 244,0 kcal. A good breakfast or level of breakfast adequate if it contains 25% of daily needs according to the research of Auliana (2012).

Table 6: Level of Breakfast Students

Level of Breakfast	(n)	%
Over ($\geq 30\%$)	37	44
Adequate (15-30%)	46	55
Less ($\leq 15\%$)	3	1
Total	84	100

Inadequate breakfast can effect to the consumed food intake as from interview result to subject, they were only take some bread, fried meals or other snacks without rice. This is same as Melvin's research (2012) meals of subject showed inadequate breakfast intake less than 20%, in opinion of Tjut Rifameutia, the activities of children in the morning require energy to learn with good concentration and activities with the environment. Breakfast for children is more active and concentrates on learning increases.

Level of Learning Concentration Students

The result grid concentration test subject should in the Table 7:

Table 7: Level of Learning Concentration

Level of Concentration	(n)	%
Good (≥ 21)	36	42,8
Medium (11-20)	46	54,7
Bad (00-10)	2	2,3
Total	84	100

The result of this research showed (Table 7) that students have good concentrations, about 36 students (42,8%) had a good level of concentration an average is 26,7 point. Next, 46 students (54,7%) had medium level of concentration an average is 18,2 point, and level of concentration less only 2 students (2,3%) an average is 8,5 point. The most of result subject had medium level concentration. The factor of level of concentration are social, non-social, and psychological factors. Social factors include teachers, and friends. Non-social factors include the environment, learning methods, infrastructure or facilities, training learning and culture and language. Psychological factors include memory, motivation, interests and talents. There are other factors, variety meals of breakfast and dietary habit also affect concentration (Dobelden ,2008).

The result of research (Lentini, Margawati, 2014) stated that good breakfast containing carbohydrates, protein, high fiber, protein, and low fat can contribute to the total intake for a day because it can add 25% to the total nutrient intake a day. This study showed a relationship with

the energy intake of breakfast and learning concentration, who were did not breakfast had an average level of concentration scores lower than students who had breakfast.

Level of Calories Adequacy Students

This table about percentage level of calorie adequacy those are over, equate, and less as in Table 8:

Table 8: Level of Calorie Adequacy

Level of adequacy	(n)	%
< EAR	48	57
≥ EAR	36	43
Total	84	100

Table 8 presented the subjects had enough calories intake around 43 % a mean is 964 kcal and did not had enough caloies intake around 57 % a mean is 1502 kcal. The research results showed that 84 students (33,76%) had breakfast, and 175 students (66,27%), a subject reason have no appetite for menuon that day. The reason why they did not had breakfast because they not have much time for breakfast and there were lots of activities in the mornings and no time to get queue at kitchen. According to the research of Arisman (2011), many did not get breakfast as the dietary habit of teenagers was often irregular, they tended to eat unscheduled and were happier to consume meals or snacks.

The Relation Between Calories of Breakfast and Concentration

This table about correlation level of calorie intake breakfast and level of Concentration, as follow in Table 9:

Table 9: Tabulation between calories of breakfast and concentration

Calories of Breakfast	Learning Consentration						Total	%	P-value
	Good	%	Medium	%	Bad	%			
Over	13	15.47	13	15.47	1	1.19	27	32.14	0.004
Adequate	32	38.09	23	27.38	1	1.19	56	66.67	
Less	1	1.19	0	0	0	0	1	1.19	
Total	46	54.76	36	42.85	2	2.38	84	100	

Table 9 explained that a subject had level of breakfast over calorie get a good concentration of 13 students (15.47%), a medium 13 students (15.47%) and a bad 1 student (1.19%). Students had level of breakfast adequate calorie get a good concentration of 32 students (38.09%), a medium 23 students (27.38%) bad 1 student (1.19%). Students had level of breakfast less calories, get a good concentration of 1 student (1.19%). Gamma corellation result test (Table 9), obtained p. Value 0,004 < 0,05 there was a relation between breakfast energy inake and learning concentration. This study get a significant one among them, it is related with the research of Dimiyati (2013) mentioned that someone's power of focus (concentration) would affect to learning, caused breakfast by main fuel carbohydrate which is ready to be used as glucose level, with a glucose the concentration of learning more increasing. In the opinion of Olivia (2013), if there are children had breakfast calories and get bad concentration or can be affect internal and external factors from the child and environmental factors.

The example of external factors are condition or situation, facilities, a lighting of the room, sound and pictures or displays on the wall that disturb the attention. Then, the example of internal factors are interest in deep learning (do not like certain subjects that are considered unattractive),

unsuitable planning schedule, and a state of decreased physical health can disrupt the concentration of learning. Environmental factors, for example, noise levels, arrangement and lighting of the study room, cleanliness and tidiness and as well as existing learning equipment. It is undeniable that there were female teenagers at the time of the research who did not focus on the concentration grid test, did not had breakfast or feeling anxious at the time of study, to improve or increase the concentration of student learning by keeping the body healthy healthy and calm the mind to get rid of problems that can interfere with the concentration of learning.

Conclusion

Based on research and details, we can conclude as follows:

1. The students's intakes staple food (rice), vegetables and animal protein, vegetables and snacks. They have seven day menu cycle and rarely consume animal protein and fruits.
2. Their energy intake is 1194,9 kcal. 43% of students got enough calories and 57% had fewer calories.
3. Students who had good concentration level is 42,8% students, medium level concentrations 54,7% and 2,3% had fewer calories.
4. There was significant correlation between intake calorie breakfast and level concentration on learning p value 0,004.

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