Association between the educational achievement and consumption of breakfast and snack in students

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ABSTRACT: Breakfast is an important meal. However, available information regarding the impact of this meal on the educational achievement of students is limited. The aim of this study was to evaluate the association between educational achievement in relation to eating breakfast and snack among primary school children in the school year 2010-2011. A case-control study was conducted among 100 girls selected through two-stage sampling from primary schools in fourth district of Tehran. Daily breakfast and snack consumption was collected using a questionnaire completed by the children’s parents. The scores of major courses were used as measures of educational achievement. 50 children who had the scores of less than 17 were randomly selected as the case group and 50 children with the score of more than 17 as the control group. Moreover, students’ height and weight were measured using standard tools. There was no significant difference in average height, weight, place of birth and birth weight between two groups. Our study indicated that children in case group consumed less breakfast and snack compared to control group (P <0/0001). The fathers’ job and parents’ educational level were significantly different between the two groups (P <0/0001). The findings of the present study show that breakfast and snacks are associated with the educational achievement of students. Therefore, eating breakfast and snack should be recommended by parents and teachers.

Keywords: Breakfast, Snacks, Educational achievement, Iran

INTRODUCTION

Educational achievement, means success in education, which can lead to very specific skills or expertise on the part of students, is an important question remains. Nutrition as an important factor in health can impact on student achievement. Children need good nutrition to meet their development needs. Food also plays an important role in the development and prevention of chronic diseases (Willet WC, 1994; Ames BN, 1998). Inadequate and poor nutrition in childhood can have affected health not only in childhood but also in adolescence and adulthood (Bao W et al, 1994; Srinivasan SR, 2002). Breakfast is an important meal. Based on studies done, children and adolescents who skip breakfast are at higher risk for obesity and overweight. Overweight and obesity in childhood can have adverse effects on their health (Figueroa-Munoz J et al, 2001). In recent years, several studies have reported on the habit of skipping breakfast as part of a contemporary lifestyle and the rate of skipping meals has increased worldwide. Actually skipping breakfast has become a common phenomenon. (Jafari-Rad et al, 2007) Evidence suggests that 10 to 30 percent European and American children go to school without breakfast. Very few studies have been done in this area. 8/16% of children in Ardabil and 7/20% of students in Gorgan most days of
the week go to school without breakfast (Nemati A et al, 2003; Joibari et al, 2003). Skipping breakfast is typically more common in girl (Woodruff SJ et al, 2009). Academic performance is effective on children's future and achievement educational opportunities, employment and a healthy lifestyle. In recent decades, declining academic performance in schools in developing countries has been observed (Lockheed ME, 2012). Undesirable food pattern, hunger and lack of school breakfast and snack can be the main reasons for this problem (Pollitt E, 1990; Pollitt E et al, 1981; Mahoney CR et al, 2005). Despite the importance of breakfast consumption on cognitive function and academic achievement, it seems that this problem has received little attention in Iran. Meanwhile, the students, especially elementary students make up a large percentage of young population. Therefore, study of factors affecting their achievement is a high priority. The aim of this study was to evaluate the association between educational achievement in relation to eating breakfast and snack among primary school children in the school year 2010-2011.

METHODS AND SUBJECTS

We conducted a case-control study with 100 female students aged 7-12 who were attending in primary schools in fourth district of Tehran. These students were healthy girl volunteers who gave prior written informed consent. Also informed consent was obtained from parents. The sample size was estimated to be 100 student in order to be able to detect significant differences in average mathematics, assuming a significance level of 0.05 (2-tailed) and a power of 80%. This estimation was based on the prior study. To select the participants in this study, a two-stage sampling method was used. To select the participants in this study, a two-stage sampling method was used. For this purpose, first the 20 public elementary schools cover education area 4 Tehran, 10 schools were randomly selected. In each school, based on the inclusion and exclusion criteria, 10 students were randomly selected. Inclusion criteria included physical and mental health, weight 30 to 40 kg, without failing in school, having a GPA above 17 for the control group and having a GPA of less than 17 for the control group. Early puberty and the onset of menstrual cycle, having any physical or mental illness, and taking supplements and medications were considered as exclusion criteria. To ensure physical and mental health in addition to asking students, parents, student health records were also examined. Also, School health teacher confirmed that students are healthy. Daily breakfast and snack consumption was collected using a questionnaire completed by the children's parents. The questionnaire included demographic information, rank and birth weight and was eating or not eating breakfast. To determine the internal reliability of the questionnaire was used the test of alpha Korenbakh, the 83/0, which indicates good reliability of the questionnaire. To determine test-retest reliability test questions were used in the outside. To determine the external validity of the questionnaire was used test-retest. 25 students completed the questionnaire and 10 days after the questionnaire was completed again, and the results were consistent in both periods (r=0.96). The scores of major courses were used as measures of educational achievement. The scores for math, literature, science, spelling and prior year and current year that records were used as criteria to determine student academic performance. Height was measured in standing position without shoes. Standard tool with an accuracy of 0.5 cm was used. Students were weighed on scales Seca. Accuracy of the measurements was 100 g. SPSS version 18 software was used for statistical analysis of data. T-test for comparison of quantitative variables between the two groups and the Chi square test was used to compare qualitative variables. Significance level of P<0.05 were considered.

RESULTS

A total of 100 students participated in the study (50 cases and 50 controls). The mean age of participants in the case and control groups, respectively, was 36/0 ± 2/11 and 46/0 ± 21/11 years. The mean height, weight, place of birth, birth weight was not significantly different between the two groups (Table 1). In terms of parental occupation and parental education level, there was statistically significant difference between the two groups (P<0.0001), however, the mother's occupation, there was no statistically significant difference between the two groups (P= 0.539). Between the two study groups in terms of breakfast consumption (used or not), there was a statistically significant difference (P<0.0001). Based on the survey results, 22 percent of participants in the case group reported that they typically have breakfast, while this figure was 80% in the control group. Between the two groups in terms of daily consumption of snacks, there was significant difference (P<0.0001). So that 72% of the control group participants typically used the snack, as the 54 percent of cases that they would normally eat snacks (Table 2).
**DISCUSSION**

The findings of this study showed that a greater percentage of students in the control group had breakfast. The results of the study conducted by Simeon et al (1989) on the effects of breakfast on cognitive and educational function of school children showed that omitting Breakfast result in lower grades in mathematics, this relation was more sensitive in children with poor nutrition and some degree of malnutrition (Simeon DT & Grantham-McGregor S, 1989). The results of a clinical trial study conducted in Jamaica indicated Compared with the control group, children who had received breakfast, showed a remarkable improvement in math scores and achievement test (Powell CA et al, 1998).

The study result of Murphy and colleagues with aim determine if a relationship exists between participation in a school breakfast program and measures of psychosocial and academic functioning in school-aged children revealed that higher rates of participation in school breakfast programs are associated in the short-term with improved psychosocial and academic functioning in student. Students who increased their participation in the school breakfast program had significantly greater increases in their math scores and significantly greater decreases in the rates of school absence and tardiness (Murphy JM et al, 1998). The results of the study conducted in Saudi Arabia showed there is a direct correlation between poor academic performance and omitting breakfast (Abalkhail B & Shawky S, 2002).

Based on the analysis done in Iran so far no studies on the relationship between breakfast and academic performance has been. But the results of a study conducted in Shiraz as breakfast intake pattern of short-term memory in girl student, showed a good breakfast with meat, less fat, carbohydrate, iron and vitamin B3 plays an important role in improving short-term memory (Sohrabi Z et al, 2010). This is consistent with the results of the present study.

Another finding of the study was significantly correlated snack consumption and improve students’ academic performance. So that the consumption of snacks in case (averaging less than 17), significantly lower than the control group (averaging more than 17).

Results of research carried out by Kleinman and colleagues in the field of influence of breakfast and snack foods in schools on academic performance and psychological-social, was found that by increasing student participation in the School Breakfast Program, math scores, psychological functioning-social and education had improved dramatically (Kleinman R et al, 2002). The results of research done by the Naieni and colleagues with aimed assess the impact of school meals on learning ability and academic achievement in elementary school students was Represents a substantial positive impact of nutrient intake in cognitive performance and academic achievement (Alaví SM et al, 2000). The results of a similar study conducted by Herrero et al also confirmed this relationship (Herrero LR & Fillat BJ, 2006). This result is consistent with present study in the snack impact on improving the academic performance of students.

So what has been said it is clear that omitting breakfast has adverse impact on academic performance and learning. It can be noted, the notation will be affected. The mechanism of this association may be described as based on maintaining blood glucose within normal and brain prefers to use glucose (Maffeis C et al, 2012). omitting Breakfast and hunger reduced glucose availability to the brain, since glucose is the brain's preferred fuel seems logical that omitting breakfast by low blood sugar affect the child's learning and mental performance (Hoyland A et al, 2009).thus, eating breakfast and snack, with hunger relief and prevention of hypoglycemia, enhancing cognitive performance (McNulty H et al, 1996; Alaimo K et al, 2001; Wolke D et al, 2001). The results of the present study
also suggest that between two groups of study in terms of parental education level and occupation of the father, there is a significant difference. The results of the study carried out by Reza-Khani et al, showed that more educated parents, omitting breakfast and snacks also were reduced. Also T-test showed that among the unemployed and working fathers, lack of breakfast was more than it consumes. But no significant difference between consumption and lack of breakfast and snack on working mothers and housewives were observed (Rezakhani H et al, 2011). The result of the present study confirms this finding. It appears that the increasing educational level of their parents' nutritional knowledge are enhanced, and this will improve the nutritional status of children.

CONCLUSION

The findings of the present study show that breakfast and snacks are associated with the educational achievement of students. Therefore, eating breakfast and snack should be recommended by parents and teachers.

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