

Impact of Skipping Breakfast on Various Educational and Overall Academic Achievements of Primary School Children in Northern of Jordan

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Abstract: *Background.* Previous studies showed that primary school children who are not skipping breakfast had high score of academic achievement compared to children who are skipping breakfast. *Objectives.* This study aims to identify the relationship between skipping breakfast and academic achievement of primary school children in the northern area of Jordan. Moreover, this study aims to identify the significance of skipping breakfast and selected demographics in predicting academic achievement. *Methods.* A descriptive correlation study was used. Participants in this study included 453 children from 3 areas of northern Jordan. Data collected included information related demographic characteristics of the sample and the child's academic achievement which was obtained through child's certificate. *Results.* Findings of this study support previous work that not skipping breakfast is an important factor for a good academic achievement among primary school children in northern Jordan. *Conclusion.* Skipping breakfast has an association with academic achievement. In Jordan, provision of school snacks or breakfasts, and proper nutritional health education may help promoting breakfast habit and healthy nutritional pattern.

Key words: Academic Achievement; Breakfast, Primary School, Children, Jordan

INTRODUCTION

Previous studies examining the association of breakfast consumption and academic performance in children and adolescents claimed that breakfast is the most important meal of the day. A positive and direct impact of breakfast on various educational and overall academic achievements was reported in previous studies. However, the quality of breakfast was variable within and between studies, students with low nutrition risk based on schools breakfast program tended to report better attendance and grades in math than children with higher nutritional risk (Kleinman, Hall, and Green, 2002). Taras (2005) argued that children are more likely to have low rates of lateness when a school breakfast program exists. In addition, findings support that children are better able to concentrate and absent less from school when consuming a breakfast meal before going to school (Edward and Evers 2001, Abalkhail and Shawky 2002). Thus, breakfast can positively impact children's health and wellbeing. For school-age children, in particular, skipping breakfast has been associated with lower cognitive abilities that may result from nutrition deficits and poor health. Those children are vulnerable to perform less well, and are more likely to repeat grades and drop out of school than better nourished children (Word Bank, 2009).

In Jordan, where more than 36.5% of the Jordan's population are below the age of 15 years (Department of statistics, 2009), issues of nutritional health is considered to be an essential element for the quality of child's education. Skipping breakfast affects young students' ability of concentration, attendance, and immune system (Galal and Hulett, 2003), hence, it is essential to assess the impact of skipping breakfast meal on academic achievement of primary school children. This assessment will help in improving the quality of health of school children and in turn will better reflect their education.

Further advocacy is needed for prevention of skipping breakfast related problems among Jordan's schools at the policy level. Because changes at this level will definitely affect the largest number of people across healthcare and community-based settings; community health nurse is well positioned to advocate for children, families and communities in implementing evidence-based activities designed to prevent breakfast problems. Community health nurse is in an excellent position to promote breakfast among school personnel by mandatory teaching school population about the importance of breakfast in improving the academic achievement of children and adolescents. Parents, as well, can be encouraged to provide breakfast for their children or explore the availability of a school breakfast program.

The primary research questions in this study are:

1. Is there a relationship between academic achievement and skipping breakfast for primary school children?
2. What is the relationship between skipping breakfast and academic achievement after controlling for demographic characteristics (age, gender, educational level, income, number of family member and mothers' education) among primary school children?

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MATERIALS AND METHODS

Subjects:

The population of this study consisted of school age children attending governmental and private primary schools at the Northern area of Jordan. Exclusion criteria were students less than 6 and students more than 12 years to exclude the changes that occur during puberty period. Children with chronic diseases were excluded related possible side effects of drugs which might affect the child's appetite or absorption of digestive system. All none Jordanian nationality students was excluded with attention to allow them to participate and excluded them later for ethical consideration.

Instruments:

Demographic data including: child's age, child's sex, class, parent's education, number of family members, monthly income and eating breakfast behavior was the first part of the tool. This part was completed by the child's parents or caregiver. The second part included the educational achievement of the child and it was evaluated through the values derived from the child's certificate "Jordan Certificate of Primary Education." These raw score of the "Jordan Certificate of Primary Education" consist of all students grades in all subjects of the curriculum where the schools usually keep a copy of this certificate. Child's record for the last academic year was retrieved.

Procedure:

A cluster random sample was obtained from entire public and private primary schools for both genders in northern Jordan during May 2010. A list of public and private primary schools in northern Jordan including children aged from 6-12 Year, was obtained from the Ministry of Education. The cluster sampling conducted in what is called "multistage sampling". First stage included the selection of northern Jordan governorate and randomly selecting three sub-governorates. Second stage was the selection of schools by listing all primary schools within each governorate and then randomly selecting a sample from each school. Third stage was the selection of a classroom. In this stage, the list of all classrooms in each school was listed in slips of paper and randomly selected. Finally, children were selected by using simple random sampling by listing all children enrolled in the classroom and then randomly selecting a sample.

Information about the study along with the study's questionnaire was sent home with the children to their parents. The parents were asked to retain the completed questionnaires with their children in the next day and then one of the research team collected the completed questionnaires. The questionnaire took approximately 5 minutes to be completed. Data related to child's academic achievement was obtained from "Jordan Certificate of Primary Education". A scale of 90 and above out of 100 meaning excellent, while 80-89% was very good; 70-79% = good; 60-69% = poor , 50-59 = very poor and less than 50% failed. The students scores mean in the Certificate were compared with the mean of the participants in relation to skipping breakfast.

Data Analysis:

Data analyses were conducted using the statistical package of Social Science (SPSS) version 17 computer program. Descriptive statistics was used to describe the characteristics of the sample according to mean, standard deviation, and the percentage. Point biserial correlation coefficient (r_{pb}) was used to measure the relationship between skipping breakfasts with academic achievement. To get more accurate indication of the relationship between academic achievement and skipping breakfast; Partial correlation coefficients was employed to statistically control the influence of demographic variables(age, gender, educational level, income, number of family member and mothers' education) on the relationship between skipping breakfast and academic achievement. The significance of skipping breakfast and selected demographics in predicting academic achievement examined using multiple regression analysis. The level of significance established for this study is set at an alpha level of ≤ 0.05 .

Ethical considerations:

This study was approved by the research ethical committees at the University of Jordan and Ministry of Education. A letter was sent to the Ministry of Education describing the nature and significance of the study, and requesting permission to have access to students and their records. Official administrators and staff members in the primary schools were informed about the study purposes and permission was requested to conduct the study using the appropriate channels of communication. A letter explaining the study and its purposes was sent to the parents/caregivers in order to obtain consent form and the permission for their children participation. Students and parents not wishing to participate were asked to return it unfilled. The confidentiality and anonymity of the information and measurements were assured. Moreover, the demographic questionnaire and measurements were coded by numbers to maintain confidentiality of the data.

Results:

The results of this study are based on the responses obtained through demographic questionnaire from 453 children attending primary schools in the northern area of Jordan. Demographic characteristics of the sample and correlation of skipping breakfast with academic achievement are presented.

Descriptive Characteristics of Study Sample:

Seven hundred and fifty questionnaires were distributed to randomly selected class of primary school children. However, only 453 children agreed to complete participation (241 male and 212 female) yielding a 60.4% response rate. Participant's age ranged from 6-12 years with a mean of 9.4 years. The grades of academic achievement regarding this sample range from 50-99 with mean 79.8 and SD (12). The percentage of children that usually take their breakfast before going to school was 77.3 % (n=350), whereas, the percentage of children skipping breakfast was 22.7 % (n=103) Table 1 shows the characteristic of this sample as follows;

Table 1: Descriptive Characteristics of the study participants (Primary School Children in Northern Jordan) (N=453)

Variables	Actual Range	M (SD)	% (n)
Age (Years)	6-12	9.4 (1.8)	
Gender			
Male			53.2%(241)
Female			46.8%(212)
Academic achievement	50-99	79.8(12)	
Breakfast			
Skipping Breakfast			22.7%(103)
Not Skipping breakfast			77.3%(350)
Mother's education			
Tawjehi or less			60.9%(276)
Higher than Tawjehi			39.1%(177)
Number of family Members			
1-3			02.9%(13)
4-6			51.6%(234)
7-9			36.2%(164)
> 10			09.3%(42)

The Relationship between Skipping Breakfast and Academic Achievement:

The first research question in this study aimed to identify the relationship between academic achievements and adherence to breakfast. Children were categorized into two groups; children skipping breakfast and children who are not skipping breakfast. The analysis utilize a point biserial correlation coefficient (r_{pb}) to explore the relationship between the children skipping breakfast and children not skipping breakfast in relation to academic achievement. This type of analysis allows detecting a relationship between a dichotomous independent variable (skipping versus not skipping breakfast) and interval dependent variable (academic achievement).

Data analysis revealed that there were a significant and positive, correlation between skipping breakfast and academic achievement $r_{pb} (451) = .30, p < .0005$, in which children who usually not skipping breakfast had high score in academic achievement than children who are skipping breakfast (Table 2). Though, the magnitude of correlation is considered medium between the two variables based on Cohen (1988) guidelines, this may due to the large sample used in this study and conserved level of power used to calculate the sample size.

Table 2: Zero-Order Correlation between Breakfast and Academic Achievement and Selected Demographic Variables of Primary School Children in Northern Jordan (N= 453)

	1	2	3	4	5	6
1 Academic Achievement						
2 Breakfast	.30 **					
3 Age	.07	.07				
4 Gender	.080	.093*	.010			
6 Income	.34**	.07	.01	-.08		
7 Family Number	.09	-.001	.06	-.09	-.11	
8 Mothers' Education	.28**	.02	-.02**	-.13**	.38**	.22**

Note: Total values may not add up to 453 due to missing data

* Correlation is significant at 0.01

** Correlation is significant at 001.

Skipping Breakfast and Academic Achievement after Controlling for Demographic Characteristics:

The second research question in this study aimed to explore the relationship between skipping breakfast and academic achievement after controlling for demographic characteristics (age, gender, educational level, income, number of family member and mothers' education) among primary school children. By statistically removing the influence of demographic variables (age, gender, educational level, income, number of family member and

mothers' education) to get a clearer and more accurate indication of the relationship between skipping breakfast and academic achievement partial correlation was utilized. This kind of analysis allows the researcher to examine the correlation and to control for additional variables that are suspected to influence the X and Y variables of interest. The result showed that a significant and positive partial correlation between breakfast and academic achievement $r(444) = .313, p < .001$ still exist. Inspection of zero order correlation ($r = .30$) suggesting that controlling for demographic characteristics responding had very little change on the strength of the relationship when r changed = .013.

Discussion:

The data from this study provided support for the relationship between having breakfast and academic achievement. The analyses showed that breakfast have strong correlation with academic achievement ($r_{pb}(451) = .30, p < .0005$). The analysis showed that primary school children who are not skipping breakfast had high score of academic achievement than children who are skipping breakfast. Children who skipped breakfast less often per week reported higher academic achievement. This result is congruent with Abalkhail and Shaway (2002). Kleinman, *et al.* (2002) found similar result in their experimental study, in which they found that school children who are classified as being nutritionally at risk before starting the school breakfast program had low grades at school. Whereas six month after starting breakfast program for children with high nutrition risk reported better mathematic achievement. Previous studies showed that breakfast have an effective role in improving child's academic achievement (Murphy, *et al.*1998) Kleinman, *et al.* 1998); Office of Research, Education, and the Center for Nutrition Policy and Promotion1998). Other studies found that breakfast helps increasing child's ability for composite math and reading scores, as well as it improves student behavior, decreases morning visit to the nurse, and increases student attendance (Barnard, 2000; Minnesota Department of Children Families and Learning, 1998).

Likewise, Gajre, Fernandez , Balakrishna , and Vazir (2008) found that skipping breakfast seems to cause inattentiveness and distractibility, influence memory and school achievement. Abidoeye (2000) found that skipping breakfast affect memory function which is likely to influence school learning and academic achievement. However, Powell, *et al.*(1998) found different result, in which they found that breakfast produced little positive effects on children's nutritional status and academic achievement.

Findings of this study support that children skipping breakfast are more likely to achieve poor academic grades. In this perspective, School nurse should assess skipping breakfast as a basis of care, especially for primary school children. Nursing intervention should focus on enhancing school children breakfast through community network. Nurse educator should be aware that skipping breakfast needs a solid education and preventive programs to enhance children health nutritional status and promote better academic achievement. In addition, to focus on the media and health education programs that encourages children to adopt healthy eating lifestyle. Innovative approaches need to be tried in order to gain maximum attention among school population.

Based on the study results a solid compensatory strategy must be developed to improve child quality of life regarding his/her nutritional health status and academic achievement. Like; provision of school snacks or breakfasts, and providing proper nutritional health education that focus on promoting breakfast habit and healthy nutritional pattern. Although, Jordan conducted nutritional program to enhance students' health in all primary schools, this program was terminated at the end of the year 2009. It is important here to stress the need for stakeholder to continue this program with further modifications. For example, in the last few years these breakfast programs at the primary schools of Jordan were promoted under the purpose of helping poor children which help add a stigma or labeling those children as a child with low income. Thus, with some modification on the purpose and continuous follow up of process of the program may provide benefits to the primary school children and provide success to the program. This will provide benefit to children and community.

Limitations:

A number of limitations should be highlighted in this study and which in turn may limits generalizability of findings to the total population of Jordan. For example, the study sample was restricted to the primary schools of the northern area of Jordan; a broader geographically diverse sample may produce different results. Caution is required when interpreting the findings because there is various numbers of variables influence skipping breakfast and academic achievement among primary school children and only few of them have been addressed in this study. This study is using a cross sectional design, therefore a prospective study might help in making better prediction through follow up, the cross sectional approach through what is found compared to other prospective studies enables making some conclusions. However, the longitudinal studies should focus on addressing the role of family, child-parents relationship, the role of school, observing of changes in physical activity and eating habits, sources of nutritional support and strategies in enhancing of taking breakfast among primary school children.

Conclusion:

Skipping breakfast has an association with academic achievement. The consequences of these problems include; malnutrition that leads to slow children physical and mental development, increase susceptibility to infections and reduces academic achievement, therefore, skipping breakfast can be considered as a barrier to optimal learning. Despite the fact that the sample was limited to northern Jordan, the findings of this study can be generalized to all children worldwide. Therefore, a community support of breakfast program along with effective strategies may help overcome this problem. Finally nurses should consider taking breakfast as a social behavior that is highly reinforced by friends, family, and habit.

Implications For School Health:

This study has many implications for school health nurses and other healthcare professionals who provide care for children in schools and primary care settings. Breakfast, mother's education and household income, were found to have an association with academic achievement among primary school children in northern Jordan. Mother's education, family income and breakfast were protective factors for malnutrition. These findings entail the stakeholders and healthcare providers in schools and primary health care settings to enhance healthy nutritional habits by encouraging having breakfast through mass media and through conference and lectures.

Although an important implication is to enhance the development of breakfast program or policy that emphasis the importance of promoting child's health status at school, the demand for effective breakfast programs will yield great dividends for funded educational resources. There is a need to develop and support the school breakfast health programs and nurses have to recognize their role in teaching the effective way on providing healthy breakfast meal despite the limited income and improving the families' knowledge about the sources of basic nutritional needs. Especially the primary school children have been favored from school-based breakfast health programs and found to have a great impact on child's health and academic achievement.

School nurse and healthcare professional should work collaboratively with the community to address the significant factors of skipping breakfast in children. Therefore, breakfast program should focus on teaching children and their parents choosing and preparing healthy meals, as well as how to support their children and overcome any unhealthy eating habits. Parents need to foster their role in supporting their child's nutrition throughout the different life stages in order to overcome nutritional problems.

Human Subjects Approval Statement:

We affirm that all identifying information regarding the study participants has been omitted and this study was approved by the Academic Research Committee at the Faculty of Nursing at the University of Jordan.

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