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The Effectiveness of "Philosophy for Children-Based Educational Program" on Breakfast Consumption of Elementary Students: A Randomized Clinical Trial

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ABSTRACT

Background: Attention to children's nutrition is important; since they are the most sensitive and vulnerable group in the community against malnutrition and food shortages. Therefore, this study aims to design, implement, and evaluate the effect of educational programs based on (philosophy for children) on thinking skills about healthy breakfast consumption of sixth-grade elementary school students in Yazd. **Methods:** The present clinical trial study was performed on 120 sixth-grade students of public schools in Yazd. Data were collected using a researcher-made questionnaire in control and experimental groups before and after the educational program. **Results:** The results showed that the mean score of critical thinking after the intervention (38.7 ± 81.1) in the experimental group (EG) increased compared to before the intervention (29.2 ± 96.4), which was statistically significant ($P < 0.001$). Based on the results, the difference observed in the mean score of critical thinking, caring, and creative thinking of sixth-grade students before and after the intervention in the two groups was significant ($P < 0.001$). On the other hand, the mean score of students' critical, caring, and creative thinking in the EG increased. In other words, the designed educational program improved all three skills in the EG. The mean scores of critical, caring, and creative thinking of sixth-grade students in the control group (CG) before and after the educational program in two stages were not significant ($P > 0.05$). **Conclusion:** According to the obtained results, the implementation of philosophy education programs for children raises the level of critical thinking, caring, and creative skills in students to eat a healthy breakfast. Therefore, increasing philosophical thinking in students and improving the studied skills through education, even virtually, can be very valuable and effective.

Keywords: Philosophy-based education; Thinking skills; Healthy breakfast; Students; Philosophy for children

Introduction

Proper nutrition is essential for health throughout life and is an important factor in students' learning and academic achievement (Karimi *et al.*, 2015). It is important to pay

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attention to the nutrition of children because they are the most sensitive and vulnerable group in the society against malnutrition and food shortages. Evidence suggests that poor nutrition in children reduces their resistance to infection, leading to an increase in disease and mortality, as well as a delay in the physical and mental development of children (Soliman *et al.*, 2021). Given that eating habits and dietary pattern are formed from childhood, nutrition modification during this period, especially in schools, can reduce the development of chronic diseases in adulthood (Franciscato *et al.*, 2019).

Studies have shown that malnutrition is very common in Iran. It has often been observed that nutrition in Iran is limited to the consumption of certain foods and there is no variation in the diet, the results of studies have shown that 50% of Iran's population is deficient in micronutrients, such as iron, iodine, calcium, and vitamins and per capita consumption of dairy products in Iran is almost one third of developed countries (Hosseini Kia *et al.*, 2017). The growth and development of children and the desired level of physical activity require sufficient energy, protein, and other nutrients. Nutrition in this relatively young age group and providing them to meet the needs of optimal physical and mental development, response to stimuli, memory reinforcement, mental concentration, and learning lessons are very vital (ET69, 2006, Naqibi *et al.*, 2015).

Breakfast is a very important meal that is the one of the most important aspects of child dietary pattern and behavior (Baghdadchi *et al.*, 2002). Proper breakfast should provide 25% of the total daily calories needed, equivalent to 750 calories for an adult with moderate physical activity. In this regard, education has always been emphasized as a key component of health promotion programs, including the facilitation of changing nutritional behaviors (Saghafipour *et al.*, 2017).

In 1960, while teaching philosophy at Columbia University in New York, Matthew Lippmann realized that his students lacked the power to reason and judge. He concluded that it was too late to strengthen the thinking power of these students,

and the power of reasoning should be strengthened from childhood (Saber *et al.*, 2021). Philosophy for children or thinking is a program for teaching deep philosophical thinking that fosters the power of reasoning, judgment, and purity in children and adolescents, which was first established by Matthew Lippmann in 1969 (Saber *et al.*, 2021). This approach promotes at least three types of critical thinking, creative thinking, and caring thinking, as well as reasoning skills in children and adolescents.

Critical thinking judges based on existing conditions and criteria. It gives us the opportunity to choose the best from different ideas and opinions. Creative thinking is a process of creating and nurturing new, useful, and valuable ideas, taking care of areas, such as thinking about values (considering the value of anything). Emotional thinking (experiencing a strong emotional response to a task), active thinking (enthusiastically taking care of something and trying to improve something), and theoretical thinking (something with what it could be) involves comparing.

The development of reasoning skills is done in the context of a story, or novel that will appeal to children (Lipman, 2003). New educations are trying to focus on the right methods of reasoning and thinking. Rapid changes in societies and the growing growth of information and the need to properly deal with these developments require education in the proper thinking and cultivation of analytical power. Therefore, the individual is able to adapt to these developments (Millett and Tapper, 2012). In this regard, research studies conducted by Ndofirepi and Cross (Ndofirepi and Cross, 2015), Nussbaum (Nussbaum, 2016), Leng (Leng, 2015), Colom (Colom *et al.*, 2014) suggest that the philosophy education program for children seeks to make students aware, critical, and thoughtful, in order to achieve knowledge in relation to the environment that belongs to them and to be able to use it in life situations.

Lotfabadi as well as Samadi, Ghaedi, and Ramezani (Latafabadi, 2006, Samadi *et al.*, 2011) acknowledged that students must learn to think purposefully and make correct judgments in

interpreting issues. Tabatabai and Mousavi's studied the effect of implementing a philosophy program for children on nurturing the ability to question and think critically of female students in the third to fifth grades of Alavi Elementary School in Varamin (Tabatabaei and Mousavi, 2011). They reported that implementing a philosophy education program for children can be explored to effectively foster the ability to question and think critically in elementary school girls and have a positive effect. Thus, researchers strongly believe that the philosophy of education program for children creates new ideas, and tries to address the current problem of current education, which makes learners passive in childhood and teachers and educators. The classroom has been transformed into a lifeless mind and the learner's mind has been transformed into a storehouse of information. So we can confidently say that if we make children reasonable, we will have sensible and wise citizens in the not-too-distant future. This program can affect both a person's personal life and a person's social life.

In general, sixth-grade elementary students have passed the stage of objective or tangible operations in terms of cognitive development, in which thinking is based on objective and real actions and situations, and have acquired the ability to perform logical actions (Lin *et al.*, 2020). Therefore, considering the positive effects of the philosophy for children approach in teaching communication skills and educational science issues, this study intends to determine its effect on breakfast consumption in sixth grade students in Yazd.

Materials and Methods

Study population: This clinical trial study was done with pretest-posttest on experimental and control groups. For this purpose, 120 students were selected using convenience sampling and they were cluster randomized to two groups, including experimental group (EG, n= 60, girl and boy) and control group (CG, n= 60, girl and boy).

Inclusion and exclusion criteria: The inclusion criteria were sixth-grade elementary school students and not eating or eating unhealthy

breakfast. The exclusion criteria were not attending educational classes and not completing the questionnaire.

Education process and data collection: The questionnaire was used for data collection. The educational package (story or animation with the theme of healthy breakfast) was used as a stimulus and motivation for thinking and discussing in the exploration circle. The study stages were designed in such a way that initially the type of breakfast of the studied students was recorded for one week before the educational program based on the breakfast reminder checklist, as well as the type of breakfast checklist consumed for one week after the educational program. Due to the COVID-19 pandemic and school closures, the virtualized recall checklist was completed by the student. The electronic questionnaire and test link were sent to the students through a class group in cyberspace. On the other hand, gifts were given to the students participating in this test to encourage and thank the students. Educational program (philosophy for children) based on healthy breakfast consumption of the EG was 5 sessions (each session was 45 min). The educational contents of each session are attached in the supplementary file.

The pre-test was performed in the first session and before the implementation of the educational program, and the evaluation and review of the materials and summarization were performed orally and discussed at the end of each session. The test was performed in a session two months after the educational program. Breakfast consumption information was also collected through a valid questionnaire.

Anthropometric measurements: Weight was measured when the participants were minimally clothed and without shoes using digital seca scales (Seca, Germany) and recorded to the nearest 100 g. Height was measured by a tape measure while children were standing in a normal position and were not wearing shoes. Body mass index (BMI) was calculated by dividing weight (kilograms) by the square of height (in meters).

Ethical consideration: The study was approved by the Shahid Sadoughi University of Medical Sciences, Yazd, Iran. The ethics committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran, also approved the study with the code number IR.SSU.SPH.REC.1399.093. Also, a total of 120 cases were selected and their parents signed the consent forms. IRCT id number is 50103 (<https://fa.irct.ir>).

Data analysis: Descriptive results of the study were expressed as number, percentage, mean and standard deviation. Also, to express the analytical results due to the normality of data distribution paired sampled *t-test* was used to compare the mean scores of critical thinking, caring, and creative thinking of students in each group before and after the educational program. To compare the groups with each other at the beginning and end of the study, an independent samples *t-test* was performed. The significance level of the study was 5%.

Results

The present study was conducted to design, implement and evaluate the effect of the educational program based on "philosophy for children" on thinking skills about eating a healthy breakfast on 120 sixth grade students in Yazd. Since the questionnaire did not have a grade point average and the students did not have stress, the parents stated that the students themselves had completed the questionnaire. The results were expressed as follows.

According to the **Table 1**, 41.1% of fathers and 58.1% of mothers had postgraduate education. Occupationally, 40.3% of fathers were workers, and 10.5% were housekeepers. Also, the results of chi-square in the two groups were not significantly different in any of the parameters (**Table 1**).

Based on **Table 2**, among the students in the test group, before the educational program, 53.3% ate breakfast on some days, and 8.3% ate breakfast every day. After the implementation of the educational program, forty one 68.3% of breakfast consumption was daily, and 0% consumption was rare. On the other hand, about breakfast

consumption place in the test group, 11 (68.3%) of students ate breakfast at home before the educational program, which changed to 60 (100%) of breakfast consumption at home after the educational program. In the CG, before the educational program 36 (60%) of students ate breakfast on some days, and after the intervention 33 (55%) had breakfast on some days. Regarding the place of breakfast consumption in the CG (before) 38 (63.3%) had breakfast at school, and after the intervention did not change much 36 (60%) had breakfast at school.

According to independent samples *t-test*, the mean scores of critical, caring, and creative thinking of sixth-grade students in the CG and EG before the educational program (**Table 3**) were not significantly different between the two groups ($P > 0.005$).

Based on the results of independent samples *t-test* (**Table 4**), the mean score of critical thinking, caring, and creative thinking of sixth-grade students in the EG after the educational program was higher than the CG. Also, the results of statistical analysis showed that the observed differences in all three thinking skills between the CG and EG were significant ($P < 0.001$). In other words, the implementation of the educational program improved all three skills in the experimental group.

Based on the paired samples *t-test* statistical analysis (**Table 5**), the mean scores of critical, caring, and creative thinking of sixth-grade students showed that the observed difference between the two stages before and after the educational program was not statistically significant ($P > 0.05$).

According to **Table 6**, the mean score of critical, caring, and creative thinking of sixth-grade students in the EG increased. Based on paired samples *t-test*, the results obtained in all three thinking skills were significant. In other words, the implementation of the educational program increased the mean score of all three skills of critical, caring, and creative thinking in the students after the educational program.

Table 1. Matching demographic characteristics in the control and experimental groups.

Variables	Control group		Experimental group		P-value ^a
	N	%	N	%	
Gender					
Girl	60	50.0	60	50.0	1
Boy	60	50.0	60	50.0	
Father literacy					
Illiterate	2	3.3	9	15.0	0.1
Less than a diploma	9	15.0	12	20.0	
Diploma	31	51.6	20	33.3	
Associate degree	15	25.0	14	23.3	
Bachelor's degree and higher	3	5.0	5	8.3	
Mother literacy					
Illiterate	0	0	6	10.0	<0.005
Less than a diploma	3	5.0	17	28.3	
Diploma	43	71.6	29	48.3	
Associate degree	8	13.3	6	10.0	
Bachelor's degree and higher	6	10.0	2	3.3	
Father's job					
Employee	17	28.3	9	15.0	0.35
Worker	22	36.6	28	46.6	
Self-employment	17	28.3	19	31.6	
Retired	3	5.0	4	6.6	
Unemployed	1	1.6	0	0	
Mother's job					
Employee	8	13.3	9	15.0	0.21
Worker	5	8.3	6	10.0	
Self-employment	16	26.6	7	11.6	
Retired	1	1.6	12	20.0	
Housekeeper	30	50.0	26	43.3	

^a: Chi-square test**Table 2.** Number and percentage of the frequency of breakfast consumption days in students before and after the educational program.

Variables	Experimental group		Control group	
	Before N (%)	After N (%)	Before N (%)	After N (%)
Number of breakfast consumption days per week				
Every day	5 (8.3)	41 (68.3)	7 (11.7)	7 (11.7)
Most days (4-5 days a week)	6 (10.0)	18 (30.0)	6 (10.0)	9 (15.0)
Some days (2-3 days a week)	32 (53.3)	1 (1.7)	36 (60.0)	33 (55.0)
Rarely (1-0 days a week)	17 (28.3)	0	11 (18.3)	11 (18.3)
The place of eating breakfast on school days				
At home	11 (68.3)	60 (100)	15 (25.0)	14 (23.3)
In school	32 (53.3)	0	38 (63.3)	36 (60.0)
Elsewhere	17 (28.3)	0	7 (11.7)	10 (16.7)

Table 3. Mean (\pm SD) score of critical, caring, and creative thinking of sixth-grade students between control and experimental groups before the educational program.

Variables	Control group	Experimental group	P-value ^a
Critical thinking	32.48 \pm 2.52	32.61 \pm 2.75	0.51
Caring thinking	24.41 \pm 2.59	24.63 \pm 2.46	0.37
Creative thinking	18.70 \pm 2.20	19.00 \pm 2.18	0.19

^a: Independent samples *t*-test.**Table 4.** Mean (\pm SD) score of critical, caring, and creative thinking of sixth-grade students in control and experimental groups after the educational program.

Variables	Control group	Experimental group	P-value ^a
Critical thinking	15.00 \pm 0.44	38.70 \pm 0.31	0.001
Caring thinking	15.00 \pm 0.23	30.00 \pm 0.18	0.004
Creative thinking	21.45 \pm 1.62	32.26 \pm 1.05	0.001

^a: Independent samples *t*-test.**Table 5.** Mean (\pm SD) score of critical, caring, and creative thinking of sixth-grade students in the control group before and after the educational program.

Variables	Before the educational program	After the educational program	P-value ^a
Critical thinking	30.06 \pm 2.64	15.00 \pm 0.31	1.00
Caring thinking	24.63 \pm 2.46	15.03 \pm 0.18	0.51
Creative thinking	19.06 \pm 2.18	23.26 \pm 1.05	0.17

^a: Paired *t*-test.**Table 6.** Mean (\pm SD) score of critical, caring, and creative thinking of sixth-grade students in the experimental group before and after the educational program.

Variables	Before the educational program	After the educational program	P-value ^a
Critical thinking	29.96 \pm 2.40	38.73 \pm 0.44	0.006
Caring thinking	24.41 \pm 2.50	30.00 \pm 9.30	0.001
Creative thinking	18.70 \pm 2.20	21.45 \pm 1.63	0.002

^a: Paired *t*-test.

Discussion

According to the research findings analysis, the implementation of the "philosophy for children" educational program on healthy breakfast consumption in sixth-grade students in Yazd had a positive and significant effect on increasing the mean score of all three areas of critical, creative, and caring thinking. At the beginning of the study, 63 (53.3%) of the studied students rarely ate breakfast on some days, and 33 (28.3%) rarely ate breakfast, 22 (18.3%) of students ate breakfast at

home, and 64 (53.3%) ate breakfast at school. After the educational program, the breakfast consumption at home increased significantly in the students of EG.

According to the literature review, so far no study has been conducted on the application of "philosophy for children" education in the field of healthy breakfast consumption and the field of health education in Iran. Therefore, it can be said that the present study was conducted for the first time and can be the starting point for similar

studies in this regard. Explaining the findings of the study, it can be said that not eating breakfast or eating unhealthy breakfast is due to low awareness of students and parents in managing healthy breakfast consumption and its positive effects.

Schools have a responsibility to address the values and beliefs of the community, to develop students' thinking in all areas, especially healthy breakfast consumption, to help improve the education and health of the next generation and to guide students' actions as present and future citizens. The mean score of critical thinking after the intervention in the EG increased compared to before the intervention, and the difference was statistically significant ($P < 0.001$). It indicates that the implementation of the educational program improved and increased the level of critical thinking in the EG. In this regard, Saberi *et al.* in a study to design and validate the curriculum model "philosophy for children" in the first year of high school in Iran, found that after ten sessions of intervention, students in the EG had a significant improvement in critical thinking skills (Saberi *et al.*, 2021). Cassidy *et al.* conducted a study entitled "Philosophy for Children: Learning to Live Better." They stated that by encouraging children to participate in philosophical discourse (educational programs), their interactions, and relationships with others, their critical thinking skills develop, which is consistent with the results of the present study (Cassidy, 2012). Isa Morad *et al.* also examined the critical thinking level of elementary school students in solving social problems. The results of their research showed that "teaching philosophy to children" has a positive and significant effect on the level of critical thinking of students due to changes in their philosophical thinking (Isa Morad Roudineh *et al.*, 2019).

Regarding the situation of the students in the control group in the dimension of critical thinking, in the present study, for the first time, 25 (42.7%) chose "I agree" and 43 (72.3%) chose "I have no opinion" options. In the second time of completing the questionnaire in this group, 60 (100%) of the students chose the option "I have no opinion",

indicating that there is no change and a low level of critical thinking skills in the CG. Based on the results, the answers given to the items in the critical thinking skills field in the EG before and after the educational program were different. Also, 100% of the students in the EG in the pre-stage, in response to the statement that "words and advice of friends play a role in eating unhealthy breakfast" chose the option "I disagree". Concerning the answers given to other items in the field of critical thinking skills in the second stage of completing the questionnaire, 100% in response to the item "Increase learning power, brain function, and health and reduce the risk of heart disease, stroke, cancer, and diabetes", selected the "I agree" option. Radji *et al.* showed that the "philosophy for children" program is related to critical education and students' critical thinking. Therefore, the implementation of educational programs is effective in promoting and changing students' thinking towards critical thinking (Radji, 2013). In the present study, the answers are given to the items in the field of critical thinking skills in "philosophy for children" in the EG before the intervention was as follows: 28 (47.9%) of students chose the option "I disagree". However, in this group, after the intervention 36 (89.6%) chose the option "I have no opinion", indicating that the intervention improved the critical thinking of students.

Careful thinking involves taking the necessary care and trying to listen to others and, increasing the capacity to understand the benefits. In the present study, the mean score of caring thinking skills in the EG increased after the educational program. For example, before the intervention 10 (16.7%) and after the intervention 60 (100%) of the students chose the option "I disagree" in response to the statement "There is no connection between the absence of obvious disease in the body and the health of the body". Before the intervention, 90 (5%) and 80 (13.3%) of students responded to the item "Physical health relationship only with physical health" and "Upset if health ambassadors were warned if they had an unhealthy breakfast" option. They chose "I agree" which after

the intervention of these answers was changed to 60 (100%) "I agree" option. In the present study, storytelling and poetry reading methods were used to improve thinking skills. In explaining the results of the present study, based on Lipman's view, it can be acknowledged that students' participation in philosophy education programs through stories and visual programs causes their learning strategies to develop due to the development of various mental skills, caring thinking, and self-regulation. This means that when students discuss topics in a group exploration circle through group reasoning and critical inquiry, these sessions develop their learning strategies by increasing the level of critical thinking. On the other hand, a review of research conducted in other countries has shown similar results. In a study entitled *Philosophy for Children*, a dynamic approach to teaching social studies in Japan and the United States and its positive implications, the results suggest that teaching philosophy to children can promote caring thinking in children (Makaiu and Tanaka, 2018), which is consistent with the results of the present study. Gimene-dsai *et al.* conducted a study entitled "The Long-Term Impact of Philosophy on Children". The statistical population in this study was 60 children aged 4 to 5 years. The number of 32 children was in the test group and 28 in the control group. The results showed a significant difference and improvement in the promotion of students' philosophical thinking, especially caring thinking among 5-year-old students in the experimental group compared to the control group (Giménez-Dasí *et al.*, 2013). Mamata *et al.* conducted a study entitled "The Impact of Islamic Philosophy on Environmental Behavior Based on Environmental Attitudes". This article acquired philosophical elements about conceptual theory and the importance of education in promoting human attitudes toward the environment by improving the level of students' caring thinking, which showed that the educational program was effective in promoting participants' caring thinking (Mamat *et al.*, 2012), which is consistent with the results of the present study. Similar studies have shown that although creative thinking is older than

its counterparts, unfortunately, for a variety of reasons, the research literature has paid less attention to caring thinking and its valuable aspects. Sharp *et al.* attributed the resistance to cognition or promotion, even more so to caring thinking, especially in education, to the lack of terminology for both critical and creative thinking skills. Even in the philosophy program for children, caring thinking is not well reflected (Sharp, 2007). In this regard, Bleazby *et al.* showed that the philosophy education program for children is effective on their cognitive abilities and flexibility due to improving the level of critical and creative thinking skills (Bleazby, 2006).

Creative thinking is a process that is used to create and nurture new, useful, and valuable ideas. The mean score of creative thinking among the students in the control group was not significantly different in the before and after stages ($P > 0.23$). In response to the items of creative thinking skills in the students of the CG before the educational program 76 (12.7%) of the students chose "I agree" and, after the educational program 42 (69.9%) chose "I have no idea". Regarding the situation of the students in the EG in the dimension of creative thinking, based on the answers given to the items of the questionnaire in this area, the results showed that before the educational program, more than 47 (79.1%) of students chose "I have no idea"; but after the educational program, more than 59 (99%) of students chose the "I agree" option. For example, in response to the statement "Waking up early in the morning for breakfast and not eating fast food at breakfast" before the educational program 80 (13.3%) and after the educational program 60 (100%) of students chose the "I agree" option. The results of the study by Jahanian *et al.* entitled "Aspects and Elements of Creating and Developing Creativity in Primary School Students in Alborz Province" showed that teaching philosophy to children affects cultivating students' creative thinking (Jahanian, 2016). Jafari *et al.* reported that teaching philosophy to children is effective in fostering critical and creative thinking and expression of preschool

children (Jafari *et al.*, 2015). Worley *et al.* in their study entitled "Philosophy and Children" stated that a philosophy education program for children can be effective in developing and improving reasoning ability, fostering creativity, fostering critical thinking, and fostering a moral understanding of experience. The results of their research showed that the implementation of the philosophy program for children, in addition to other variables, has a positive effect on the development of students' creative thinking (Worley, 2016). The results of this study are consistent with the results of Zhihua *et al.*, who showed that the philosophy education programs by relying on environmental protection improve students' thinking level (Zhihua, 2012). Worley *et al.* (Worley, 2016) and Komaria *et al.* (Komaria and Wicaksono, 2019) stated that the implementation of the philosophy education program for children through the exploratory circle method had a positive effect on the development of student's creative thinking.

According to the results of the present study, before the implementation of the educational program, the mean score of critical, caring, and creative thinking of sixth-grade students was not significantly different between the CG and EG. The mean score of critical, caring, and creative thinking of the sixth-grade knowledge in the test group after the implementation of the training program was higher than the CG, which was statistically significant ($P < 0.001$). In other words, the implementation of the training program has improved all three thinking skills in the test group.

The mean score of critical, caring, and creative thinking of sixth-grade students in the CG before and after the intervention showed that the difference was not statistically significant in the two stages ($P > 0.05$). The difference between the mean scores of critical, caring, and creative thinking of sixth-grade students in the EG before and after the educational program increased, which was statistically significant. In other words, the educational program increased the mean score of all three skills of critical, caring, and creative thinking in the students of the EG. Murriss *et al.*

conducted a study entitled "Philosophy Curriculum for Children on the formation of children's philosophical thinking in terms of creative, caring, and critical thinking". They reported that teaching philosophy to children can be effective in shaping these thoughts in children, and this educational program can be very effective in helping educators of children in their education (Murriss, 2016). One of the reasons for the consistency of this study with the current study can be related to the similarity in the philosophy education program and the type of research subjects.

The effect of teaching philosophy to children for the first time in improving healthy breakfast consumption in school children was investigated in this study. However, since the subjects of this study included sixth-grade students in public schools in Yazd, this study was also limited. Therefore, the study results cannot be generalized to other students at other times in urban and rural areas and private and non-public schools.

Conclusion

Given that one of the most important meals in students is breakfast, and consuming a healthy breakfast is very important in their growth and development and level of learning and memory, it is necessary to study the effect of teaching philosophy to children on thinking skills about eating a healthy breakfast. It seems that by including such educational programs in the school curriculum, appropriate steps can be taken to institutionalize and strengthen the skills of thinking about eating a healthy breakfast. However, since the subjects of this study were sixth-grade students in public schools in Yazd, the results of the study cannot be generalized to other students in other grades in cities and villages and private and non-selective schools.

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Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

Authors' contributions

KarimiRad M drafted the initial manuscript and provided content and data collection. Maghami HR and Hosseinzadeh M supervised data collection. Madadzadeh F completed all statistical analyses. Khodayarian M obtained funding for the study. All authors read and approved the final manuscript.

Conflict of interest

All authors declare that there is no conflict of interest.

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