

Relationship of Awareness, Perceived Benefits, and Perceived Barriers with Nutritional Behavior of Elementary School Students in Kashan

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A-R-T-I-C-L-E-I-N-F-O

Article Notes:

Received: Feb 07, 2020

Received in revised form:

Jun 29, 2020

Accepted: Jun 29, 2020

Available Online: Jul 19, 2020

Keywords:

Awareness

Behavior

Nutritional Sciences

Perceived benefits

Perceived barriers

Perception

A-B-S-T-R-A-C-T

Background & Aims of the Study: Correction of dietary patterns from childhood and beneficial nutritional behaviors form an important part of disease prevention. Therefore, the nutritional status of the students deserves assiduous attention. With this background in mind, the current study aimed to determine the relationship of awareness, perceived benefits, and perceived barriers with the nutritional behavior of elementary school students in Kashan.

Materials and Methods: This descriptive-analytic cross-sectional study was conducted in 2017. The statistical population included the fourth-grade students in Kashan. The sample size was calculated at 300 students (192 males and 108 females) using multistage sampling. The data collection tool was a standard questionnaire of perception, knowledge, and nutritional behavior. The data were finally analyzed in SPSS software (version 20) using multivariate linear regression tests, independent t-test, and one-way analysis of variance.

Results: As evidenced by the obtained results, the mean score of students' nutritional awareness was reported as 28.6 ± 3.77 , which was in the range of 0-34, yielding the maximum score of 32. The mean score of the nutritional behavior was 28.99 ± 3.1 falling in the range of 0-36, and the maximum score was 35. Moreover, it was observed that awareness ($P=0.003$), behavior ($P=0.01$), perceived barriers ($P<0.001$), and perceived benefits ($P<0.001$) had a significant relationship with gender. Furthermore, nutritional behavior was significantly associated with perceived benefits ($P=0.018$) and awareness ($P=0.04$).

Conclusion: The results of the present study indicated that the high level of awareness in students can promote healthy eating behaviors in them. Training courses in healthy eating education are recommended for students and their parents.

Please cite this article as: Seyedi F, Ahmadi Z, Gharlipour Z, Izadkhan FS, Arabshahi A. Relationship of Awareness, Perceived Benefits, and Perceived Barriers with Nutritional Behavior of Elementary School Students in Kashan. Arch Hyg Sci 2020;9(3):168-178

Background

Nutrition plays a vital and direct role in

health promotion and maintenance since nutrition is essential for all the vital functions of the body. According to available documents, unhealthy eating habits are currently observed

in children and adolescents in our society. Apart from threatening the health of this group, these behaviors will put the society at risk for non-communicable disease epidemic in the next two decades (1). Evidence suggests that malnutrition in the early years of life is responsible for the dismal growth of children, short stature, and mental retardation. Moreover, it leads to recurrent respiratory infections, resistance to treatment, and reduced physical activity (2).

Adult behavioral patterns and eating habits are rooted in childhood and adolescence. Therefore, following a varied and balanced diet during childhood will help prevent chronic and incurable diseases in the future (3). Children are at risk for such adverse effects as iron deficiency anemia, obesity, indigestion, and tooth decay in the short term, and chronic and dangerous cardiovascular disease, cancer, heart attacks and strokes, or diabetes in the long term. (4). People urgently need nutrients for their growth in the age range of 7-15. On the other hand, undernourished students are less able to concentrate and learn and have a marked academic decline (5).

According to UNICEF statistics, 11%, 5%, and 15% of Iranian children have moderate to severe underweight, moderate to severe emaciation, and moderate to severe short stature, respectively (6). According to the United States Department of Health & Human Services, 61% of American teens use snacks that are high in fat and carbohydrates and low in fiber. It can cause such problems as obesity, hyperlipidemia, and the spread of chronic disease (7, 8). One of the causes of nutritional deficiencies in children and adolescents is unawareness of the importance of consuming a wide variety of foods and wrong diets, such as eating a variety of ready-to-eat meals, sweets, and chocolate.

Consumption of these kinds of foods reduce the physical and mental efficiency of children and adolescents. Moreover, its adverse effects

would be demonstrated in various forms, such as diabetes, hypertension, cardiovascular disease, and hyperlipidemia in the coming years. Therefore, it is necessary to adhere to proper nutrition and have a healthy diet that includes a balanced amount of different foods from each food group (9). A study conducted by Shim et al. (10) demonstrated that increased nutrition knowledge improves eating habits. According to a study performed by Wardle et al. (11), nutritional awareness improved the quality of diet and healthy eating behaviors.

Since most eating habits are formed in childhood and adolescence, it is important to devote assiduous attention to nutritional awareness, attitudes, and eating behaviors (12). If health promotion programs are designed based on people's knowledge, attitudes, and behaviors, they can be successful in terms of healthy eating. Proper nutritional behavior regarding healthy eating principles requires awareness in this area. Although knowledge is not the same as behavior, it can be considered a determining factor in nutritional behaviors.

Correction of nutritional behaviors in childhood and adolescence, which are associated with developmental stages, can bring many benefits. These benefits include proper design and implementation of a national school food program in order to solve nutritional problems and ensure health in this age group. These programs increase undernourished students' concentration during the learning process and improve their performance by the elimination of short-term starvation (13).

Pender's health promotion model (HPM) is one of the widely used models to change unhealthy behaviors and promote health. This model is a preventive model that regards behavior as a function of one's knowledge and attitude (14). The present study is part of the Health Belief Model, which is based on disease prevention and potential adverse effects. It is the first model specifically developed to correct behaviors related to health promotion. One of

the applications of this model is the promotion of healthy eating behavior (15).

Considering the critical importance of nutrition in primary school students, the present study aimed to determine the relationship of awareness, perceived benefits, and perceived barriers with the nutritional behavior of elementary school students in Kashan.

Materials & Methods

This descriptive-analytic cross-sectional study was conducted in 2017. The statistical population included the fourth-grade students in Kashan. The sample size was calculated at 300 students (192 boys and 108 girls) using the formula of estimating the sample size for mean comparison based on the study performed by Alizadeh et al. (16). Study subjects were selected by multi-stage sampling, and the list of primary schools in Kashan was initially obtained from the Department of Education. Thereafter, the list was classified according to the type of school (governmental-non-profit) and gender of students.

Subsequently, a public boys school, a public girls school, a non-profit boys school, and a non-profit girls school were randomly selected from each category. Thereafter, one class was selected from each school, and participants were randomly selected. In the case of classes with a large number of students, 20 students were randomly selected.

The inclusion criteria were as follows: 1. the fourth-grade elementary student, 2. willingness to participate in the study, 3. attending school during research. On the other hand, the exclusion criteria entailed: 1. Unwillingness to participate, 2. discontinued participation in the research program, 3. disease, and 4. absence from the class on data collection day. The data collection tool was the standard questionnaire for measuring awareness, perception, and behavior. The questionnaire consisted of

demographic questions, awareness questions (n=17), behavior questions (n=13), perceived barriers (n=6), and perceived interests (n=5).

Regarding scoring, in the section of awareness questions, each correct answer was assigned a score of 2, incorrect responses were scored 0, and don't know answers were assigned a score of 1, yielding a range of 0-34. In the behavior questions section, the most desirable state was assigned a score of 3 while the worst state was scored 0. For perceived benefits, a score of 2 was assigned to "I agree", 1 to "No idea", and "I disagree" was scored 0. In the perceived barriers section, "I agree" was scored 0, "no idea" was assigned a score of 1, and "I disagree" was rated as 2.

Cronbach Alpha Coefficient of 0.80 confirmed the reliability of this questionnaire (16). Validity of the questionnaire was approved in the study conducted by Alizadeh et al. (6) in which 10 copies of the questionnaire were provided to 10 health and nutrition education specialists, and the formal and content validity was confirmed. The data were analyzed in SPSS software (version 20), and the students' mean scores of awareness, behavior, perceived benefits, and perceived barriers were initially calculated. Measures of Central Tendency and dispersion were used for data presentation, and the data were finally analyzed using multivariate linear regression tests, independent t-test, and one-way analysis of variance.

It is noteworthy that the present study was approved by the Ethics Committee of Kashan University of Medical Sciences with the code IR.KAUMS.REC.1395.28. Ethical considerations were also observed by explaining the objectives of the study to patients, voluntary nature of participation, and obtaining informed consent.

Results

Based on the results of the study, 108 (36%) of students were female and 192 (64%) were

male. Regarding economic status, 71 (23.7%), 96 (32%), 43 (14.3%), and 90 (30%) of cases were very good, good, average, and poor, respectively. In terms of parents' education, 123 (41%), and 132 (44%) of fathers and mothers had an academic education, respectively. Considering parents' profession, 92 (30.7%), and 45 (15%) of fathers and mothers were employees, respectively. (Table 1).

The mean scores of students' nutritional awareness and nutritional behavior were obtained at 28.66 ± 3.77 and 28.99 ± 3.99 (Table 2).

The ANOVA test revealed that none of the variables of awareness ($P=0.0575$), performance ($P=0.193$), perceived barriers ($P=0.401$), and perceived benefits ($P=0.466$) was associated with mother's occupation. According to the results, there is no relationship between mother's education and awareness ($P=0.379$), and

perceived barriers ($P=0.641$). Nonetheless, perceived benefits ($P=0.004$) and nutritional behavior ($P=0.046$) are associated with mother's education. In this regard, the mean score of nutritional behavior and perceived benefits in students with illiterate mothers was lower, compared to other students (Table 3).

As illustrated in Table 3, the ANOVA test found a relationship between the perceived benefits ($P=0.001$) and father's occupation. In this connection, the children whose fathers were laborers had less perceived benefits; nonetheless, father's occupation showed no significant relationship with perceived barriers, awareness, and behavior ($P<0.05$). Moreover, father's education was found to be significantly correlated with awareness ($P=0.014$), perceived benefits ($P=0.017$), and nutritional behavior ($P<0.001$). In this regard, students with illiterate fathers had less nutritional awareness, nutritional behavior, and perceived benefits. In addition, there was no significant relationship between perceived barriers ($P=0.054$) with father's education.

As displayed in Table 4, the ANOVA test showed that awareness ($P = 0.052$), perceived barriers ($P=0.989$), and perceived benefits ($P=0.137$) are not significantly associated with economic status. Nevertheless, a significant relationship was observed between nutritional behavior and economic situation, and the mean nutritional behavior is higher in people who are in a very good economic situation. The independent t-test demonstrated that gender had a significant relationship with students' awareness ($P=0.003$), nutritional behavior ($P=0.010$), perceived benefits ($P<0.001$), and perceived barriers ($P<0.001$). Furthermore, the mean score of girls in all four variables was

Table 1) Demographic characteristics of participants

Demographic variables		Number(percent)
Father's education	Academic education	123(41%)
	High school	55 (18.3%)
	Junior high school	47 (15.7%)
	Primary school	39 (13%)
	Illiterate	7 (2.3%)
Mother's education	Academic education	132 (44%)
	High school	60 (20%)
	Junior high school	31 (10.3%)
	Primary school	40 (13.3%)
	Illiterate	8 (2.7%)
Father's occupation	Employee	92 (30.7%)
	Laborer	59 (19.7%)
	Free-lancer	125 (41.7%)
	Others	9 (3%)
Mother's education	Employee	45 (15%)
	Housewife	226 (75.3%)
	Others	21 (7%)

Table 2) Mean and standard deviations of awareness, health behavior, perceived barriers, and perceived benefits

Variables	Minimum	Maximum	Mean	Standard Deviation	Range
	8	32	28.66		0-34
Nutritional behavior	20	35	28.99		0-36
Perceived barriers	0	10	9.03		0-10
Perceived benefits	2	12	9.6		0-12

Table 3) Relationship of demographic characteristics with awareness, perceived barriers, and perceived benefits

Demographic characteristics	Awareness		Perceived barriers		Perceived benefits		Nutritional behavior		
	Mean±SD	Significance level	Mean±SD	Significance level	Mean±SD	Significance level	Mean±SD	Significance level	
Father's occupation	Employee	28.98±3.56	P=0.206	9.51±2.19	P=0.065	9.25±1.50	P=0.001	29.47±2.79	P=0.065
	Laborer	27.75±4.48		9.09±2.37		8.03±3.05		28.19±3.2	
	Free-lancer	28.82±3.16		9.86±2.17		9.24±1.72		28.77±3.49	
	Others	29.37±3.66		11.0±1.82		9.55±1.33		31.5±2.50	
Mother's occupation	Employee	29.02±3.26	P=0.575	9.26±2.06	P=0.401	8.73±2.16	P=0.466	29.8±3.03	P=0.193
	Housewife	28.60±3.78		9.64±2.31		9.11±1.93		28.83±3.07	
	Other	28.61±3.79		10.04±1.46		8.80±2.61		29.62±3.1	
Father's education	Illiterate	23.66±8.52	P=0.014	10.4±1.14	P=0.524	6.66±5.1	P=0.017	25.33±2.51	P<0.001
	Elementary school	29.16±2.70		9.62±2.66		9.43±1.50		29.36±2.21	
	Junior high school	29.9±2.45		9.29±2.43		8.59±2.44		27.56±3.24	
	High school	28.63±3.84		10.01±1.74		9.07±1.89		27.92±3.09	
Academic education	28.74±3.75	9.55±2.28	9.14±1.76	29.86±3.04					
Mother's education	Illiterate	25.71±4.53	P=0.379	9.32±2.94	P=0.641	6.0±4.89	P=0.004	26.5±3.0	P=0.046
	Elementary school	28.97±4.03		10.0±2.35		9.42±1.25		29.32±2.34	
	Junior high school	28.51±4.38		9.17±2.56		8.67±2.31		28.33±3.0	
	High school	28.74±3.43		9.70±1.95		9.07±1.99		28.09±3.30	
Academic education	28.61±3.92	9.62±2.1	9.06±1.95	29.6±3.152					

Table 4) Relationship of demographic characteristics with awareness, perceived barriers, and perceived benefits

Demographic characteristics	Awareness		Perceived barriers		Perceived benefits		Nutritional behavior		
	Mean±SD	Significance level	Mean±SD	Significance level	Mean±SD	Significance level	Mean±SD	Significance level	
Economic status	Very good	29.04±3.28	P=0.528	9.55±2.32	P=0.989	9.38±1.13	P=0.137	30.15±3.06	P=0.015
	Good	28.86±4.39		9.60±1.99		9.09±2.0		28.46±3.25	
	Average	28.56±3.09		9.6±2.30		9.16±1.72		28.13±2.89	
	Poor	28.19±3.70		9.68±2.30		8.63±2.56		28.88±3.06	
Gender	Female	29.51±3.74	P=0.003	10.37±1.93	P<0.001	9.78±0.872	P<0.001	29.75±2.98	P=0.010
	Male	28.14±3.71		9.14±2.24		8.57±2.35		28.51±3.22	

Table 5) Results of the linear regression of factors related to students' nutritional behavior

Variable	non-standardized β	Standard deviation	P-value	confidence interval	
				Minimum	Maximum
Constant value	19.51	2.62	P<0.001	14.3	24.69
Awareness	0.157	0.077	P=0.04	0.004	0.310
Perceived benefits	0.352	0.147	P=0.018	0.061	0.642
Perceived barriers	0.165	0.113	P=145	-0.058	0.388

higher, compared to boys (Table 4).

The results of the regression model showed that an increase in awareness (P=0.04) and the perceived benefits (P=0.018) scores was significantly associated with an increase in students' nutritional behavior. However, perceived barriers displayed no effect on students' nutritional behavior (Table 5).

Discussion

In the current study, the mean score of students' nutritional awareness was relatively

good. In line with our study results, the mean score of awareness was relatively good in the study performed by Khakpour et al. (1). Nevertheless, inconsistent with the results of the present study, in their research, O'Brien et al. and Parameter et al. indicated that students did not have sufficient nutritional awareness (17,18). Studies on the nutritional status of students in Iran are indicative of the low level of awareness and nutritional performance in this age group, and most researchers have emphasized that further studies should be conducted in this field (19-22).

It seems that food and nutrition information

in science books, as well as the sensitivity of school health educators to students' nutritional knowledge, has led to a relatively favorable nutritional awareness in students included in the present study. In the present study, the mean score of students' nutritional behavior was at a desirable level. In a study carried out by Ostad Rahimi et al. (23), despite the favorable level of awareness and nutritional knowledge, most subjects had unbalanced eating behaviors. In a study conducted by Talatappeh et al. (3), the level of awareness and performance was reported to be at a moderate level, while in our study, awareness and performance were at good levels.

These discrepancies can be ascribed to differences in the research setting, sample, and time. Sometimes such factors as friends' tastes or lack of access to healthy food or good packaging affect students' eating behaviors. It seems that students' desirable nutritional behavior is related to their high level of awareness. Awareness can be a determining factor in nutritional behaviors. Furthermore, in the present study, the mean score of the perceived barriers and the perceived benefits were relatively favorable.

It can be said that school health educators and students' parents have greatly increased children's knowledge about the beneficial effects of eating breakfast on school performance and using fruit, milk, and yogurt to keep your bones and muscles strong and healthy. Moreover, they discouraged students from eating unhealthy and available foods, such as chips and cheese puffs, and skipping breakfast. The present study showed that nutritional behavior has a significant relationship with awareness.

The results of studies conducted by Alizadeh (24), Yoon (25), Wardle (11), Huang (26) Koci (27) showed that increased awareness has a significant relationship with student's nutritional behavior. In this regard, students with higher nutritional awareness demonstrated better nutritional behavior. The

results of the present study revealed that behavior has a significant relationship with nutritional awareness. These results are in line with the results of the study performed by Alizadeh (24). Good performance has not been reported in numerous studies despite high awareness (28,29).

Contrary to the findings of the current study, the results of studies carried out by Rasouli (30) and Niknami (31) noted that increased nutritional awareness does not necessarily bring about a change in behavior. Nutritional knowledge is not the only factor that can affect people's nutritional behavior. In other words, unhealthy nutrition is a multifactorial problem which can be affected by other factors. It seems that in the present study, the nutritional awareness of students, which was at a relatively good level, resulted in a favorable level of students' nutritional behavior.

Because nutritional awareness can be a predictor of healthy eating behavior. The results of the present study showed that behavior has a significant relationship with perceived benefits, while there was no significant relationship between behavior and perceived barriers. These results are consistent with the results of the study by Alizadeh in terms of the relationship between behavior and perceived benefits. At the same time, these results are contrary to the results of the mentioned study regarding the relationship between behavior and perceived barriers.

In the study by Alizadeh, a significant relationship was observed between nutritional behavior and perceived barriers (24). Examining this result, it can be concluded that students who are aware of the benefits of eating breakfast and healthy foods such as milk, yogurt, bread, cheese, and walnuts do so in practice. On the other hand, they may be aware of the dangers of eating unhealthy foods, such as chips and cheese puffs, and skipping breakfast; nonetheless, they do not observe it in practice. It seems that chips and cheese puffs

with delicious flavors are appealing to students and this interest has discouraged them from healthy eating.

In accordance with the results of a study conducted by Peyman et al., in the present study, no significant relationship was detected between mother's education and nutritional awareness (32). Furthermore, gender was found to be directly and significantly associated with awareness, behavior, perceived barriers, and perceived benefits. Consistent with the results of our study, in a study performed by Isazadeh et al. (33), the difference between gender and the nutritional behavior score was statistically significant.

In line with the results of our study, Sharifnia et al. (34) found no significant relationship between parental occupations and health awareness. In accordance with the results of the present study, Khazaie et al. (35) observed a significant relationship between father's job and perceived benefits. Similar to the results of our study, Peyman et al. (32) state that there is no significant difference between mother's education and nutritional awareness. The mentioned study also found that perceived awareness and benefits were associated with father's education, and perceived benefits were associated with mother's education and father's employment.

However, mother's education and occupation displayed no significant relationship with perceived awareness and barriers. In a study performed by Vafae-Najar et al. (36), there was no significant relationship between students' awareness score with mother's education and occupation. Nonetheless, consistent with our study results, a significant relationship was observed between father's education and students' awareness score. It can be attributed to the fact that educated fathers, who are also employees, pay more attention to the nutritional status of their children due to their higher awareness of the harmful effects of poor nutrition and unhealthy eating.

Nutritional awareness in the father of the family can raise the nutritional awareness of children. In the present study, a significant relationship was observed between the economic status of the family and the nutritional behavior of students. This result can be ascribed to the fact that economically well-off families pay more attention to breakfast and eating healthy foods, such as milk and yogurt, which are essential for the mental well-being and growth of bones, compared to low-income families. Low-income families may not be able to provide their children with healthy foods such as milk and walnuts at high prices.

Every study has some limitations which should be addressed in the paper. One of the limitations of the current study is the self-report nature of the questionnaire, which is often relied upon in most behavioral studies. Moreover, the present research was performed only on students. Nevertheless, families, especially mothers, play a peculiar role in shaping students' eating habits. Therefore, it is required to conduct further studies with the cooperation of students and their mothers.

The executive limitations of this program include the non-cooperation of school officials and the allocation of incentives to school officials who have had good cooperation in this regard. The strengths of the current study entailed a sufficiently large sample size and multi-stage sampling.

Conclusion

The results of the present study pointed to a significant relationship between nutritional awareness and nutritional behavior. In other words, increased nutritional awareness can improve students' eating behavior. Students perform a critical role in the future of the country and a large part of nutritional habits are formed in childhood and adolescence, and these habits form food preferences in the coming years.

Therefore, it is recommended that students and their parents receive educational training regarding healthy eating patterns, the use of breakfast and snacks, and prohibition of malnutrition-providing foods based on behavior change models that promote nutritional behaviors in other educational levels and others regions of the country, especially the deprived areas.

Footnotes

Acknowledgements

The current article was extracted from a research project approved by the Research Vice-Chancellor of Kashan University of Medical Sciences (IR.KAUMS.REC.1395.28). The authors' deepest appreciation goes to all students, school authorities, Kashan Department of Education, and all those who sincerely helped us in different stages of this research project.

Funding

The current study was financially supported by a grant from Kashan University of Medical Sciences.

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of the current article.

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Appendix**Deputy of Food and Drug, Kashan University of Medical Sciences****Awareness level**

3. Which meal is more important to you?

breakfast lunch dinner I have no idea

2. Which of the following food items is harmful to our health and which is good for us?

Row	Food item	Beneficial	Harmful	I have no idea
1	Cheese puffs			
2	Chips			
3	Milk			
4	Ice-cream			
5	Nuts			
6	Fizzy drinks			
7	Fruits			
8	Vegetables			
9	Excessive sweets consumption			
10	Doogh			
11	Sausage and ham			
12	Fruit juice			
13	Kashk			
14	Cheese			

3. Do we need to eat snacks between meals?

Dietary habits

1. Do you eat breakfast?

Yes No

If yes, how many times a week?

5-7 times a week 3-4 times a week 1-2 times a week 2. Do you eat snacks? Yes No

If you do so, how many times a week?

5-7 times a week 3-4 times a week 1-2 times a week

What foods do you eat as snacks?.....

3. Do you eat sweets and chocolate? Yes No

If yes, how much?

Too little about right too little **4. Do you eat chips?**5-7 times a week 3-4 times a week 1-2 times a week I do not eat chips**5. Do you eat cheese puffs?**5-7 times a week 3-4 times a week 1-2 times a week I do not eat cheese puffs

6. Do you drink fizzy drinks?

5-7 times a week 3-4 times a week 1-2 times a week Never

7. Do you eat fruits?

5-7 times a week 3-4 times a week 1-2 times a week Never

8. Do you eat bread and cheese?

5-7 times a week 3-4 times a week 1-2 times a week Never

9. Do you use milk or yogurt?

5-7 times a week 3-4 times a week 1-2 times a week Never

10. Do you drink doogh?

5-7 times a week 3-4 times a week 1-2 times a week Never

11. Which one is the manufacturing logo of the Food and Drug Administration?



a)



b)



c)

d) none

12. Which of the following should be considered when buying food?

a) product name b) Production and expiration date

c) manufacturing logo and number d) b and c

13. What useful information is provided by nutritional traffic light labels on the products?

a) The amount of energy and fat b) The amount of salt and sugar c) Items a and b d) The amount of flavor and color of the product

Perceived barriers

Row	Items	I agree	No idea	I disagree
1	I don't have enough time to eat breakfast.			
2	I don't eat fruit because we don't have fruit at home.			
3	It's hard to bring a snack from home.			
4	If I eat bread and cheese, my classmates will make fun of me.			
5	I don't like to drink milk.			
6	Chips and cheese puffs are available and cheap.			

Perceived benefits

Row	Items	I agree	No idea	I disagree
1	If I eat breakfast, I will learn my lessons well.			
2	If I eat cheese sandwiches instead of sausage and ham sandwiches, I will be healthier.			
3	Eating fruit and juice makes me fresh.			
4	If I eat pistachios, almonds, or walnuts instead of chips and cheese puffs, I will be healthier.			
5	Consumption of milk, yogurt, or buttermilk makes my bones stronger.			