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# Assessing readiness to change in regular breakfast consumption among elementary students

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## Abstract:

**BACKGROUND:** Motivation and desire are the main psychological factors associated with regular breakfast consumption among elementary students. The purpose of this study was to assess the readiness of students to regular breakfast consumption.

**MATERIALS AND METHODS:** This research was cross-sectional study; 300 students participated who were selected based on cluster sampling from elementary schools in different parts of Ardabil and were interviewed using a motivational questionnaire according to SOC model. The acquired data was then analyzed by ANOVA and linear regression.

**RESULTS:** Cognitive processes of change such as social liberation ( $\beta = 0.31$ ,  $\alpha = 0.001$ ) and self-reevaluation ( $\beta = 0.13$ ,  $\alpha = 0.04$ ) and self-efficacy ( $\beta = 0.44$ ,  $\alpha = 0.001$ ) played a significant role in motivating students to move from the inactive stage to preparation stage.

**CONCLUSION:** By understanding the motivational factors of regular breakfast consumption, a regular program can be implemented to increase breakfast consumption and ensure the health of students and help them to grow in learning ability and abstract thinking.

## Keywords:

Meals, students, transtheoretical model

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## Introduction

Regular breakfast consumption in childhood period plays an important role in the development and intellectual maturity of children. Given that children learn health behaviors mainly by observation and with considering that the parental employment and their absence from home, as well as the presence of children in kindergartens and primary schools, it is necessary to carry out a fundamental plan to motivate and readiness children for regular breakfast consumption.<sup>[1]</sup>

Parents and teachers' workplace stresses sometimes not only do not increase children's motivation to eat breakfast but

also greatly reduce it.<sup>[2,3]</sup> Therefore, in order to prepare and motivate children to eat breakfast, parents should to set a certain time for breakfast before going to work to make the child feel more satisfied with the family and have more motivation to eat breakfast regularly.

According to Piaget's theory, children around the age of 11 should be able to achieve abstract thinking.<sup>[4]</sup> Hence, for the intellectual development of children, both the family and the school staffs must make great efforts. Proper nutrition is one of the most basic and essential conditions for the intellectual development and abstract thinking of elementary school children.<sup>[5]</sup>

People's food patterns are formed in childhood. Therefore, nutrition education

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and increasing the knowledge, awareness and healthy food choice of children to improve the diet pattern, can prevent many chronic problems and nutrition-related diseases in adulthood.<sup>[6,7]</sup>

Researches showed that students were less trend to eat breakfast before the start of courses, and between classes for snack time, a number of students were inclined to use fast food and junk food.<sup>[8-12]</sup>

Due to the fact that students are considered as health messengers, with proper education, their desire and motivation to eat regular breakfast and receive proper calories from this meal can be performed effectively.<sup>[13,14]</sup> Therefore, assessing readiness for regular breakfast consumption should be examined, and by determining the factors affecting the motivation for regular breakfast eating, more detailed programs should be prepared for their education.

One of the health education models that can be used to assess motivation of participants to apply healthy behavior, is the transtheoretical model (TTM). The TTM of behavior change is an integrative theory of therapy that assesses an individual's readiness to act on a new healthier behavior, and provides strategies, or processes of change (POCs) to guide the individual. The model is composed of constructs such as stages of change (SOCs), POCs, self-efficacy, and decisional balance.<sup>[15-18]</sup> Given that the foundation of a healthy status is established during growth period and breakfast is the most effective meal for growth and development, as well as students may be less inclined to eat breakfast due to the stress of school period, thus in this study, we decided that to determine the motivation of regular breakfast consumption among elementary schools in Ardabil city using the TTM Motivational Questionnaire.

## Materials and Methods

### Study design and setting

This cross-sectional study was conducted among 300 students aged 7-11 years, in Ardabil primary schools. We aimed to assess the readiness of children to regular breakfast consumption based on TTM questionnaire.

According to the department of education of Ardabil province, Ardabil city has two education districts with 292 public and nonprofit primary schools that are located in different parts of the city with different social and economic characteristics. The statistical population includes 7575 fourth-, fifth-, and sixth-grade students out of 292 primary schools in Ardabil, which includes 3745 male students and 3830 female students.

### Study participants and sampling

Cluster sampling method was used to select schools, and simple random sampling method was used to select students from each school.

Prior studies shows that 75% of the participants use regular breakfast consumption and eat healthy meals in schools,<sup>[19,20]</sup> we decide to use these values for  $P$  and  $q$  in Cochran's formula ( $p = 0.75$ ,  $q = 0.25$ ,  $\alpha = 0.95$ ,  $d = 0.05$ ). Ultimately, after calculating the 15% probability of sample loss, the sample size ( $n = 300$ ) was calculated.

$$n = \frac{Z^2 p (1-p)}{d^2}$$

Based on cluster sampling method, 10 schools (five schools in each district) were selected and 30 students were randomly selected from each school, with equal number from fourth to sixth grades. Finally, 300 students participated in the study after obtaining informed written consent from their parents or guardians. Inclusion criteria were parental satisfaction and studying at fourth to sixth grades. Third and lower grades were excluded from the study due to difficulty in understanding the motivational questions.

### Data collection tool and technique

After obtaining informed consent from participants, we started the motivational interview with TTM questionnaire. All interview sessions were conducted in the presence of a nutritionist and a school health education instructor. At the beginning of each motivational interview session, about 15 minutes of nutrition instruction was provided by a nutritionist using video slides for children about the benefits of eating breakfast and the nutritional value of the foods that should be eaten for breakfast. The questionnaire was completed by the children themselves before and after the nutrition education program.

Motivational interview was conducted using the TTM questionnaire. The questionnaire included SOC measure with 5 questions, decisional balance measure (pros and cons of eating breakfast) with 22 questions, self-efficacy measure (temptation versus self-efficacy) with 10 questions, and a POC measure including cognitive and behavioral processes with 24 questions.<sup>[11]</sup> The content validity of questionnaire was measured using content validity ratio (CVR) and content validity index (CVI) via an experts' panel including eight health education specialists and two epidemiologists. The validity of the questionnaires was confirmed by the CVI of 90%, 84%, 86%, and 90%, and CVR of 94%, 90%, 88.6%, and 86%, for SOC, decisional balance, self-efficacy, and POC scales, respectively. The final version of the questionnaire was

assessed with 40 elementary students using test–retest measurement. Spearman–Brown correlation coefficients to determine the test–retest reliability were 86.5%, 82% 78%, and 76%, for SOC, decisional balance, self-efficacy, and POC scales, respectively.

**Ethical consideration**

An informed consent form was obtained from all parents of students at the beginning of the study and they were assured that all their information would remain confidential. Ethic approval was obtained from the Ethics Committee of Ardabil University of Medical Sciences (IR.ARUMS.REC.1398.195).

After interviewing with students, data were entered into SPSS version 20 software and analyzed using ANOVA and linear regression tests. One-way ANOVA and linear regression analysis were performed to assess the readiness of elementary students to regular breakfast consumption.

**Results**

Analysis showed that cons (dissenting opinions on eating breakfast) subconstruct of decision balance had an effective role on eating breakfast. It has been an important factor in stopping students’ motivation to behavior change and stopped the study population in the inactive stages such as pre-contemplation and contemplation stage and preparation stage [Figure 1 and Table 1].

Analyzing the impact of cognitive POCs such as self-reevaluation and social liberation and self-efficacy and examining the effects of these components determined that these constructs are very effective in motivating behavior change and transitioning from the inactive stage to the preparation stage [Figure 2 and Table 2].

To motivate students to improve their SOC to act and maintenance stage, decision balance construct (decreasing of cons and increasing of pros score) and behavioral POC construct such as counterconditioning and reinforcement management subconstructs were very effective [Figure 3 and Table 3].

**Discussion**

One of the factors that can help the development of learning in children is proper nutrition, especially breakfast.<sup>[21]</sup> This study was conducted aimed to determine motivational factors of regular breakfast consumption among primary school students in Ardabil.

The results of the initial analysis showed that cons (opposite opinions on breakfast consumption)

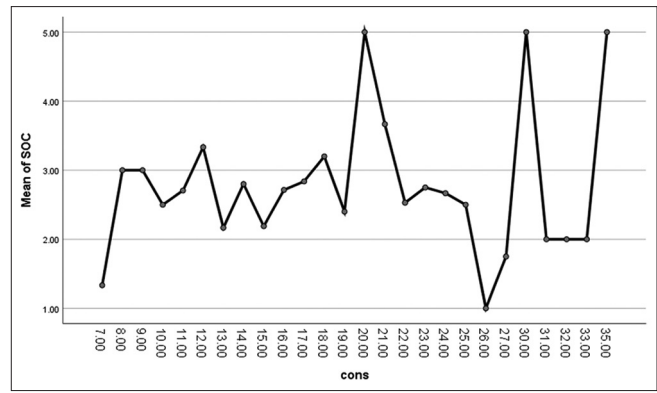


Figure 1: Effect of cons in stopping elementary students in inactive stages of breakfast consumption

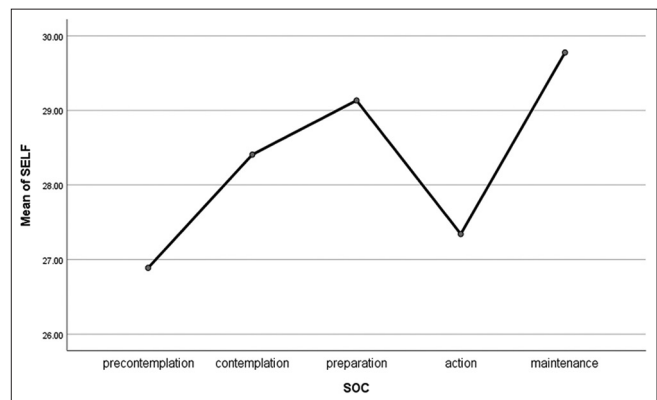


Figure 2: Effect of self-efficacy on readiness to change in breakfast eating

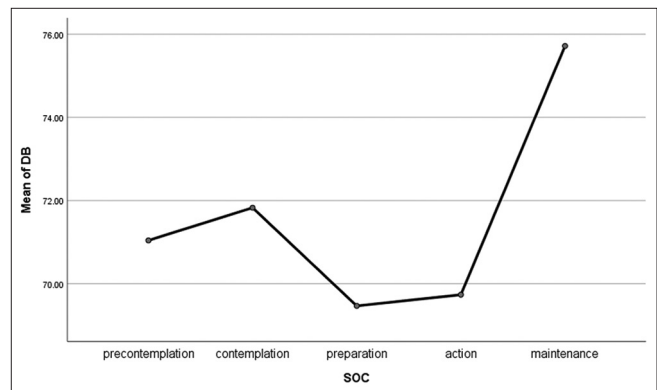


Figure 3: Effect of decision balance on readiness to change in breakfast eating

was a very strong factor in stopping the samples in the passive stages of precontemplation and contemplation. This results is consistent with other studies results<sup>[22,23]</sup> Therefore, one of the duties of teachers and parents of these students is to strengthen the pros (opinions that agree with the consumption of breakfast) and reduce the impact of cons in order to create the ground for stage transition in students.

Cognitive POC construct including self-reevaluation, social liberation and self-efficacy, were strongest

**Table 1: Stage of change of elementary school breakfast consumption**

Stage of change	Description	n	Mean	SD
Precontemplation	No intention to breakfast consumption in the future	72	16.32	5.6
Contemplation	Intention to breakfast consumption in the next 6 months	81	17.65	6.5
Preparation	Intention to breakfast consumption in the next 30 days	60	16.77	5.2
Action	Have routine breakfast plan	38	17.06	4.9
Maintenance	More than 6 months have regular breakfast plan	49	18.09	6.67
Total		300	17.15	5.92

SD=Standard deviation

**Table 2: Effect of cognitive process of change on readiness to change in breakfast consumption**

Cognitive process of change	β	t	Significance
Consciousness raising	0.08	1.360	0.17
Dramatic relief	-0.11	-1.576	0.11
Environmental reevaluation	0.09	1.489	0.13
Self-reevaluation	0.13	2.003	0.04
Social liberation	0.31	4.423	0.001

Dependent variable: SOC. SOC=Stage of change

**Table 3: Effect of behavioral process of change on readiness to change in breakfast consumption**

Behavioral process of change	β	t	Significance
Counterconditioning	0.19	2.313	0.02
Help relationship	0.07	1.023	0.30
Reinforcement management	0.18	2.32	0.02
Self-liberation	0.04	0.674	0.50
Stimulus control	0.06	0.808	0.42

Dependent variable: SOC. SOC=Stage of change

motivator to stage transition from inactive stages to preparation and readiness to change. this results consistent with other study.<sup>[24-27]</sup> While inconsistent with this studies.<sup>[16-18]</sup>

Behavioral POC construct including counterconditioning, Reinforcement management and decision balance constructs (decreasing cons score and increasing pros score) also played an important role in stage transition of students to action and maintenance stage.<sup>[28,29]</sup>

Therefore, it is recommended that teachers and school health nursing or community health nursing who works as health educators in schools should perform proper evidence-based nutrition education programs based on SOC of breakfast consumption and strongest motivators to eat regular breakfast in students.

### Conclusion

By understanding the motivational factors of regular breakfast consumption among primary school children such as decreasing cons and increasing pros score and cognitive POC such as self-reevaluation and social liberation, a regular program can be designed and implemented to increase breakfast consumption and ensure the health of students and help them to grow in

learning ability and abstract thinking. Self-efficacy along with behavioral POC such as reinforcement management and counterconditioning can be another motivator to stage promotion in this study.

### Study limitation

This research was limited by the reliance on self-report data. Participants in this research may have over-reported their actual rate of breakfast consumption. However, provide comfortable environment for students to complete the questionnaire was done completely during the interview. It is suggested that in future studies, the number of interview sessions, the duration of the sessions and the number of participants in the study be increased.

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### Conflicts of interest

There are no conflicts of interest.

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