The Effects of Multi-Component Nutrition Education on Nutrition Literacy and Nutrition Attitudes of University Students: A Randomized Controlled Experimental Study Protocol

Çok Bileşenli Beslenme Eğitiminin Üniversite Öğrencilerinin Beslenme Okuryazarlığı ve Beslenme Tutumlarına Etkisi: Randomize Kontrollü Deneysel Çalışma Protokolü

ABSTRACT

This paper is a study protocol designed to investigate the effects of multi-component nutrition education based on Integrated Health Literacy Model on nutrition literacy and nutrition attitudes of university students. The study was planned as a pre-test-post-test randomized controlled experimental study. Population of the study will consist of students who were attending Yozgat Bozok University, Faculty of Education during the 2021 and 2022 Academic Year and who met the inclusion criteria. Sample of the study was calculated as at least 26 individuals for each group with 95% confidence (1-α), 80% test power (1-β) and d=0,8 effect size with the power analysis conducted. Considering that there may be data loss, 15% more of this number (experimental group:32, control group:32) will be included. The data will be collected with Personal Information Form, Evaluation Instrument of Nutrition Literacy on Adults (EINLA) and Attitude Scale for Healthy Nutrition (ASHN). The data will be analysed with IBM SPSS 28 program by using independent groups t test, Mann Whitney U test. Dependent groups t test and Wilcoxon tests will be used in intragroup comparisons. Correlation analysis will be conducted to determine the correlation between scores obtained from measurement instruments. This pre-test-post-test randomized controlled study was registered to the Clinical Trials Registry and Results System with the number NCT05681117.The present study is a study protocol for a pre-test-post-test randomized controlled experimental study. The results will be explained after the study data are analysed. The effects of multi component nutrition education on nutrition literacy and nutritional attitudes of university students will be evaluated.

Keywords: Nutrition, Nutrition Literacy, Healthy Nutrition, University Students

ÖZET

Bu makale Entegre Sağlık Okuryazarlığı Model'ine göre düzenlenen çok bileşenli beslenme eğitiminin üniversite öğrencilerinin beslenme okuryazarlığına ve beslenme tutumlarına etkilerini araştırmak amacıyla düzenlenmiş bir çalışma protokolüdür. Araştırma ön test-son test randomize kontrollü deneysel bir çalışma olarak planlanmıştır. Araştırmanın evrenini; Yozgat Bozok Üniversitesi Eğitim Fakültesi'nde 2021-2022 Eğitim-Öğretim Yılı'nda öğrenimine devam eden öğrenciler arasından uygunluk kriterlerine göre seçilen ve çalışmaya katılmayı kabul eden öğrenciler oluşturacaktır. Araştırmanın örneklemi yapılan güç analizinde %95 güven (1-α), %80 test gücü (1-β) ve d=0,8 etki büyüklüğü ile her bir grup için en az 26 kişi olarak hesaplanmıştır. Veri kayıpları olabileceği düşünüldüğünden bu sayının %15 fazlası (deney:32, kontrol:32) alınacaktır. Veriler kişisel bilgi formu, Yetişkinlerde Beslenme Okuryazarlığı Değerlendirme Aracı (YBOYDA) ve Sağlıklı Beslenmeye ilişkin Tutum Ölçeği (SBİTÖ) ile toplanacaktır. Veriler IBM SPSS 28 programı ile bağımsız gruplar t testi, Mann Whitney U testi ile analiz edilecektir. Grup içi karşılaştırmada bağımlı gruplar t testi ve Wilcoxon testleri kullanılacaktır. Ölçüm araçlarından alınan puanlar arasındaki ilişkinin belirlenmesinde ise korelasyon analizi yapılacaktır. Bu ön test-son test randomize kontrollü çalışma Clinical Trials Protokol kayıt ve sonuç sistemine NCT05681117 numarası ile kaydedilmiştir. Bu çalışma, ön test-son test randomize kontrollü deneysel çalışma için çalışma protokolüdür. Çalışma verileri analiz edildikten sonra bulgular açıklanacaktır. Çok bileşenli beslenme eğitiminin üniversite öğrencilerinin beslenme okuryazarlığı ve beslenme tutumları üzerine etkisi değerlendirilecektir.

Anahtar Kelimeler: Beslenme, Beslenme Okuryazarlığı, Sağlıklı Beslenme, Üniversite Öğrencileri

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INTRODUCTION

Youth is defined by World Health Organization (WHO) as the period covering the age range of '10-24'. This period is a critical period that also includes adolescence, which is the first stage of transition from childhood to adulthood (WHO, 2017). Health behaviours of young adults (18-24 years of age) who spend this period as university students form the basis of health in their future lives (Nola, Carolyn and Parsons, 2015; Ermiş et al.,

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2015). University years is a period in which most of the students are separated from their families, they become involved in a new culture and start to act independently (Ortega et al., 2013). University students, who are also more independent in their food choices, can gain unhealthy eating behaviours as a result of this (Yetgin and Agopyan, 2017). Unhealthy eating behaviour is one of the basic causes of many chronic diseases such as obesity, heart diseases, diabetes and hypertension during adulthood (Ministry of Health, 2019).

Factors such as place of residence, dormitory conditions, friend circle, stress, economic situation and access to food affect eating behaviours in university students who switch from family diet to individual diet (Deliens et al., 2014). Another important factor that affects healthy eating behaviours of individuals is health literacy (Mahan and Raymond, 2019). Health literacy (HL) has been defined as *"social and cognitive skills that determine the motivation and skills of individuals to access and understand information about health and to use this information to promote their health"* by WHO (WHO, 1998). Health behaviours of individuals differ depending on the level of health literacy. Low HL level is one of the main barriers to healthy eating and maintaining good health because health literacy affects all self-care behaviours, as well as the individuals' choice of food, portion control and therefore healthy eating status (Velardo, 2015). Low level of health literacy is one of the main reasons why individuals make riskier eating dietary choices (WHO, 2013).

Until recently, health literacy has been addressed mostly in terms of medical literacy and has been evaluated in terms of outputs such as managing the disease and compliance with treatment. However, it is important to evaluate health literacy in terms of its health promoting aspect. In this respect, it has been stated that there is a need for a health literacy model that includes health promotion dimension and medicine and public health approaches and the Integrated Health Literacy Model has been created (Sorensen et al., 2012). This model was created in a systematic review that analysed 17 definitions and 12 conceptual dimensions of health literacy. Three areas were determined in health processes with this conceptual model. These areas are health service delivery, disease prevention and health promotion. Four areas were determined in information processing processes. These areas are accessing information, understanding information, evaluating information and applying information and a matrix of 12-dimension health literacy has been defined. Basic antecedents, main components and results of the model are shown below (Sorensen et al., 2012).
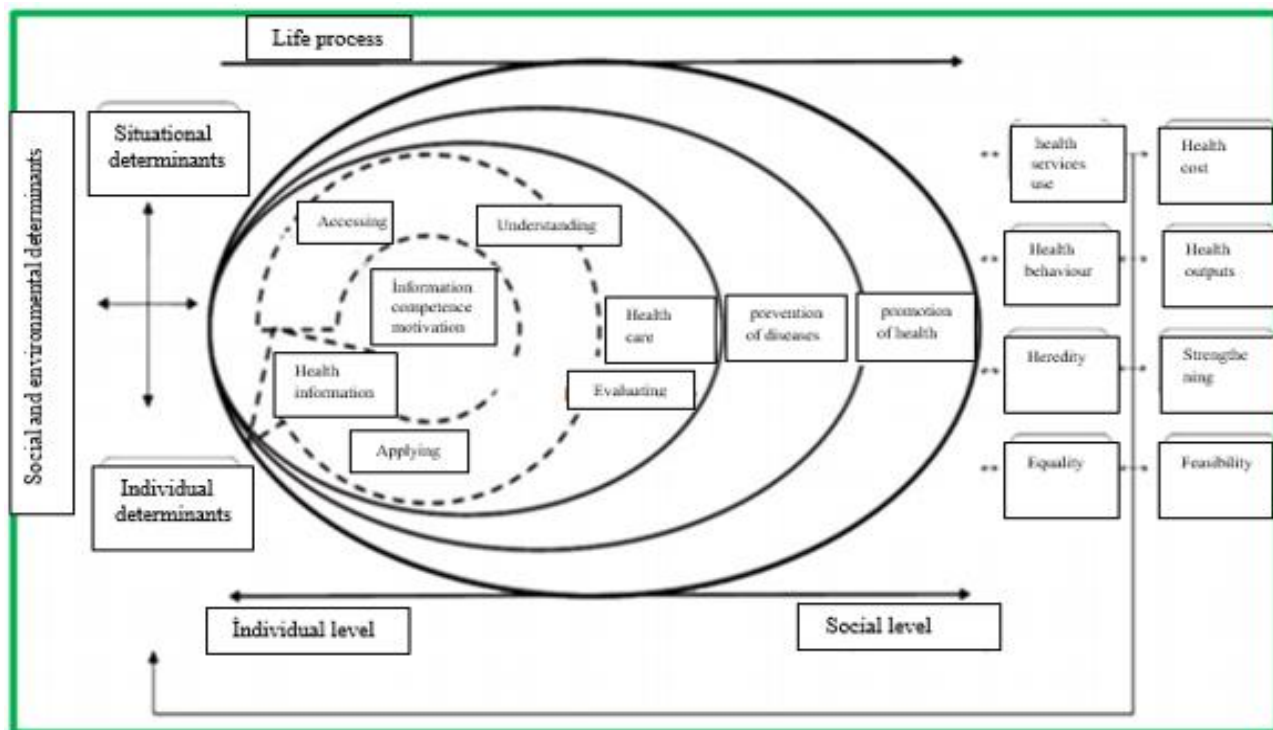

Figure 1: Integrated Health Literacy Model (Sorensen et al., 2012).

Nutrition literacy, which is one of the important components of health literacy, is defined as *"having the ability to understand, interpret and access information about essential services and basic nutrition information to make appropriate nutrition decisions"* (Velardo, 2015). Increasing nutritional literacy is possible with nutrition education programs. While there are various nutrition education programs, the effectiveness of nutrition education, which is mostly based on classical education, on healthy eating attitudes are still uncertain (Can and Şahin-Kaya, 2022). For this reason, multi-component interventions-trainings to increase knowledge and nutrition skills about healthy food should be organized and the skills of making healthy food choices should be developed in different age groups,

genders and socioeconomic groups (WHO, 2020). In this context, it is aimed for nutrition education to have a multi-component structure and to include the practice step with the thought that practice is also important as well as knowledge. With this purpose, it was considered as suitable to add "supermarket tour with discussion" to the education intervention in our study. The presence of a multi-component education content constitutes the original aspect of the study.

Hypotheses

H1.1: There is a difference between the nutritional literacy levels of students who have received multi-component nutritional education and the nutritional literacy levels of students who have not.

H2.1: There is a difference between the nutritional attitudes of students who have received multi-component nutritional education and the nutritional attitudes of students who have not.

MATERIAL AND METHOD

Research Protocol

This study protocol describes the pre-test-post-test randomized controlled experimental design conducted at Yozgat Bozok University. The study protocol was prepared in accordance with CONSORT (Consolidated Standards of Reporting Trials) (Sunay, 2013). The study is planned to be carried out between November 2021 and February 2023.

Research Population and Sample

Population of the study will consist of students who were attending Yozgat Bozok University, Faculty of Education during the 2021 and 2022 Academic Year and who met the inclusion criteria. Sample of the study is calculated as at least 26 individuals for each group with 95% confidence (1-α), 80% test power (1-β) and d=0,8 effect size with the power analysis conducted. Considering that there may be data loss, 15% more of this number (experimental group:32, control group:32) will be included (Akın and Koçoğlu, 2017). The students included in the study will be assigned to experimental and control groups with stratified randomization method.

Inclusion Criteria:

✓ Being a student at Yozgat Bozok University, Faculty of Education,
✓ Volunteering to participate in the study,
✓ Having an insufficient (between 0 and 11 points) or borderline (between 12 and 23 points) nutritional literacy level according to Evaluation instrument of nutrition literacy on adults (EINLA).

Exclusion Criteria:

✓ Having a sufficient (between 24 and 35 points) nutritional literacy level according to EINLA,
✓ Living with the family,
✓ Having a chronic (diabetes, hypertension, hyperthyroid, anaemia, osteoporosis, digestive system disease such as celiac),
✓ Being a foreign student.

Randomization

In order to provide homogeneity between the groups, strata will be formed by considering gender and HL levels. The students will be grouped in two strata according to gender (female, male) and HL levels (insufficient between 0 and 11 points, borderline between 12 and 23 points). It will be determined by the coin toss method before assigning groups to experimental or control group and the groups will be called zero and one. A random number sequence will be created in the computer environment by an independent biostatistician who does not know about the groups and the students will be assigned to experimental (n:32) and control (n:32) groups with simple randomization method.

Blinding

Since the study includes an educational intervention, it will not be possible to blind the intervention group or the researcher. In order to avoid bias, the researcher will start the application after the experimental and control groups are assigned by an independent statistician. The study data will be collected by an assistant researcher who is trained by the researcher and who does not know the groups and they will be entered in the SPSS program. Statistics of the study will be performed by an independent statistician who does not know about the groups and the researcher will learn which data belong to which group after the data and the discussion are written with group codes.

Data Collection Tools

The data will be collected with Personal Information Form, Evaluation instrument of nutrition literacy on adults (EINLA) and Attitude Scale for Healthy Nutrition (ASHN).

Personal Information Form

Personal Information Form was prepared by the researcher in accordance with the proximal (close) and distal (far) determinants of the Integrated HL Model. The first part of the form consists of the individual (age, gender, race, socioeconomic condition, education, profession, employment, income) and situational (social support, family and peer influence, media, physical environment) determinants, which are the proximal determinants of the model. The second part of the form consists of social and environmental determinants (demographic situation, culture, language, political powers, social systems), which are the distal determinants of the model. Personal Information Form has a total of 28 questions.

Evaluation Instrument of Nutrition Literacy on Adults (EINLA)

It was developed as a tool to evaluate nutrition literacy levels of adults by Cesur, Koçoğlu and Sümer (2015) and its validity and reliability study was conducted. The multiple choice scale with four options consists of five factors and 35 questions. A total score between 0 and 11 is classified as insufficient, a total score between 12 and 23 is classified as borderline and a total score between 24 and 35 is classified as sufficient level of nutrition literacy (Cesur, Koçoğlu and Sümer 2015).

Attitude Scale for Healthy Nutrition (ASHN)

Attitude Scale for Healthy Nutrition was developed by Tekkurşun and Cicioğlu in 2018 and validity and reliability study was conducted. Minimum possible score from ASHN is 21, while the maximum possible score is 105. A score of 21 indicates very low healthy nutrition attitudes, a score between 23 and 42 indicates low level of healthy nutrition attitudes, a score between 43 and 63 indicates moderate level of healthy nutrition attitudes, a score between 64 and 84 indicates high level of healthy nutrition attitudes and a score between 85 and 110 indicates ideally high level of nutrition attitudes (Tekkurşun and Cicioğlu, 2019).

Interventions

Control Group

Control group will not receive any interventions. After follow-up test data are collected from the control group, they will be given leaflets prepared by the researcher.

Experimental Group

4 interventions will be performed on the experimental group as multi-component education intervention. These interventions are;

1. Classroom Based Nutrition Education: Basic methods that will be used in classroom-based nutrition education are presentation (information transfer, question-answer, discussion), brain storming, concept map method, fishbone method, case discussion and demonstration method. The content of classroom-based nutrition education organized according to integrated health literacy model components are shown below.

Table 1: Class-based Nutrition Education Organized according to the Components of the İntegrated Health Literacy Model

INTEGRATED HL MODEL COMPONENTS	MAIN GOAL	MODULES
Accessing information about health	Accessing information about nutrition	MODULE 1 -Basic information about nutrition and accessing this information
Understanding information about health	Understanding information about nutrition	MODULE 2 -Understanding information about healthy nutrition
Evaluating information about health	**Evaluating** information about nutrition	MODULE 3 - Evaluating information about nutrition
Applying information about health	**Applying** information about nutrition	MODULE 4 -Reading food labels- Application

2. Online Intervention (SMS reminders including clues about healthy nutrition): SMS reminders containing healthy eating tips will be sent to the participants during the education (four weeks), twice a week, once during the week and once at the weekend, starting with the nutrition education.

3. Distribution of Leaflets Prepared in accordance with Education Content: Leaflets prepared in accordance with classroom-based nutrition education content will be distributed at the end of the module educations.

4. Supermarket Tour with Discussion: A supermarket tour with discussion will be held in a corporate supermarket in Bozok University Campus with the students who have completed their classroom nutrition education. In this tour, an activity for reading food labels in order to gain the ability to evaluate the content of products is planned. Before this activity, a guideline for a tour activity with discussions will be prepared by the researcher and the tour will be made within the scope of this guideline. In the food label reading activity, unhealthy industrial products and labels for one product from each group have been determined. These products will be distributed to students and the students will be asked to evaluate the label content. Missing important points will be highlighted by the researcher.

Multi-component nutrition education will be prepared in line with the current literature and presented to the opinions of experts in the field (3 faculty members in public health nursing, 3 faculty members in nutrition and dietetics, 3 faculty members in educational sciences and two clinical dietitians) in terms of content.

Post-data will be collected from both groups in the first month following the application, SMS application will be applied to the experimental group again in the third month and no interventions will be made on the control group. In order to evaluate the efficiency of the multi-component nutrition education activity provided, follow-up tests will be collected from both groups and the application will be completed.

Application Process Of The Study
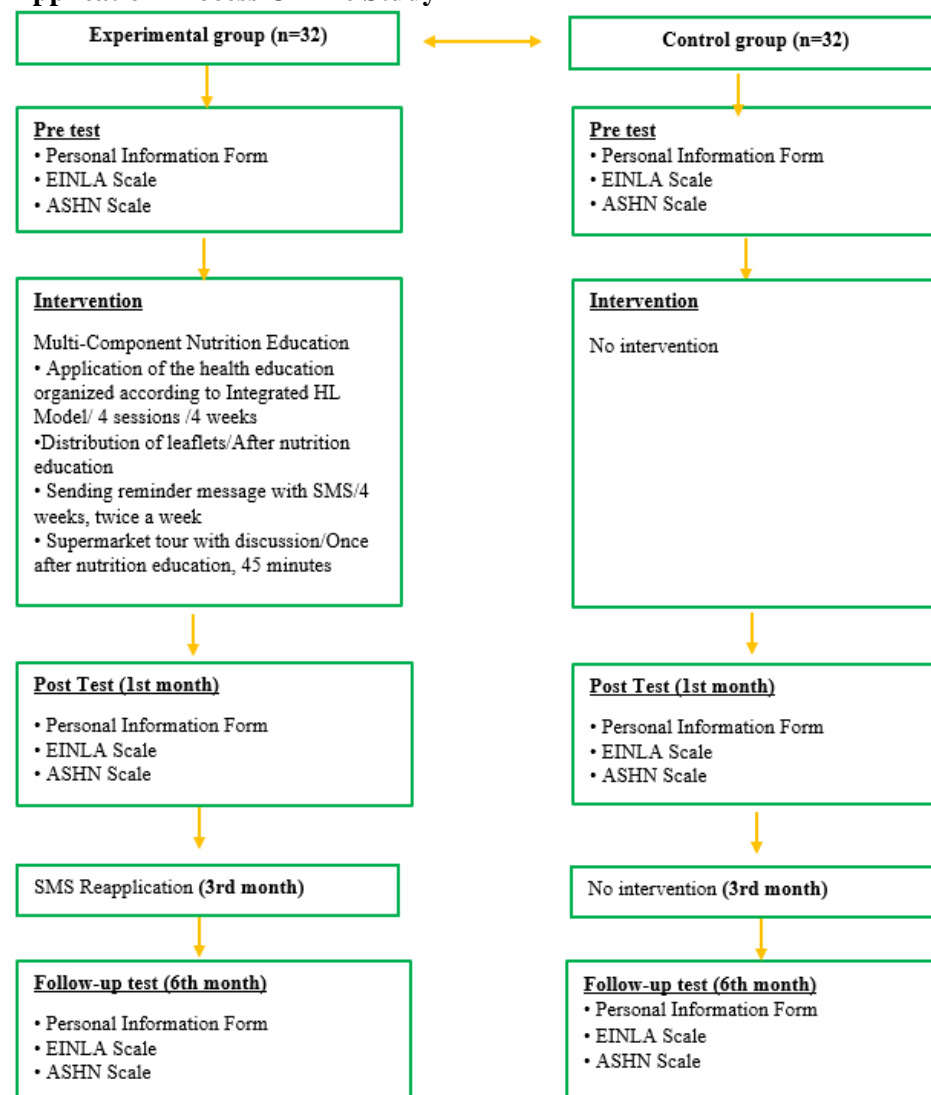
Statistical Analysis

Independent groups T test or its non-parametric equivalent Mann Whitney U test will be applied in the comparison between groups according to whether the data are normally distributed. Dependent groups T test or its non-

parametric equivalent Wilcoxon test will be used in intragroup comparisons. Correlation analysis will be used to determine the correlations between the scores obtained from measurement instruments.

RESULTS

The present study is a study protocol for a pre-test-post-test randomized controlled experimental study. The results will be explained after the study data are analysed.

DISCUSSION AND CONCLUSION

It is predicted that the multi-component nutrition education protocol developed for university students will have positive effects on students' nutrition literacy and healthy eating attitudes. This pre-test-post-test randomized controlled study will provide a guideline as evidence to nutrition education programs that will be developed outside traditional nutrition education.

ETHICAL ASPECTS

Ethics Committee Approval: The study was conducted with the permission of Yozgat Bozok University Ethics Committee (Date: 12.11.2021, Decision Number: 27/19).

Conflict of Interest Statements: Authors do not have any conflict of interest to declare.

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