

# The Effect of Educational Video-Based Intervention on Nutrition and Physical Activity in High School Students on Healthy Lifestyle Behaviors: A Randomized Controlled Trial

## Lise Öğrencilerinde Beslenme ve Fiziksel Aktivite Konulu Eğitici Video Tabanlı Müdahalenin Sağlıklı Yaşam Tarzına Etkisi: Randomize Kontrollü Bir Çalışma

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**ABSTRACT Objective:** The aim of this randomized controlled trial is to determine the effect of using healthy lifestyle promoting films, documentaries and videos on healthy life behaviors in health high school students. **Material and Methods:** The population of the study consists of 194 students who attended a vocational and technical Anatolian high school in the tenth, eleventh, twelfth grade. The intervention group of the study consists of 100 students and the control group consists of 94 students. Socio-demographic data form and Healthy Lifestyle Behavior Scale-II pre-test were applied to the intervention group before the videos, and post-test was applied 3 months later. In the control group, the same questionnaires were applied as a pre-test and after 3 months, post-test was applied without any videos being watched. **Results:** In the 11<sup>th</sup> grade intervention group, there was a significant difference between the pretest and posttest mean scores compared to the control group ( $p=0.003$ ). In both genders, there was a significant difference between the mean scores of the scale in the nutrition and health responsibility subscales of the intervention group compared to the control group ( $p=0.001$ ). The intervention group scored significantly higher than the interpersonal relationship subscale of the scale compared to the control group ( $p=0.001$ ). **Conclusion:** Videos were found to be more effective in the 11<sup>th</sup> grade. It was found that watching instructional videos was effective in developing healthy eating habits.

**ÖZET Amaç:** Bu randomize kontrollü çalışmanın amacı, sağlık meslek lisesinde öğrenim gören öğrencilerde sağlıklı yaşamı teşvik edici film, belgesel ve videolar kullanmanın sağlıklı yaşam biçimi davranışları üzerine etkisini belirlemektir. **Gereç ve Yöntemler:** Bu çalışmanın örneklemini bir mesleki ve teknik Anadolu lisesinde öğrenim gören, 194 10-11-12. sınıf öğrencisi oluşturmuştur. Müdahale grubu 100, kontrol grubu ise 94 öğrencidir. Müdahale grubuna videolardan önce sosyodemografik veri formu ve Sağlıklı Yaşam Biçimi Davranışları Ölçeği-II ön-test uygulanıp, 3 ay sonra ise son-test uygulanmıştır. Kontrol grubuna ise aynı anketler ön-test olarak uygulanıp, hiçbir video izlenmeden, 3 ay sonra son-test uygulanmıştır. **Bulgular:** On birinci sınıf müdahale grubunda kontrol grubuna göre ön-test ve son-test puan ortalamaları arasında anlamlı fark vardır ( $p=0.003$ ). İki cinsiyette de ölçeğin beslenme ve sağlık sorumluluğu alt ölçeklerinde müdahale grubunun, kontrol grubuna göre puan ortalamaları arasında anlamlı fark vardır ( $p=0.001$ ). Müdahale grubu, kontrol grubuna göre ölçeğin kişiler arası ilişki alt ölçeğinden anlamlı düzeyde yüksek puan almıştır ( $p=0.001$ ). **Sonuç:** Videoların 11. sınıflarda daha etkili olduğu görülmüştür. Sağlıklı beslenme alışkanlığının geliştirilmesinde ve sağlık sorumluluğu kazandırılmasında izlenen eğitici videoların yararlı olduğu görülmüştür.

**Keywords:** Health promotion; healthy lifestyle behaviors; educational videos and films; high school students; adolescent

**Anahtar Kelimeler:** Sağlığı geliştirme; sağlıklı yaşam biçimi davranışları; eğitici video ve filmler; lise öğrencileri; adölesan

Unhealthy behaviors are the leading cause for the burden of cardiovascular diseases, cancers,

chronic respiratory diseases, and mental and substances use disorders. An important target group for

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a healthy lifestyle and nutrition is high school age adolescents.<sup>1,2</sup>

Adolescent's health-related attitudes and behaviors affect his/her family and society as well as his/her own.<sup>3</sup> The most common health problems during this period are inadequate physical activity, inadequate and unbalanced diet.<sup>4</sup> It is not only the responsibility of the individual but also of the health personnel to make efforts to improve health.<sup>5</sup> College students are at a critical transition period for the development of health-related behavior.<sup>6</sup> Developing healthy lifestyle behaviors in nutrition and physical activity positively improves adolescent health.<sup>7</sup> Several studies (6-9) reported a relatively high prevalence of multiple risky health behaviors among college students, such as binge drinking, excessive screen time, skipping breakfast, and insufficient physical activity or fruit/vegetable intake, which might have detrimental effects on their physical and mental health. Thus, behavioral education intervention targeting at college students is warranted.<sup>8</sup> However, previous studies suggested limited effectiveness of health education programs on college students' health behaviors, possibly due to different intervention modalities and intervention methods.<sup>9-12</sup>

Furthermore, general trends in development are modified by interactions between unique aspects of the child and his/her classroom contexts. As a result, children have individual needs and trajectories that require differentiated instruction and supports to enable optimal growth in competence, confidence, and motivation.<sup>13</sup> It was found that the use of visual and auditory tools and equipment was effective in achieving behavior change in school.<sup>14</sup> Visual and auditory materials not only provide a positive learning environment, but can also positively enhance the process of qualitative learning.<sup>15,16</sup> Audio and visual materials provide opportunities for multiple learning and also facilitate the remembrance of the knowledge taught.<sup>17</sup> When educational tools are used correctly and in place, it enables students to participate in the learning process and can help make behavior change permanent.<sup>18</sup> Tuong's systemic review showed that, compared to other educational media, video interventions were variably effective for modifying health behaviors depending on the target behaviors to be influenced.<sup>19</sup> The aim of this study is to determine the effect of using healthy

lifestyle promoting films, documentaries and videos on healthy lifestyle behaviors of health high school students. The hypothesis of the study is that educational and documentary films used by school nurses in school health services increases their Healthy Lifestyle Behavior Scale scores.

## MATERIAL AND METHODS

This randomized controlled trial was conducted at Taşköprü Vocational and Technical Anatolian High School in Taşköprü District of Kastamonu province in the 2017-2018 academic year. The school consists of health area students only ninth graders were not included in the study because we did not have a choice of control groups.

## POPULATION AND SAMPLING

The population of the study consists of 194 students who attended Taşköprü Vocational and technical Anatolian High School in the tenth, eleventh, twelfth grade in the 2017-2018 academic year. The intervention group of the study consists of 100 students and the control group consists of 94 students. Sample sizes were calculated by the total number of students in the classes selected by lot for the experimental and control groups.

There are two branches in each class. A total of three intervention groups of three control groups have been formed by choosing randomly one branch intervention and one branch control from each class. In order not to affect the experimental and control group students from each other, the experimental and control group classes were separated by class randomization method.

The dependent variable of the research is the HLSB-II score. Independent variables are gender, class, body mass index (BMI). Inclusion criteria were attending to high school 10-11-12, studying in the classroom and being a health student. Exclusion criteria were being 9<sup>th</sup> grade and not having family permission to participate in the study.

## ETHICAL CONSIDERATION

Before the study, a permission dated 20/10/2017 with the protocol number 75048956-44-E. 17308389 was

taken from the Clinical Research Board of Ethics of Bülent Ecevit University. Each student and parent were informed about the study and parents' permission was obtained because the students were under 18. Permission was obtained from the Provincial Directorate of National Education of Kastamonu.

#### DATA COLLECTION TOOLS

In this study, socio-demographic data form, HLSB-II were used. A total of 11 items of socio-demographic data form were used to determine the socio-demographic characteristics of the students. HLSB-II was developed by Pender in 1987, the scale was renewed in 1996 and named the HLSB-II scale.<sup>20</sup> Spring conducted the validity and reliability study of the scale in Turkey.<sup>21</sup> This scale, which consists of a total of 52 items, has 6 subgroups. These subgroups are health responsibility, spiritual development, physical activity, interpersonal relationships, nutrition, and stress management. The lowest score is 52 and the highest score is 208 on the HLSB-II.

In this study, the Cronbach alpha value of the HLSB-II scale was found to be 87.6.

#### INTERVENTION

In this study, the intervention group was shown a 35-minute documentary called "sugar coated", which contains the negative effects of carbohydrate-weighted unhealthy and unbalanced eating. A 90-minute educational video was also shown on another day of physical activity by the Ministry of Health to promote positive health behaviors. The control group was not shown any educational videos or movies. Socio-demographic data form and HLSB-II scale

were applied to both groups at the beginning of the study. Six months after the intervention, the HLSB-II scale was again applied to both groups.

#### STATISTICAL ANALYSIS

Data was analyzed using the Statistical Package for Social Sciences (SPSS) 16.0 program. Data were tested for normality by calculating skewness and kurtosis. Data were analyzed using percentages, mean values, standard deviation, chi-square test, and repeated measurements test.

#### RESULTS

In this study, 121 (62.4%) were girls and 73 (37.6%) were boys. The average age of the students was  $17.0 \pm 0.81$ . One hundred (51.5%) of the students were in intervention and 94 (48.5%) were in control group (Table 1). The distribution of groups according to the gender and the classes is given in Table 1.

According to the gender of intervention and control group of students, the score averages before HLSB-II and after HLSB-II are given in Table 2.

In the intervention group, nutrition and stress management, the HLSB-II total scores, mean of the boys and girls repeated six months after the intervention are found to be significantly higher in intervention group than the control group ( $p=0.001$ ). There was no significant increase among mean of other HLSB-II score according to the gender of the students in the control group ( $p>0.05$ ).

According to their class, the mean of scores of the intervention and control group of students from the

**TABLE 1:** Distribution of groups by gender and grade of students (n=194).

| *Gender      | Intervention |               | Control   |               | Total      |                |
|--------------|--------------|---------------|-----------|---------------|------------|----------------|
|              | n            | (%)           | n         | (%)           | n          | (%)            |
| Female       | 38           | (52.1)        | 35        | (47.9)        | 72         | (37.6)         |
| Male         | 62           | (51.2)        | 5         | (48.8)        | 121        | (62.4)         |
| *Grade       |              |               |           |               |            |                |
| 10.          | 32           | (47.8)        | 29        | (52.2)        | 61         | (31.4)         |
| 11.          | 33           | (49.3)        | 34        | (50.7)        | 67         | (34.5)         |
| 12.          | 35           | (53.0)        | 31        | (47.0)        | 72         | (37.1)         |
| <b>Group</b> | <b>100</b>   | <b>(51.5)</b> | <b>94</b> | <b>(48.5)</b> | <b>194</b> | <b>(100.0)</b> |

Gender chi-square: 1.35; Class chi-square: 1.27; \* $p>0.05$ .

**TABLE 2:** Mean of the subscale score before and after Healthy Life Style Behavior Scale-II intervention by gender of intervention and control group students-II.

| HLSB-II subscales     | Girls            |                     | Boys             |                     |
|-----------------------|------------------|---------------------|------------------|---------------------|
|                       | Pre-intervention | After intervention  | Pre-intervention | After intervention  |
|                       | Mean±SD          | Mean±SD             | Mean±SD          | Mean±SD             |
| Nutrition             | 19.4±3.07        | <b>22.1±4.21*</b>   | 19.7±4.14        | <b>21.6±3.71*</b>   |
| Physical activity     | 16.2±4.05        | 17.8±17.74          | 18.8±5.00        | 19.3±14.32          |
| Spiritualism          | 27.8±4.89        | 29.3±3.37           | 27.8±3.70        | 27.2±4.31           |
| Relations             | 24.2±3.70        | 26.3±4.21           | 23.2±4.21        | 25.1±4.71           |
| Stress management     | 18.8±3.55        | 20.6±4.40           | 18.6±3.74        | 20.1±4.32           |
| Health responsibility | 19.1±3.69        | <b>21.0±20.56*</b>  | 18.3±4.45        | <b>20.3±17.65*</b>  |
| <b>Total</b>          | 126.3±16.39      | <b>131.4±18.32*</b> | 128.2±12.37      | <b>140.9±14.40*</b> |

Women repeated measurements test (RMT): 5.48; Men RMT: 6.22.  
 HLSB-II: Healthy Life Style Behavior Scale-II; SD: Standard deviation; \*p<0.001.

HLSB-II subscales before and after the intervention were given in Table 3. There is no significant difference between HLSB-II score averages measured at the beginning and after the study among control group of grade 10 students (p>0.05).

Stress management, health responsibility and total HLSB-II scores of intervention group students were found to be significantly higher 6 months after intervention of grade 11 (p=0.003). There is no significant difference among other HLSB-II score averages measured at the beginning and after the study among control group of grade 11 students (p>0.05). While in grade 12, all score means increased significantly from the HLSB-II subscales of the intervention group students (p=0.001) in the control group, there was no significant increase in the score averages from any subscale of HLSB-II (p>0.05). In score

means of dimension of Spiritualism, there is no difference between the intervention and control groups of any class (p>0.05). In grade 10 and 11, there was no significant increase in the score means from any subscale of HLSB-II between control and intervention group students (p>0.05).

In the less weight students, there was no significant increase in the score averages from any subscale of HLSB-II between control and intervention group students (p>0.05).

In the normal weight students, nutrition and total scores were found to be significantly higher six months after of intervention groups than control groups (p=0.001). There was no significant increase in the score averages from other subscale of HLSB-II between control and intervention group students (p>0.05).

**TABLE 3:** Healthy Life Style Behavior Scale-II subscale score averages before and after intervention in intervention and control group students.

| HLSB-II subscales     | Grade 10         |                    | Grade 11         |                     | Grade 12         |                     |
|-----------------------|------------------|--------------------|------------------|---------------------|------------------|---------------------|
|                       | Pre-intervention | After intervention | Pre-intervention | After intervention  | Pre-intervention | After intervention  |
|                       | Mean±SD          | Mean±SD            | Mean±SD          | Mean±SD             | Mean±SD          | Mean±SD             |
| Nutrition             | 19.1±3.69        | 19.3±3.31          | 20.2±3.12        | 21.8±3.34           | 19.2±4.68        | <b>24.5±3.86*</b>   |
| Physical activity     | 17.4±5.34        | 17.3±6.02          | 18.2±5.07        | 19.1±5.93           | 15.9±3.71        | <b>18.6±3.79*</b>   |
| Spiritualism          | 27.2±4.34        | 28.8±5.03          | 27.6±3.60        | 29.8±4.94           | 28.1±4.66        | 28.0±3.99           |
| Relations             | 23.1±3.80        | 25.2±4.59          | 24.8±4.37        | 25.6±4.01           | 23.26±4.05       | <b>27.0±3.61*</b>   |
| Stress management     | 17.9±2.99        | 18.8±3.77          | 19.5±3.55        | <b>23.3±3.15*</b>   | 18.6±3.45        | <b>21.9±3.36*</b>   |
| Health responsibility | 17.6±3.88        | 18.0±4.57          | 19.2±4.66        | <b>21.31±4.21*</b>  | 19.0±4.45        | <b>22.2±4.15*</b>   |
| <b>Total</b>          | 124.1±16.68      | 126.4±20.21        | 131.8±12.37      | <b>135.7±15.50*</b> | 131.8±17.29      | <b>142.3±17.21*</b> |

RMT Class 10:1.42; RMT Class 11: 3.76; RMT Class 12: 4.98.  
 HLSB-II: Healthy Life Style Behavior Scale-II; SD: Standard deviation; RMT: Repeated measurements test; \*p<0.001.

**TABLE 4:** Subscale Score Means of Healthy Life Style Behavior Scale-II of intervention and control group of the students before and after intervention according to body mass index groups.

| HLSB-II subscales     | Less weight        |                    | Normal weight      |                     | Over weight-obese  |                     |
|-----------------------|--------------------|--------------------|--------------------|---------------------|--------------------|---------------------|
|                       | Pre-intervention   | After intervention | Pre-intervention   | After intervention  | Pre-intervention   | After intervention  |
|                       | Mean±SD            | Mean±SD            | Mean±SD            | Mean±SD             | Mean±SD            | Mean±SD             |
| Nutrition             | 19.8±3.45          | 20.0±3.22          | 18.9±3.52          | <b>22.2±3.29*</b>   | 19.2±4.27          | <b>23.5±3.46*</b>   |
| Physical activity     | 16.2±5.29          | 16.9±4.385         | 18.5±4.48          | 18.6±5.18           | 17.6±3.29          | <b>19.9±3.37*</b>   |
| Spiritualism          | 27.5±4.35          | 26.1±4.49          | 27.6±3.52          | 27.9±4.04           | 27.8±4.42          | 28.0±3.86           |
| Relations             | 23.3±4.02          | 24.9±3.63          | 23.9±4.23          | 24.8±4.36           | 23.3±4.63          | <b>27.5±3.23*</b>   |
| Stress management     | 17.9±3.09          | 19.4±3.21          | 18.8±3.29          | 20.6±3.19           | 18.9±3.28          | 20.6±3.41           |
| Health Responsibility | 17.9±3.76          | 18.9±4.42          | 19.2±4.48          | 20.9±4.41           | 19.8±4.37          | <b>22.23±4.27*</b>  |
| <b>Total</b>          | <b>122.9±16.85</b> | <b>126.3±19.21</b> | <b>127.8±12.19</b> | <b>136.7±13.89*</b> | <b>127.3±17.29</b> | <b>141.8±17.32*</b> |

RMT less weight: 1.27; RMT normal weight:3.12; RMT over weight-obese: 4.86.

HLSB-II: Healthy Life Style Behavior Scale-II; SD: Standard deviation; RMT: Repeated measurements test; \*p<0.001.

**TABLE 5:** Change of body mass index means of intervention and control group students.

| Groups                        | Before    | After     |
|-------------------------------|-----------|-----------|
|                               | BMI       | BMI       |
|                               | Mean±SD   | Mean±SD   |
| Intervention group<br>(n=100) | 1.95±0.53 | 1.90±0.48 |
| Control group<br>(n=94)       | 1.90±0.52 | 1.89±0.47 |

RMT: 1.17; p=0.786

SD: Standard deviation; BMI: Body mass index; RMT: Repeated measurements test.

In the over weight-obese students, all subscale and total scores were found to be significantly higher six months after in intervention groups than control groups ( $p=0.001$ ), except spiritualism and stress management subscales ( $p>0.05$ ). There was no significant increase in the score averages from other subscale of HLSB-II between control and intervention group students ( $p>0.05$ ) (Table 4).

When BMI averages were evaluated six months after intervention, the change in intervention and control group students was not significant (Table 5).

## DISCUSSION

Adolescents are one of the most important target groups in the acquisition of healthy life-related behaviors. However, there are very limited number of experimental studies conducted with video and documentary evaluation of healthy lifestyle behaviors.

In the intervention group, nutrition and stress management, the HLSB-II total scores of males and females repeated 6 months after the intervention were found to be significantly higher in intervention groups than the control group. Studies conducted in the three eastern provinces of Turkey between 2016-2018 found that there was no significant difference between the HLSB-II score averages of girls and boys.<sup>22-24</sup> The findings of this study show that educational videos and films have similar positive effects on both gender.

While after the intervention, in the intervention group, nutrition, health responsibility, and HLSB-II total scores have increased significantly especially in the 11<sup>th</sup> and 12<sup>th</sup> grades compared to control group. Health-related behavior is associated with individual beliefs, expectations, values, perceptions, cognitive factors, personal characteristics, emotional states, habits, and actions that maintain, restructure, and promote health-all of which are important factors in the protection, regulation, and promotion of the individual's health.<sup>25</sup>

Kulakci & Emiroğlu found that nursing interventions related to health teaching, guidance and counseling significantly increased participants' healthy lifestyle behaviors as well as all of its sub-dimensions by the first periodic follow-up.<sup>26</sup> Stress management, health responsibility and total HLSB-II scores of intervention group were found to be significantly higher 6 months after intervention in grade

11. There is no significant difference among other HLSB-II score averages measured at the beginning and after the study among control group of grade 11 students ( $p>0.05$ ). In tenth grade students, there is no significant difference between HLSB-II score averages for control and intervention groups ( $p>0.05$ ). In their study in Diyarbakir in 2017, Sen et al. did not find a significant difference between HLSB-II score averages of high school students.<sup>23</sup> Shah et al. in contrast to this study, found that post-educational knowledge levels of students in India increased more in the lower grades.<sup>25</sup> In the intervention group compared to the control group, HLSB-II stress management and health responsibility subscale score means were significantly increased in eleventh and twelfth grade.<sup>27</sup> Furthermore, in twelfth grades, HLSB-II subscale score means of nutrition, physical activity, stress management and health responsibility increased significantly. In tenth grade, however, there was no significant difference between the intervention and control groups of the HLSB-II subscales.

Similar to this study, Dizaji et al. in their study in Tehran, Iran, didn't find a significant correlation between BMI, knowledge, attitude and behavior scores, activation factors, and pre-and post-intervention empowering factors.<sup>28</sup>

In accordance with this study Swallen et al. Found that overweight and obesity were still significantly predictive only of general health and functional limitations. Underweight adolescents remained significantly more likely to be functionally limited. In this study, video and educational films of adolescent students provided an increase in the Subscale Score Means of HLSB-II of over weight-obese and normal students, respectively, while Underweight students did not increase the subscale score means of HLSB-II. This findings shows that adolescents are more interested in and benefit from video and educational films about their problems.<sup>29</sup>

In this study, there was no significant difference in BMI between the experimental and control groups as a result of the six-month follow-up. This shows that although short film screenings alone have improved students' HLSB-II total scores and some subscale scores, it is not enough to achieve concrete

results such as weight reduction, it may be suggested to add support such as brochures, training etc. Swift et al. In the United States, showed students only film on preventing stigma in obesity and found it effective.<sup>30</sup> According to our findings and Swift et al., when the findings of the film are evaluated together, the effectiveness of film screening will be of maximum benefit by selecting appropriate subjects and targeting gender, grade, risk groups.

## CONCLUSION

Educational documentaries and videos shown in high school students were found to be more effective in male students than in eleventh and twelfth grade students than in tenth grades. Therefore, it is possible to think that the application of education using film and video to eleventh and twelfth grade students may be much more beneficial for the students to develop positive health behaviors.

## LIMITATION OF THE RESEARCH

The fact that feature films were not used due to time constraints constitutes the limitation of this research.

## POSSIBLE IMPLICATIONS FOR CARE

In this study, it is thought that educational documentaries and videos were more effective in developing healthy eating habits and gaining health responsibility in male students. The positive effect of having students watch educational videos and films about physical activity and nutrition in schools has been shown. It was understood that only video or film watching was not enough for female students. Therefore, it may be suggested that activities to motivate female students be included in intervention programs. Healthy eating, physical activity etc. the outcome was found to be more efficient when activities for health-enhancing behavior change were done to eleventh and twelfth graders and to overweight and obese students. For this reason, if there is not enough time to watch videos and movies encouraging students to eat healthy and engage in adequate physical activity, priority should be given to upper classes and overweight and obese students in order to increase their chances of benefiting from these activities.

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During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

All authors contributed equally while this study preparing.

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